

## COURSE OUTLINE

### EXRS 7180: Assessing Psychological Constructs of Interest to Exercise Scientists

#### I. Course Information

- A. Location - Room 115 E Ramsey Center
- B. Class Days & Time - T & TH 2 to 3:15

#### II. Instructor Information

- A. Instructor - Patrick J. O'Connor
- B. Office Location - Room 115-L
- C. Office Hours - By appointment
- D. Office Phone - 542-4382

#### III. Primary Objectives

- 1) to learn about the process by which psychological tests are developed,
- 2) to learn acceptable practices for the fair and ethical use of psychological test scores,
- 3) to learn methods for minimizing error and bias in psychological tests,
- 4) to learn the importance of various types of reliability and validity evidence in evaluating the meaning of psychological test scores
- 5) to learn to consider alternative hypotheses about the meaning of psychological test scores,
- 4) to learn the importance of considering the published scientific evidence in evaluating the meaning of psychological test scores

#### IV. Reading Materials

- 1) Paul Kline, *Handbook of Psychological Testing* (2000), Second Edition, Routledge.
- 2) John E. Ware, Jr., 2000, SF-36 Health Survey Manual & Interpretation guide
- 3) Other readings provided by Dr. O'Connor and student peers.

## V. How you should prepare for this class:

To participate in this class you will need to identify a psychological construct of primary interest to you as well as a specific test of that psychological construct. It is expected that you will identify the construct after the first week and the specific test by the end of the third week. During the first part of the course we will be reading and discussing a series of articles designed to provide background information about psychological testing and measurement. During the second part of the course, one week prior to making presentations students will provide a reading associated with each presentation that they make (described below). For every class period it is expected that you will:

- (1) carefully read the assigned readings prior to each class meeting,
- (2) identify any questions that you have about the reading and prioritize them (1=highest, 2=next highest, etc...) in regard to their importance for you understanding the material (e.g., an uncertainty about a single poorly written sentence is not too important in understanding the main point of an article, but uncertainty about a method or a concept is often a complete barrier to understanding the main point being made by the authors).
- (3) identify and prioritize any major concerns that you about the material presented in the article (e.g., was any information inaccurate, were the conclusions drawn by the authors correct, are there potentially important alternative perspectives that the authors ignored).
- (4) indicate and prioritize any comments that you have about the reading material. For example, it may be useful for the class for you to comment on difficulties in applying the material presented in the article to the construct of interest to you.
- (5) actively participate during in-class discussions of each paper

### Evaluation Procedures:

**1. Daily hand-in (50%).** A typed summary of steps 2-4 above will be handed in at the end of each class (we will use your typed comments during class to facilitate discussion). This does not need to be lengthy, the key is that major questions and concerns are identified and prioritized. One letter grade will be deducted for papers that are late.

**2. Presentations (25% total).** Five times during the second half of the course (~ every 1.5 weeks) you will provide information to the class about the specific psychological test of interest to you. Each presentation should be ~20 minutes in length followed by a 15 minute discussion period. One week prior to each presentation you will provide members of the class with a copy of one brief (i.e., non-review) article that you will be discussing in your presentation. The article should be okayed by the instructor first. The following type of information should be presented:

Presentation #1 – a copy of the test with background about the construct and its nomonological network and how the test was constructed

Presentation #2 – a summary of the best available reliability data for your test

Presentation #3 – a summary of the best available validity data for your test

Presentation #4 – a summary of the next best available validity data for your test

Presentation #5 – a summary of the strongest evidence for the invalidity of your test

The information for presentations 2-5 should come from published data (preferably experiments).

**3. Paper evaluating a test (20%).** Students will select a construct of interest (e.g., Type A behavior, self-esteem, etc...), attempt to find the best test for measuring that construct, and then write a paper evaluating the properties of the test. This evaluation should include the following sections: *Background* (in which the rationale for the test and the theory in which it is grounded is briefly summarized), *Description and Construction* (in which the test items and the procedures used to construct the test are described), *Validity Evidence* (in which the results of the most critical published research investigations for interpreting what the test scores mean are summarized), *Conclusion* (a paragraph in which you briefly summarize what the test scores measure), and *Future Research* (in which you identify future research needs with regards to the instrument). For established tests the *Validity Evidence* section is the most important and should be the longest and most compelling. For well established tests you will need to use the available published research to rule out various alternative explanations concerning what the test scores mean. Ideally, your job is to find all of the published research that has used the test, read and evaluate this body of research, and then summarize in the *Validity Evidence* section those key investigations that shed the most light on what the test scores mean. For less well established tests the *Future Research* section will be the most important because in it you will be able to demonstrate how much you have learned by outlining the key experiments necessary to show in a convincing way that the test is measuring what it is supposed to measure.

**4. Participation in class discussions (5%).** The class will be a seminar format in which we discuss the readings and/or presentations. I will judge your understanding of the material covered based on the number and nature of your in-class comments. The most credit is given to those who consistently raise thought provoking questions as well as those who have compelling answers to questions raised by others. Especially desirable will be appropriate application of material covered at the beginning of the semester to readings discussed later in the semester.

**Reading to be discussed -**

Tue Jan 8	Intro to the course – no reading
Th Jan 10	Chapter 1 on reliability of tests
T Jan 15	Chapter 3 on test error and Hopkins on measures of reliability in sports medicine
Th Jan 17	Baranowski et al and Lynch et al on reliability of physical activity
T Jan 22	Chapter 2 on validity and Chronbach and Meehl
Th Jan 24	Landy on stamp collecting versus science
T Jan 29	Chapter 4 on standardizing the test
Th Jan 31	Chapter 5 on Rasch scaling
T Feb 5	Chapter 6 on computerized and tailored testing
Th Feb 7	Chapter 7 on factor analysis
T Feb 12	Chapter 8 on factor analysis
Th Feb 14	Chapter 9 on test construction
T Feb 19	Chapter 10 on test construction
Th Feb 21	Chapters 2 through 6 of SF 36 manual
T Feb 26	Chapters 7 through 12 of SF 36 manual
Th Feb 28	Read Hoyle et al. on structural equation modeling
T Mar 4	Speaker 1 _____ Speaker 2 _____
Th Mar 6	Speaker 3 _____ Speaker 4 _____

**MARCH 10 TO 14 SPRING BREAK - NO CLASS**

T Mar 18	Speaker 5 _____	
Th Mar 20	Speaker 1 _____	Speaker 2 _____
T Mar 25	Speaker 3 _____	Speaker 4 _____
Th Mar 27	Speaker 5 _____	
T April 1	Speaker 1 _____	Speaker 2 _____
Th Apr 3	Speaker 3 _____	Speaker 4 _____
T Apr 8	Speaker 5 _____	
Th Apr 10	Speaker 1 _____	Speaker 2 _____
T Apr 15	Speaker 3 _____	Speaker 4 _____
Th Apr 17	Speaker 5 _____	Speaker 1 _____
T Apr 22	Speaker 2 _____	Speaker 3 _____
Th Apr 24	Speaker 4 _____	Speaker 5 _____

## **Pre-Course Information for the Instructor**

Name \_\_\_\_\_

1. List the primary topics covered in the graduate statistics courses that you have taken:
2. Distinguish between research design and statistics.
3. List three types of reliability.
4. List three types of validity.
5. What is meant by the term “multitrait-multimethod matrix”?
6. What is factor analysis?
7. What is structural equation modeling?
8. What is Item Response Theory?