THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL
SCHOOL OF SOCIAL WORK

COURSE NUMBER: SOWO 914
TITLE, SEMESTER AND YEAR: Measurement in Intervention Research, Fall 2013

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OFFICE HOURS: Thursday 1:00 to 2:00 or by appointment

COURSE DESCRIPTION:
This course focuses on the development of knowledge and skill in measuring social, psychological, environmental, and other factors related to intervention with individuals, families, groups, and organizations.

COURSE OBJECTIVES (SUBJECT TO APPROVAL OF RELEVANT FACULTY COMMITTEES):
Upon completion of the course, students should be able to:

1. Describe the theoretical, conceptual, and methodological foundations of qualitative and quantitative measurement;
2. Develop and test theory-based scales, starting from a theoretically and empirically justified item pool;
3. Conduct cognitive testing of potential scale items with representatives of an appropriate target audience and analyze the data;
4. Conduct exploratory factor analysis using one or more basic statistics programs to identify and evaluate the factor structure of scales;
5. Conduct confirmatory factor analysis to further support the validity of scales, and understand the implications of data characteristics on the choice of software and analysis strategies;
6. Evaluate the reliability and validity of quantitative indices and scales;
7. Apply principles of measurement to research that involves issues of difference arising from culture, ethnicity, language, race, religion, sexual orientation, and other aspects of human diversity.

EXPANDED DESCRIPTION:
Research is possible only to the extent that concepts can be measured. If we cannot measure something, we cannot draw conclusions about how often it occurs, what conditions are antecedent to it, what factors covary with it, and so on. In that regard, some concepts are easy to measure. Age and education are often measured in years. Income is measured in dollars and
school performance is measured by GPA. Some concepts, however, are harder to measure.
“Practice wisdom,” for example, is widely acknowledged as a concept that discriminates more
successful social workers from less successful social workers. What is practice wisdom? How
do we conceptualize and measure it?

For this course, measurement will be defined broadly. It is *the craft of systematically describing
something that exists*. The course will focus on one qualitative scale development step and then
a sequence of quantitative steps can be used together to develop high quality measures. Course
activities are designed to build both knowledge and skill. Consequently, students will be
expected to engage in a variety of applied learning experiences.

The issues that we will address are at the heart of intervention research. How, for example, do we
measure child abuse, delinquency, client-worker relationships, skills, feelings, attachment, and
other important concepts in the profession? Most people would agree that these exist, but they
are constructs that are not easily operationalized.

The goal if the course is to strengthen your skills in a mixed methods process of developing
quantitative measures of constructs common to social work research. Readings and discussion
will focus on the theoretical and conceptual foundations of quantitative measurement. Students
will be expected to take a leadership role in the course—bringing to class meetings knowledge
from outside readings and experiences, and asking and helping to answer questions related to
course topics that further the growth of all class participants.

**Required Texts/Readings:**
CA: Sage Publications.

Most course readings will be journal articles and book chapters that are available through the
course Sakai site or electronic journals. Students are encouraged to identify on their own articles
in their areas of interest that report on the techniques studied in class.

**Recommended Texts:**
applications*. Charlotte, NC: Information Age Publishing.
Oaks, Sage Publications.
Presser, S., Rothgeb, J. M., Couper, M. P. (Eds.). *Methods for testing and evaluating survey
Thompson, B. (Ed.). (2003). *Score reliability: Contemporary thinking on reliability issues*
TEACHING METHODS:
We will be implementing team-based learning (TBL), or “flipping the classroom” in this course. With this approach, you will learn concepts and skills more thoroughly by applying them extensively during class time. We will not spend time simply reviewing reading material. Instead you will work in teams to explore, challenge, and apply course content. Your attendance, preparation, and participation will be mandatory for the success of the course. In return, I promise to do my best to make the course a rich and rewarding learning experience for you.

ATTENDANCE AND CLASS ASSIGNMENTS:
Attendance. Students are expected to attend all class meetings, complete assigned and independent readings, and contribute to the development of a positive learning environment in the seminar. We have only 13 class meeting times. Students who miss 2 class meetings (excused and/or unexcused, and including cumulative partial missed classes) may be required to take an Incomplete in the course and to retake either the missed sessions or the entire course the following year before receiving a grade. Students who miss a class are fully responsible for obtaining all missed information and materials from their classmates.

Graded Assignments:  
<table>
<thead>
<tr>
<th>Assignment</th>
<th>Weights</th>
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<tbody>
<tr>
<td>Individual Readiness Assurance Tests (5)</td>
<td>10</td>
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<tr>
<td>Group Readiness Assurance Tests (5)</td>
<td>15</td>
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<tr>
<td>Group Application Activities</td>
<td>30</td>
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<tr>
<td>Peer Evaluations (2)</td>
<td>10</td>
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<tr>
<td>Homeworks (5)</td>
<td>15</td>
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<td>Final</td>
<td>20</td>
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<td>Total</td>
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GRADING SYSTEM
The course uses the standard grading cutoffs.
H = 94-100
P = 80-93
L = 70-79
F = 69 and below

POLICY ON INCOMPLETES AND LATE ASSIGNMENTS
Inadequate preparation for class activities will be reflected in the assessment of those activities.

POLICY ON ACADEMIC DISHONESTY
Original and independent work is absolutely expected. Submitted work must conform to the Honor Code of the University of North Carolina. For information on the UNC-CH Honor Code, including guidance on representing the words, thoughts, and ideas of others, see: http://honor.unc.edu/ Please note that plagiarism is defined in the Instrument of Student Judicial Governance, Section II.B.1 as, “…the deliberate or reckless representation of another's words, thoughts, or ideas as one's own without attribution in connection with submission of academic work, whether graded or otherwise.” In keeping with the UNC Honor Code, if reason exists to
believe that academic dishonesty has occurred, a referral will be made to the Office of the
Student Attorney General for investigation and further action as required. See the School of
Social Work Writing Style Guide (on the School’s Website at the “for current students” link) for
information about plagiarism.

Students must not discuss or work together on homeworks and the final exam. Individual work is
expected to reflect totally independent work. On the other hand, students are encouraged to
consult written and online resources on assignment topics (as long as they don’t post questions
related to their assignments in order to get unauthorized help).

Code of Honor Affirmation. All written products in the course must have a signed Honor Code
statement. Papers without this affirmation will not be accepted. The statement should read as
follows: *I have neither given nor received any unauthorized assistance on this assignment.* In
addition to a pledge of no plagiarism, inclusion of this statement on assignments is interpreted by
the instructor as a pledge that the student has not discussed the assignment with other students
nor worked on it with other students.

**POLICY ON ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES**
Students with disabilities that affect their participation in the course and who wish to have
special accommodations should contact the University’s Disabilities Services and provide
documentation of their disability. Disabilities Services will notify the instructor that the student
has a documented disability and may require accommodations. Students should discuss the
specific accommodations they require (e.g. changes in instructional format, examination format)
directly with the instructor.

**POLICIES ON THE USE OF ELECTRONIC DEVICES IN THE CLASSROOM**
It is recommended that at least one team member bring a laptop to class each week. Use of
electronic devices for non-class related activities during classtime (e.g. checking email, playing
games) is not acceptable.
READINGS AND COURSE OUTLINE

1. **THURSDAY AUGUST 22**
   Introduction to Measurement
   Introduction to Team Based Learning
   Traditional Concepts of Validity

   **READING:** DeVellis, parts of chapter 4 (in class)

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LEARNING UNIT 1: SCALE DEVELOPMENT AND VALIDATION—OVERVIEW

**READINGS DUE THURSDAY AUGUST 29:**


DeVellis. Chapters 1 and 5


*Recommended order of readings:* DeVellis; Bowen, Bowen, & Woolley; Sireci; Bowen

**Think about the following questions while doing the readings for LUI1:**

- What are common problems seen in scale items?
- What similarities and differences do you see in the scale development procedures described in Bowen, Bowen, & Woolley and DeVellis?
- How well would each set of procedures contribute to the three traditional types of validity described by DeVellis and discussed last week in class?
- What major differences are there between the traditional concept of validity as described by DeVellis and discussed last week in class and the treatment of validity by Sireci and Bowen?

2. **THURSDAY AUGUST 29**
   A New View of Validation and What it Means for Scale Development
   Item Pool Development and Evaluation
Readiness Assurance Tests (IRAT1 and GRAT1)  
Application Activity 1: Item pool development  
Application Activity 2: Expert Review and Revisions  

Before next class: Teams send me a table showing the team’s original and revised items

LEARNING UNIT 2: COGNITIVE TESTING [RESPONDENT-RELATED VALIDATION]

READINGS DUE THURSDAY SEPTEMBER 5:  

READINGS DUE THURSDAY SEPTEMBER 12:  

Recommended order of readings for Sept 5: both Woolley’s, Willis, Bowen  
Recommended order of readings for Sept 12: Willis, Bowen, Forsyth  

Think about the following questions while doing the readings for LU2:  
When is it appropriate to use cognitive testing?  
When is it unnecessary or inappropriate to use cognitive testing?  
What are the major features of cognitive testing? What decisions need to be made in planning CT procedures?  
How might cognitive testing with children differ from testing with adults?
What cognitive testing steps would be appropriate for the development of a scale to assess course quality, and how could you justify them with the readings?
What options are there for analyzing CT data?

3. **THURSDAY SEPTEMBER 5**
   Planning for Cognitive Testing

   Readiness Assurance Tests (IRAT2 and GRAT2 on readings due today)
   Application Activity 1: Defining well-functioning items
   Application Activity 2: Develop, justify and provide citations for a set of cognitive testing steps to use in your development of your measure

   Before next class: Team sends me guidelines for good items and proposed CT steps

4. **THURSDAY SEPTEMBER 12**
   Collecting Cognitive Data

   3 Readings are due—Be prepared to discuss the question: Does cognitive testing make a difference?
   Application Activity 1: Collect data from members of other team/Provide data to other team; use audio recording
   Discussion—lessons learned
   Whole group analysis practice

   HW1 due next week (Sept 19): Transcribe one subject’s data and analyze them based on whole-group guidelines discussed in class. Bring copies of your transcription with analysis notes to class for your teammates and for me (individual work).

5. **THURSDAY SEPTEMBER 19**
   Analyzing Cognitive Data

   HW1 due at the beginning of class

   Application Activity 1: Analyze all data and revise items; Report out on findings
   Application Activity 2: Critique other teams’ final items mercilessly

   Before next class: Teams send me the table showing the team’s original and revised items from first round of revision plus a new column with the final items after after revisions due to merciless 2nd round of expert review.
LEARNING UNIT 3: EXPLORATORY FACTOR ANALYSIS [CONTENT-RELATED, INTERNAL STRUCTURE VALIDATION]

READINGS DUE SEPTEMBER 26:
DeVellis, Chapters 2 and 6.
Pett, Lackey, & Sullivan, Chapters 1 and 3.

Recommended order of readings: DeVellis; Pett, Lackey, & Sullivan; Costello & Osborne; Bowen

Think about the following questions while reading:
What is the purpose of exploratory factor analysis? (EFA)
What are the primary methodological choices to be made when conducting an EFA?
What methods can you use to assess the factorability of your data?
What are the evaluation criteria for each of those methods?
What are the primary EFA output components?
How do you evaluate each of the primary EFA output components?
How could you use the readings to support your choice of EFA methods and the evaluation of your EFA results?

READING DUE OCTOBER 3:
One EFA article in your own area of research.

6. THURSDAY SEPTEMBER 26
Latent Variables and Exploratory Factor Analysis

Readiness Assurance Tests (IRAT3 and GRAT3)
Application Activity 1: Evaluating matrices for EFA
Application Activity 2: Testing matrix predictions in the computer lab

HW2 due next week (Oct 3): Critique of EFA methods in article from your area of interest (individual work)
7. **Thursday October 3**
   Best Practices in Exploratory Factor Analysis

   HW2 due at the beginning of class.

   Application Activity 1: Competetion for the Worst EFA article
   Application Activity 2: Interpreting EFA output

   HW3 due next week (Oct 10): Interpreting EFA output on your own (individual work)

8. **Thursday October 10**
   Exploratory Factor Analysis, *continued*

   HW3 due at the beginning of class.

   Running EFAs--instructions
   Application Activity 1: Competitive EFA lab

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**OCTOBER 17  FALL BREAK  NO CLASS**

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**Learning Unit 4: Composites, Reliability [Content-related, Internal Structure Validation] and Validity [Score Performance Validation]**

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**Readings Due October 24:**
Devellis, Chapters 3 and 4
Multiple Trait Multiple Method Matrices
http://www.socialresearchmethods.net/kb/mtmmmat.php

*Recommended order of readings:* Devellis, Thompson, Baugh, website
*Think about the following questions while reading:*
What is measurement reliability? How does it differ from measurement validity?
What different kinds of reliability exist?
What type of reliability is most commonly reported? Why?
What internal consistency reliability cutoff would you use and how would you justify your choice?

How does a MTMM matrice provide evidence for or against the argument of construct validity of scores on an instrument?

9. **Thursday October 24**

Composites, Reliability, and Score Performance Validation

Readiness Assurance Tests (IRAT4 and GRAT4)
Application Activity 1: Comparing EFA and reliability results in computer lab
Application Activity 2: Composites and score correlations—Multiple Trait Multiple Method Matrices

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**Learning Unit 5: Confirmatory Factor Analysis [Content-Related, Internal Structure Validation]**

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**Readings Due October 31:**


One CFA article in your area of interest.

Recommended order of readings: Bowen & Guo, Thompson, Wegmann.

Think about the following questions while reading:

How does confirmatory factor analysis (CFA) differ from EFA in terms of purpose, methods, and evaluation criteria? Which evaluation criteria apply to both methods?

What is the purpose of CFA?

What is model identification (just conceptually)?

What are the primary methodological choices to be made when conducting a CFA?

What are the primary CFA output components?

How do you evaluate each of the primary CFA output components?

How could you use the readings to support your choice of CFA methods and the evaluation of your CFA results?
10. **THURSDAY OCTOBER 31**
   Concepts and Fundamentals of CFA
   
   Readiness Assurance Tests (IRAT5 and GRAT5)
   Brief Lecture—data requirements, measurement error, analysis
   Application Activity 1: CFA Specification and Identification Contest (SIC!)  
   HW4 due next week (Nov 7): Specification and identification practice on you own  
   (individual work)

11. **THURSDAY NOVEMBER 7**
   CFA Modeling and Results
   
   Application Activity 1: Running models in the computer lab  
   Application Activity 2: Interpreting output in the classroom
   
   HW5 due next week (Nov 14): Critique of CFA article in your interest area

12. **THURSDAY NOVEMBER 14**
   Confirmatory Factor Analysis, Best practices and Critiques
   
   HW5 due at the beginning of class.  
   Application Activity 1: CFA worst article competition  
   Application Activity 2: Competitive CFA in the computer lab

13. **THURSDAY NOVEMBER 21**
   Measurement and Validation Wrap up
   
   **READINGS DUE TODAY:**
   
   FINAL EXAM, DUE DATE TBD (individual work)