

9-2014

## PSYX 524.01: Tests and Measurement

Jacqueline A. Brown

*University of Montana - Missoula*, [jacqueline.brown@umontana.edu](mailto:jacqueline.brown@umontana.edu)

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# **PSYX 524: Tests & Measurement**

## **Fall 2014**

### **Course location and time**

Skaggs 303

Monday 11:10 am – 2:00 pm

### **Instructor information**

Instructor: Jacqueline A. Brown, Ph.D., NCSP

Office: Skaggs 204

Email: Jacqueline.Brown@umontana.edu

Phone: 406-243-6883

Office hours: By appointment (send me an email to set up)

### **Course description**

This course provides an introduction to educational and psychological measurement. Through lectures, discussion, and individual and group activities, students will learn about the basic concepts, competencies, issues, and tools used in psychological testing and measurement and their practical applications. Specifically, we will review three main areas: 1) theory and principles (e.g., statistical foundations, reliability, validity, item analysis), 2) applications and issues (e.g., test construction and evaluation), and 3) practical elements (e.g., test use in educational and clinical settings). At the conclusion of this course, students will be more knowledgeable about psychological tests and an informed consumer.

### **Learning Outcomes**

At the conclusion of this course, students will be able to:

1. understand some of the history and context surrounding measurement and testing
2. interpret basic statistics used to establish properties of test scores, e.g., measures of central tendency and variability, reliability and validity, and interpreting correlation coefficients
3. interpret test scores, e.g., standard scores, percentile ranks, z-scores, T-scores, age and grade norms, and stanines
4. discuss current assessment tools for measuring achievement, cognition, behavior, and social-emotional functioning
5. know what to consider when constructing, administering, and evaluating tests and surveys
6. relate the quality of measurement to the interpretation of findings and decision-making and communicate the meaning of test scores to students, parents, and educational personnel
7. use assessment information in an ethical and legal manner
8. discuss assessment of students who speak English as a second language

## **NASP Domains of Practice**

- Domain 1: Data-Based Decision Making and Accountability  
Domain 8: Diversity in Development and Learning  
Domain 9: Research and Program Evaluation  
Domain 10: Legal, Ethical, and Professional Practice

## **Corresponding Program Competencies and Objectives**

### **Psychometrics, Measurement, and Research**

Students will learn to evaluate test and survey instruments for psychometric properties.  
Students will learn to evaluate and utilize research to inform and guide professional practice.

### **Professional School Psychology**

Students will learn to have an understanding of, and ability to practice within legal and ethical responsibilities related to the provision of school psychological services.  
Students will have an understanding and awareness of multicultural issues and their impact on student performance as well as the school psychologist-client relationship.  
Students will learn to understand the need for cultural competence and awareness.

### **Required textbooks**

Miller, L. A., Lovler, B., & McIntire, S. (2013). *Foundations of psychological testing: A practical approach* (4th ed.). Thousand Oaks, CA: Sage.

\*Thomas, A. & Harrison, P. (Eds.). (2014). *Best practices in school psychology VI* (6th ed.). Bethesda, MD: National Association of School Psychologists.

\*The 6<sup>th</sup> edition of Best Practices in School Psychology will be released in September, so please order it when it becomes available. This will be a valuable resource for all your courses and applied work in school psychology.

### **Additional readings**

The following readings will be available to you in PDF format on Moodle. There may be additional readings assigned during the semester, but you will be provided with them in advance.

Blatchely, L. A., & Lau, M. Y. (2010). Culturally competent assessment of English Language Learners for special education services. Bethesda, MD: National Association of School Psychologists. Retrieved from [NASP online](#).

Demmert, W. G. (2005). The influences of culture on learning and assessment among Native American students. *Learning Disabilities Research & Practice, 20*, 16-23. doi: 10.1111/j.1540-5826.2005.00116.x

Mash, E. J., & Hunsley, J. (2005). Evidence-based assessment of child and adolescent disorders: Issues and challenges. *Journal of Clinical Child and Adolescent Psychology, 34*, 362-379. doi: 10.1207/s15374424jccp3403\_1

National Association of School Psychologists (2009). *School Psychologists' involvement in assessment (Position Statement)*. Bethesda, MD: Author.

Penfield, R. D. (2010). Test-based Retention: Does it stand up to professional standards for fair and appropriate test use? *Educational Researcher*, 39, 110-119. doi: 10.3102/0013189X10363007

Turner, S. M., DeMers, S. T., Fox, H. R., & Reed, G. M. (2001). APA's guidelines for test user qualifications. *American Psychologist*, 56, 1099-1113. doi: 10.1037//0003-066X.56.12.1099

### **Required assignments**

All written assignments must be completed according to proper APA format.

1. **Class discussion and participation (10 points)**  
Participation in class assignments, activities, discussion, and readings is critical for learning in this course. I expect that you will come to class having read all of the required readings. We will be discussing readings during class and it is expected that you will actively engage in these discussions. To facilitate the discussion, you are expected to come up with one or more questions related to the readings during each lecture.
2. **Reflection Paper (10 points)**  
You will write a brief (3 page) paper reflecting upon the topic of measurement and its role in your life and profession. You may choose to reflect upon a variety of issues such as your personal experience with standardized testing, the relevant strengths and weaknesses of measurement, and factors influencing testing results. I encourage you to be as creative as possible in your reflection.
3. **Assessment Construction Group Project (40 points)**  
In groups, you will develop an assessment (e.g., survey or test) that measures a particular construct. You will present the results of the assessment at the end of the semester. Each student will receive a group grade (30 points) and an individual grade (10 points). Each member of the group will evaluate the other members on timeliness, work ethic, and overall contribution to the group. Detailed information is provided in Appendix A.
4. **Final Paper (40 points)**  
You will complete a final paper comparing the psychometric properties of two tests and evaluating their overall utility. You will need to have the tests you are comparing approved by me before starting your paper. Detailed information is provided in Appendix B.

## Course grading

Grades are determined based on straight percentages and are as follows:

Percentage	Grade
94 – 100	A
90 – 93	A-
87 – 89	B+
84 – 86	B
80 – 83	B-
77 – 79	C+
74 – 76	C
70 – 73	C-
67 – 69	D+
64 – 66	D
60 – 63	D-
0 – 59	F

## Course guidelines and policies

### **Student Conduct Code**

Students entering the field of school psychology are held to a high standard of academic and professional honesty and integrity. The University of Montana Student Conduct Code (SCC) should be reviewed, especially in regards to plagiarism. It is the policy of the SPSY program that plagiarism will result in an “F” for the course in which the academic violation occurs, as well as grounds for consideration of dismissal from the program. The UM administration states: “All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University.” All students need to be familiar with the *Student Conduct Code*. *Please take care to acknowledge your sources, including the Internet, using APA Style.*

### **Attendance**

Regular attendance and active engagement is required for all scheduled classes, as students are responsible for information covered in lectures, handouts, discussions, and activities. Attendance is stressed because students will have opportunities to (a) improve their knowledge through discussions of critical topics and issues, (b) practice skills needed to engage in professional communication with colleagues, (c) obtain information from lectures and presentations, (d) participate in activities, and (e) submit required assignments.

Please inform me prior to class if a late arrival or early departure from class is absolutely necessary. In the case of illness or absence (including religious observances), please send me an email and make arrangements before missing the class. For extended absences due to medical issues, documentation must be provided. Failure to do so may result in penalty. Absence for conferences is not automatically excused. You must be in good standing in the class and make arrangements for assignments before you leave.

### **Electronic Devices**

All electronic devices other than computers must be turned off and put away before class. The use of computers during class to take notes or use electronic articles and PowerPoint

presentations is allowed. However, students may not use any form of social media on their computer while in class or use computers for other personal reasons unrelated to the class content. I will speak to you if I feel your use of computers is interfering with your learning or is a distraction to other students. Inappropriate use of computers will result in a reduction in your participation grade in this course.

### **Respect for Diversity and Appropriate Language**

I am committed to fostering a class environment in which all people will be treated and will be expected to treat others respectfully. People with disabilities or other elements of diversity are first and foremost individual people who should be treated with respect. Language used in assignments and class discussions should be respectful and professional at all times. Please use **“people first”** language in speaking and writing about people with disabilities or other elements of diversity. For example, please avoid phrases such as “the handicapped,” “LD kid,” “autistic child” or other statements that emphasize the disability or other elements of diversity first, rather than the individual. Pejorative terms and threatening or harassing language have no place in a respectful professional discussion or in your assignments.

### **Disability Modifications**

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and [Disability Services for Students](#). If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or call 406.243.2243. I will work with you and Disability Services to provide an appropriate modification.

### **Assignment expectations**

Students are expected to submit assignments at or before the assigned due date (no later than the end of class). Prior notification is required for excused or late assignments. Unexcused assignments submitted after the due date will be penalized by a reduction of **five points per calendar day** late. It is the student’s responsibility to ask questions when information required in the assignments or discussed in class is unclear. There will be no make-up or extra-credit assignments.

The instructor reserves the right to modify or substitute coursework, including readings and assignments, during the course to enhance learning. These changes will not result in a substantially increased workload or decreased opportunities to earn points, but will instead likely benefit students.

## Course Schedule

The course schedule is subject to minor adjustments, as determined by the instructor.

Date	Topics	Required Readings	Assignment
August 25	Introductions and Course Syllabus Overview of Psychological Testing	Miller, Lovler, & McIntire Chapter 1	
September 1	Labor Day—NO CLASS		
September 8	Importance and Applicability of Psychological Testing	Miller, Lovler, & McIntire Chapter 2 & 4  NASP (2009) Position Statement	
September 15	Psychological Test Use Ethical & Legal Considerations	Miller, Lovler, & McIntire Chapter 3  Turner et al. (2001)	<b>Reflection Paper Due</b>
September 22	Interpreting Test Scores	Miller, Lovler, & McIntire Chapter 5	<b>Assessment Construction Project Topic Due</b>
September 29	Test Reliability	Miller, Lovler, & McIntire Chapter 6	
October 6	Test Validity	Miller, Lovler, & McIntire Chapter 7 & 8	
October 13	Test Validity and Factor Analysis	Miller, Lovler, & McIntire Chapter 9	<b>Final Paper Topic Due</b>
October 20	Test Construction and Administration <i>Work on Assessment Construction Project</i>	Miller, Lovler, & McIntire Chapter 10 & 11	
October 27	Assessing the Psychometric Quality of a Test	Miller, Lovler, & McIntire Chapter 12	
November 3	Issues of Culture in Testing and Assessment	Blatchely & Lau (2010)  Demmert (2005)  Best Practices in School Psychology VI, Foundations Ch. 5 (p. 61)	
November 10	Material Review  <i>Work on Assessment Construction Project</i>	None Assigned	<b>Complete Review Worksheet (in class assignment)</b>

Date	Topics	Required Readings	Assignment
November 17	Using Tests in School and Applied Psychology: Overview	Miller, Lovler, & McIntire Chapter 13 & 14  Penfield (2010)  Mash & Hunsley (2005)	
November 24	Using Tests in School and Applied Psychology: Specific Disorders	Best Practices in School Psychology VI, Data-Based and Collaborative Decision Making  Ch. 25 (p. 391) AND Ch. 27 (p. 417)	
December 1	<b>Assessment Construction Project Presentations</b>	None Assigned	<b>Assessment Construction Project Report Due</b>
December 8	No Class (Final Exams Week)		<b>Final Paper Due</b> (by 4 pm)



## Appendix A:

### Assessment Construction Group Project

One of the best ways of understanding assessment and psychometrics is to create an assessment. The purpose of this project is to work collaboratively with your colleagues in creating a short assessment of a particular construct.

You will have some time in class to complete the project, but the majority of the work should be done outside of class.

Working in small groups, you will:

1. **Choose a construct to measure.**

As a group, determine what construct you would like to assess. You may choose to measure achievement, aptitude or personality. Remember, simple is sometimes better! You must have my approval prior to beginning the project.

2. **Research the construct and its measurement.**

As a group, conduct a thorough examination of how this construct has been measured in the past. For example, if you are examining self-esteem, you should look carefully at how “self-esteem” has been conceptualized and measured. In your presentation, you will need to present the history of the construct, the assessments available, and then provide an analysis and critique of these assessments.

3. **Develop an item pool.**

Once you have researched the construct, develop a pool of potential items that could measure that construct (approximately 20-25 should be sufficient). As a group, discuss whether these items adequately measure the construct.

Questions you should ask are:

- What should you do about redundant or ambiguous items?
- How many items should be in the final scale?
- What is the appropriate number of judges or raters for the preliminary items?
- What specific formula should you use for estimating reliability?
- How does the theory of test construction relate to the measurement of the construct?

4. **Collect data and perform analyses.**

Give your assessment to a group of volunteers (other graduate or undergraduate students). Each team member should be responsible for administering a set of surveys. Analyze the results of the assessment and conduct some item analyses, as appropriate. Calculate the scale reliability and discuss issues of test bias, response bias, and validity.

5. **Present your project.**

As a team, you will present the project to the rest of the class. You will have approximately 20 minutes to share your project. Each report should include a Method

section that described the sample of raters or judges used to develop the scale, the materials used, and the procedure used to collect the ratings or judgments. Include all statistical analyses that were used to construct the scale. In general, the report should follow this format:

- The objective of the assessment
- History and explanation of the construct and assessment of the construct
- An explanation of why the particular method of scale construction was chosen
- Final items selected for the scale with an explanation of the criteria used by the team for item inclusion
- Reliability information
- Suggestions for next steps to determine reliability and validity of scale

As a group, you will be evaluated on several criteria:

- Comprehensive summary of construct and history of assessment of construct
- Appropriateness of items
- Appropriate use of statistical analyses
- Depth of discussion on reliability, validity, test and response bias
- Incorporation of all team members in presentation
- Use of visual aides and examples
- Clarity and organization of presentation

Each team member will also be evaluated by other team members. You will be evaluated on the following criteria:

- Attendance at team meetings
- Timeliness in completing tasks
- Overall work ethic
- Overall contribution to the team

## Appendix B:

### Final Paper

The main purpose of this research report is to evaluate two measures of a construct and select the best one. This assignment is designed to examine how well you can apply the knowledge you have acquired about basic principles of measurement to this task. Select a construct and two measures of that construct. You are required to receive approval on your tests and construct before proceeding.

Papers must be *no more than 10 pages, double-spaced*, using **1-inch margins**.

You are expected to obtain information from a variety of sources, such as test manuals, journal articles, PSYC INFO and/or Google Scholar, books, and reference guides. These sources need to be appropriately cited using APA style (6<sup>th</sup> edition).

Please address the following sections and questions in your paper:

1. *Scenario:*

What is your construct of interest and the two measures you will be comparing? Provide a *brief* scenario (maximum of five sentences) for which you need this measure. Include in the scenario your sample, context, and the reason for measuring the construct.

Once you have selected your tests, you should supply the following information for *each* test. Specific questions to address under each section are listed in Appendix B (p. 549) "Guidelines for Critiquing a Psychological Test" in the Miller, Lovler, & McIntire (2013) course textbook.

2. *General Descriptive Information (5 points)*

Please address all the questions listed in Appendix B, ***except for*** "Is the test proprietary or nonproprietary?"

3. *Purpose and Nature of the Test (5 points)*

Please address all the questions listed in Appendix B, ***except for*** "What behavior does the test require the test taker to perform?"

4. *Practical Evaluation (7 points)*

Please address all the questions listed in Appendix B.

5. *Technical Evaluation (15 points)*

Please address all the questions listed in Appendix B.

6. *Summary Comments (5 points)*

Give a summary statement of the design and content of each test, including with whom each test is designed to be used. Comment briefly on the adequacy of the test as a measure of what it was designed to measure. Based on the information previously provided in your paper, what do you see as being the strengths and weaknesses of each

test? What further information and/or data are needed to improve the test and its uses? (*Note: This is a summary. All key information – and no new information – should be provided here*).

7. *Recommendation (3 points)*

What is your recommendation as to which test you should use? Please give a strong rationale for your recommendation. You may wish to tie this section back to your scenario if applicable.

### **Suggestions for Constructs and Measures**

Below are possible suggestions of constructs and measures to use in your paper. These are merely examples and not mandatory. Feel free to choose another construct/measure that may be of interest to you.

#### **Cognition**

Wechsler Intelligence Scales for Children (4<sup>th</sup> edition); Stanford-Binet Intelligence Scale (5<sup>th</sup> edition); Woodcock-Johnson Tests of Cognitive Abilities; Kaufman Assessment Battery for Children

#### **Achievement:**

Wechsler Individual Achievement Test; Woodcock Johnson Tests of Achievement; Kaufman Test of Educational Achievement

#### **Depression:**

Beck Depression Inventory for Youth; Reynolds Child/Adolescent Depression Scales; Child Depression Inventory

#### **Anxiety:**

State-Trait Anxiety Inventory for Children; Beck Anxiety Inventory for Youth; Revised Children Manifest Anxiety Scale

#### **Self-Esteem**

Coopersmith Self-Esteem Inventory; Rosenberg Self-Esteem Scale

#### **Self-Concept**

Piers-Harris Children's Self-Concept Scale; Tennessee Self-Concept Scale; Self-Description Questionnaire