

PSY 470/570 psychometrics and Psychological Testing

TERM: Fall 2002 September 30th to December 6th

TIME & LOCATIONS: MWF Fri 9:00-9:50 @ MORE 130

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OVERVIEW

The course examines theory and practice of psychological testing using two complementary ways of learning: the lectures and projects. The lecture part of the course examines the following topics: theories underlying psychological testing, test development and design, methods for evaluation of psychological tests, interpretation and use of test scores, and widely used psychological tests (WAIS, WMS, etc.). The practical part of the course teaches you how to design and evaluate psychological tests, how to write a psychological research report evaluating testing instruments, and how to present your results in a brief conference-style presentation, and

To evaluate psychological tests, we will use SPSS for Windows. It is assumed that you are either knowledgeable about using SPSS from taking required prerequisites or that you are willing to learn SPSS quickly and efficiently on your own, although we will cover basics in class.

Because this is a Writing Intensive Course (WIC) course, a large part of your grade is based on your final written research report. PSY 470 is 4 credit course, and thus, you should expect to spend more time on this course than on your regular 3 credit courses, more time than on any other non-WIC courses. The OSU assumes that you spend at least 2 hours on your homework and study each week for each credit hour. Therefore, you can assume that your homework including reading will take 8 hours/week averaged across the term.

PRIMARY OBJECTIVES

- To provide you with an opportunity to familiarize yourself with theory and practice of psychological testing
- To provide you with an opportunity to learn how to evaluate psychological tests
- To provide you with an opportunity to learn how to interpret and properly used test scores
- To provide you with an opportunity to learn how to write APA style research report
- To give you an opportunity to get experience with creating a conference-style research based presentation to your classmates in form of a poster or a talk
- To provide you with an opportunity to learn how to design a psychological test

WHAT IS THIS COURSE GOOD FOR?

- It may help you become a more educated, quantitative information savvy person. For example, you will be able to answer the following questions and discuss the related issues:
 - What does it mean if you get 74% on one of the PSY470/570 test and your friend gets 80%? Was your friend's grasp of the material better than yours?
 - What does it mean if your child is tested in the 4th grade and receives an IQ score of 95? What does it mean if he or she is tested on your school's achievement test and gets a score of 30?
 - What does it mean if your job performance rating is 3.22 on 0 to 4 Likert scale (i.e., scale ranging from 0=Strongly Disagree to 4=Strongly Agree) and the average performance ratings of your colleagues is 3.25? Is your performance unsatisfactory, satisfactory, good, very good or excellent? Is your performance worse than that of your colleagues?
 - You have just failed a common drug test and, as a result, have been fired from your job of 10 years. Suddenly you are a criminal, drug junkie, and generally unfavorably looked upon person... Or are you? Is it possible that the drug test result was an error? How likely is it?
 - The test publisher says their test is reliable, valid, and normed on a large comprehensive sample of people. More than 80% of all clinicians use it. Will you be comfortable using this test? How can you tell whether the test is really valid, reliable and adequately normed? What do you have to look for to establish usefulness of the test for a task at hand?
 - What are implications of various public policies based on psychological testing? Should SATs, GREs, and other tests be abolished? Can we replace them with something better? Is professional judgment better than decisions based on standardized tests?
 - Are IQ tests biased? How can you evaluate whether a test is biased? Is it a matter of opinion or is it a matter of an empirical test?
- It gives you 4 credits towards your graduation and completes your WIC requirement.
- It may help you land a lucrative job as a psychometrician, assessment technician or data analyst in private industry or government agencies. It may help you get a lucrative job in industrial/organizational or applied psychology field with various private and government companies in need of, for example, consumer & marketing research.
- It will give you "hard" course credits looked upon favorably by graduate school admission committees and your potential graduate advisors.

PREREQUISITES

PSY 301 and either PSY340, PSY370, or PSY380. If you do not have these prerequisites, you may be disenrolled from the course unless you obtain my permission to enroll or to remain in this course (see Academic Regulations). Recall that PSY 301 has as prerequisites PSY 201, 202; ST 211 or ST 351. Thus, it is assumed that you have working knowledge of basic statistics, that you are familiar with and understand terms such as means, standard deviation, correlation, regression, one-sample and two sample t-test, p-value, etc.. Many of these terms will be reviewed in class. However, you are ultimately responsible for investing any extra time and effort required to refresh your knowledge of statistics and research methods covered in prerequisites if you have forgotten all about them.

INSTRUCTIONAL METHODS

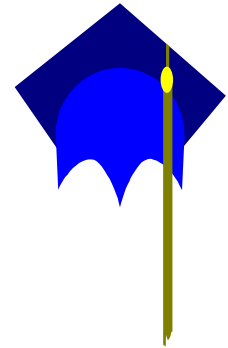
We will use several complementary instructional methods: readings, lectures, labs, assignments, papers, presentations, & discussions. The readings and lectures are efficient means of communicating basic knowledge. The labs, assignments, papers, conference style presentations, and discussions give you first hand experience with psychometrics and psychological testing as well as the opportunity to try-out your understanding of the material covered in the readings and lectures.

EVALUATION

Your work in PSY470 will be formally evaluated by means of:

APA STYLE RESEARCH PAPER (2,500-3,500 words, graded; 35% course

grade) The main objective of the paper is to critically evaluate a psychometric properties of a test. This will involve (1) conducting a literature search for the original research reports on the psychometric properties of the test and/or closely related tests and (2) using a data set to evaluate the psychometric properties of the test. I expect the research paper to conform ALL requirements of APA style manual. A good example is provided in APA style manual itself. Additional examples will be provided on my web site.



The 1st draft of each section (title page, introduction, method, results, discussion; 5% of your final course grade) The drafts will be graded on PASS/FAIL basis; for each section draft, a FAIL = 0% and PASS = 1% of your final course grade, with cumulative total for the 1st drafts ranging from 0 to 5% of your final course grade. PASS is for handing in a specific section. FAIL is for failure to hand in a specific section and/or for a failure to show serious effort and progress on the section.

Final, polished paper (graded; 30% of your final course grade)

CONFERENCE STYLE PRESENTATION (talk + overheads + presentation; 10% course grade) The purpose of the presentation is to learn to present your findings to your colleagues in an effective and understandable way, and to be able to answer your colleagues' questions effectively. After your presentation, you have to hand in your overheads (you can pick them up from me later). Your grade for each presentation will be determined equally by quality of your overheads, by your in-class presentation and by your ability to answer your peer's questions. Your peers will grade and evaluate your presentation (I reserve the right to override their grading, although I have rarely done so.) If class size will not allow individual presentations, I may require you to do conference style poster instead. The posters will be graded by your peers on the quality of the poster (content + visuals + questions; 10% course grade).

BI -WEEKLY TESTS (non-cumulative; graded; best 3 count, 10% each; 30% course grade) Tests will be only multiple choice tests. Each test will be 20 minutes long and have between 20 to 25 MC questions.

READING, LABS, & PARTICIPATION ASSESSMENTS (25% course grade) Take home assignments and labs will be used to assess your reading, labs and participation. For each assignment, you will be asked to answer questions about your readings and/or discuss specific issues (as a guide, each answer will be about a paragraph long). You have to have

your answers ready on a due date and be ready to hand them in. I will grade only some of these reading assignments on a PASS=1/FAIL=0 basis. Two absences/failures to read will be automatically excused. Because these assignments serve as a measure of your attendance, you must hand them in in class.

The labs have to be handed in by 5:00PM on the day of the labs. It will be graded on a PASS=1/FAIL=0 basis. Two absences/failures to hand the labs in will be automatically excused.

EXTRA CREDITS (up to 5% course grade) You can earn up to 5% course grade extra credits in Assignments and Media Credits.

ALTERNATIVE EVALUATION OPTIONS

The alternative evaluation options are for students who are very interested in Psychometrics and Psychological Testing, for students who want to pursue graduate studies in psychology or for students who want to become psychometricians or to pursue applied careers in industry requiring in-depth knowledge of psychometrics. The options allow you to get hands-on experience not only with test evaluation but also with other aspects of a test production: the test design and pilot testing of the test. I have to give you specific permission to choose one of these options—you cannot take it without my permission.

ALTERNATIVE GRADING OPTION 1. You are required either to find a test you will want to evaluate or to select a test from the tests I will provide to you for evaluation. Next, you will have to collect the data using the test and to enter them (i.e., you will have to administer the test to your friends, parents, relatives, etc.; 4% of your course grade) and to analyze the data using SPSS software (5% of your course grade) (10% course grade in total). Under this option, the value of each bi-weekly test is reduced to 7% of the course grade.

ALTERNATIVE GRADING OPTION 2. You are required to design a test (8% of your course grade), to collect the data using the test (5% of your course grade) and to analyze the data using SPSS software (5% of your course grade). Under this option, the value of each bi-weekly test is reduced to 4%.

THE FINAL GRADING SCALE

The final grade scale is non-competitive scale; it is WYSIWYG or What-You-See-Is-What-You-Get scale. The feature advantage of the WYSIWYG scale is that it promotes interaction between you and your colleagues; you can form study groups and generally help each other to understand the material without lowering your relative standing (and receiving a worse grade on a curve grading system).

GRADUATE STUDENT EVALUATION

Graduate students are required to take ALTERNATIVE GRADING OPTION 2 (or come to an alternative arrangements with me) but they have to take the tests and the tests will have a normal weight. Moreover, the standard for grading their papers will be higher. Their final grade will be determined out of 120.

Grade scale	
A	93-100
A-	90-92
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	63-66
D-	60-62
F	0-59

ASSIGNMENT CREDITS

You will have an opportunity to earn extra credits by completing special assignments that will be announced from time to time. For example, I may ask you to summarize and critically evaluate a research report in a brief written report. If you receive credits for the assignment, you must be ready and willing to make a brief 5-10 minutes presentation on your assignment to the class. Not everyone will be asked to make a presentation but if you are asked and you choose not to make the presentation, you will receive no credits for the assignment. The assignment credits will be multiplied by 1 and added to your final percentage grade.



MEDIA CREDITS

You can submit up to 2 newspaper, popular magazine stories, or videos that grabbed your attention and that are directly relevant to the material covered by the course (scientific journal are not acceptable, internet articles are not acceptable with the exception of internet materials printed out from the newspaper sites). The submission should grab the attention of your colleagues, if presented. You need to submit a hard copy. Each submission is graded on a PASS/FAIL basis and is worth of 1 credit. The deadline for the first submission is the end of 4th week and deadline for the second submission is the end of 8th week. If a submission is judged as unacceptable/FAIL, you can resubmit as long as your submission PASSES by the deadline. If I ask you to present your submission to class and you agree, you will earn additional 1 credit towards your 5% extra credit maximum. Media credits are multiplied by 1 and added to your final grade.



REQUIRED TEXTS

Kaplan, R. M., & Saccuzzo, D. P. (2001). *Psychological Testing: Principles, Applications, and Issues*. (Fifth edition). Belmont, CA: Wadsworth.



American Psychological Association (2001). *Publication Manual of the American Psychological Association*. 5th Edition. Washington, DC.: American Psychological Association.

OPTIONAL/RECOMMENDED TEXTS

These texts may or many not be useful to you depending on your facility with computers and on your proficiency in material acquired in prerequisites.

Norusis, M. J. (2002). *SPSS 11.0 Guide to Data Analysis*. Upper Saddle River, NJ: Prentice-Hall.

FREE SUPPLEMENTARY & HIGHLY RECOMMENDED TEXTS

The following texts are web-based text available for free to refresh your memory of prerequisites, to look up basic statistical terms, if you need to.

StatSoft, Inc. (1999). *Electronic Statistics Textbook*. Tulsa, OK: StatSoft. WEB: www.statsoft.com/textbook/stathome.html.

Stockburger, D. W. (1996). *Introductory statistics: Concepts, models, and applications*. WEB: www.psychstat.smsu.edu/sbk00.htm.

RELATION BETWEEN LECTURES & TEXT

The lectures will be in step with the assigned list of readings. The lectures are intended to augment the text.

Requests, Comments, Feedback, & Wishes

You may and you are encouraged to post any requests, comments, or any ideas related to this course for benefits of your classmates. You can also submit you requests, comments, feedback & wishes by talking to me, by emailing such wishes to the course mail list, or anonymously via my website (anonymous submissions from any computer worldwide).

Resources

Www.orst.edu/~uttlb Course website will have online syllabus, announcements, assignments, lecture overheads, study guides, practice questions, links to free supplementary texts, and other interesting links. It is also a place to visit to check your grades and progress.

Reserve Desk OSU Valley Library Required text will be placed on Reserve in OSU Library.

Psychology department computer lab The computer lab has 20 Pentium-III class and 10 Celeron class computers. Pentium-III class computers have SPSS installed on them. All computers are networked and have access to internet. Depending on the availability of funds to pay for student attendants or availability of student volunteers, the lab may be open outside of the class hours for drop-in.

OSU Computer Labs OSU has numerous computer labs open either 24 hours or into the late night hours. Some of them have SPSS installed. Specifically, you can go and work in MILNE computer lab and use SPSS there.

Example papers Several example papers evaluating tests will be placed on my website. An examples of a student paper that received A in this class during 2000/2001 academic year will also be posted on the website.

Example conference style presentation Several example presentation will be placed on my website as well as an example of a student presentation.

FAQ Frequently Asked Questions and answers are posted on my website.

SPSS FAQ Frequently Asked Questions about SPSS are posted on my website.

FINAL PAPER FAQ Frequently Asked Questions about FINAL PAPER are posted on my website.,

COURSE POLICIES

READ THESE POLICIES VERY CAREFULLY!

MISSED TESTS/ASSIGNMENTS & LATE ASSIGNMENTS

The **TESTS WILL BE GIVEN ON PUBLISHED DATES ONLY**. There will be no make-up examinations or tests. **MISSED EXAMS RECEIVE GRADE ZERO UNLESS YOU ESTABLISH** valid medical and other serious excuses (please note that parties, snowboarding trips, family and friends visit are not serious excuses). Documentation (i.e., a valid, current note from a medical practitioner) is required to establish a valid excuse within 10 days of the illness end.

If you are going to miss a test or exam for a valid medical reason, you must inform me *in advance of the test or examination*. No after-the-fact excuses will be accepted. Please email me at bob.utt1@orst.edu or call my office (737-1374).

A missed test or exam without a valid excuse (see above for a definition) will receive a grade of zero.

Late assignments receive zero. An assignment is considered late if it is turned in later than 15 minutes from the start of the class.

Late drafts & papers incur 1% **FINAL GRADE PENALTY** for each 24 hour period.

CLASSROOM PARTICIPATION

Your comments and questions are welcome in class. Classroom discussions are an important part of this course, and you are expected to share your questions, comments and ideas. Your regular attendance in class is required and expected.

YOU ARE RESPONSIBLE FOR ALL MATERIALS, INCLUDING ALL ANNOUNCEMENTS AND CHANGES IN THE COURSE SCHEDULE, ETC., THAT ARE MADE IN CLASS, ANNOUNCED ON THE COURSE MAILSERVER AND/OR THE COURSE WEBSITE

You are required to subscribe to a class mail-server. You are responsible for each and all announcements made on the server. If you have a difficulties signing up, CONTACT ME IMMEDIATELY.

STUDENTS WITH DISABILITIES

Students with documented disabilities who may need accommodations, who have any emergency medical information the instructor should know of, or who need special arrangements in the event of evacuation, should make an appointment with the instructor as early as possible, no later than the first week of the term.

ACADEMIC DISHONESTY

Academic dishonesty does not help you to learn the material, it is not fair to other students, and it will not be tolerated. You are responsible for reading and being knowledgeable about the University's policies on cheating and plagiarism (consult <http://www.orst.edu/admin/stucon> and <http://www.orst.edu/admin/stucon/regs.htm>).

In general, any work you present for credit or grading in this course must be your own work UNLESS I gave you a specific permission to collaborate on a specific work or assignment in writing or as part of my syllabus.

In particular, note that:

Academic dishonesty includes but is not limited to

"CHEATING" (the intentional use or attempted use of unauthorized materials, information, or study aids);

"FABRICATION" (the intentional falsification or invention of any information including data, medical notes, excuses, etc.);

"ASSISTING IN DISHONESTY OR TAMPERING" (intentionally or knowingly helping or attempting to help another commit an act of dishonesty or tampering with evaluation instruments and documents); and

"PLAGIARISM" (intentionally or knowingly representing the words or ideas of another person as one's own).

In a case of academic dishonesty, at least 30% will be deducted from your final percentage grade, but you may also receive F for the course. Report of Academic Dishonesty will be filed both with the department and Student Conduct Office as required by the university policies. An act of academic dishonesty may also result in an expulsion from the University.

Lectures, Reading & Deadlines

WEEK	READINGS	TOPICS
#1 Sep 30	C&S 2	Outline, Grading Policies, Academic dishonesty, Introduction Exploratory Data Analysis, Norms & Basic Statistics LAB 1: Descriptive stats, EDA, & Norms via SPSS
#2 Oct 7	C&S 3 C&S 4	OCT 7 ALTERNATIVE EVALUATION SELECTION DUE IN CLASS Correlations and Regression Reliability **OCT 11 SECTION TEST #1** LAB 2: Correlation, regression, and reliability via SPSS
#3 Oct 14	C&S 5 C&S 6	OCT 14 TEST SELECTION [OR TEST OBJECTIVE] DUE IN CLASS Validity Building a Test/Writing and Evaluating Items LAB 3: Validity via SPSS & Test design
#4 Oct 21	C&S 8 C&S 19	OCT 21 COPIES OF 6 MOST RELEVANT J. ARTICLES OR THEIR TITLE PAGES DUE IN CLASS Test Administration Test Bias **OCT 25 SECTION TEST #2** LAB 4: Writing APA Title Page, Paper Structure, Outline & References
#5 Oct 28	APA 1.06,1.08,1.13 TBA	OCT 28 TITLE PAGE, STRUCTURE, & REFERENCES [& TEST DESIGN] DUE (1st DRAFT) Writing APA Introduction Section Evaluating a Test LAB 5: Item Analysis via SPSS
#6 Nov 4	APA 1.09 TBA	NOV 4 INTRODUCTION DUE (1st DRAFT) Writing APA Method Section Special Topics: Using Tests to Make Decisions About Individuals **NOV 8 SECTION TEST #3** LAB 6: Figures and tables
#7 Nov 11	APA 1.10, 3; TBA C&S 7	NOV 11 METHOD [& COLLECTED DATA] DUE (1st DRAFT) Writing APA Results Section; Intro to Factor Analysis Selection and Decision Analysis & Using Tests for Screening LAB 7: Special topics/Open lab
#8 Nov 18	APA 1.11, 1.07, Hill TBA	NOV 18 RESULTS DUE (1st DRAFT) Writing APA Discussion Section & Conference Style Presentation To be judged by an equation or by a committee? That is the question! **NOV 22 SECTION TEST #4** LAB 8: Special topics/Open lab
#9 Nov 25		NOV 25 DISCUSSION DUE (1st DRAFT) Student conference style presentations NOV 29 HOLIDAYS
#10 Dec 2		DEC 4 FINAL APA RESEARCH PAPER DUE IN CLASS Student conference style presentations

***** THIS COURSE HAS NO FINAL *****

C&S = Caplan & Saccuzzo; APA = Publication Manual of the American Psychological association; Hill = Mark Hill

DISCLAIMER

The syllabus is tentative and subject to change according to the needs and interests of the class.

APA PAPER

OBJECTIVE: Evaluate a psychological test from psychometric perspective based on a specific data set.

OVERVIEW

A research report written in APA style consists of 4 main sections: introduction, method, results and discussion. The introduction develops the problem under investigation and gives the statement of the investigation's purpose. The method section describes the method used to conduct the investigation. The results report the findings. The discussion interprets the findings, discusses their implications and limitations.

Examples:

Study one-experiment paper example in APA manual.

Study specific examples provided on my web site.

STRUCTURE

Title Page [APA 1.06]

Title

Author & affiliation

Running head

Short-title

Abstract [APA 1.07]

Problem

Participants

Method

Findings

Conclusions

Guidelines/Requirements:

- Accurate
- Self-contained
- Concise & specific
- Non-evaluative
- Coherent and readable
- Max 120 words

Introduction [APA 1.08]

Introduce the problem

Develop the background (concise summary of what was done and what is missing)

Set the purpose and rationale (Outline of how you approached the problem)

Guidelines/Requirements:

- If you have not read an article, you cannot cite it (reading an abstract does not count...)

- You must cite relevant original research literature (minimum 6 articles for this paper)
- In general, books, reviews, etc. are not original research literature (although exceptions exist)

Method [APA 1.09]

Subjects [& Design]

Measurement Instruments

Procedure

Guidelines/Requirements:

- An acid test of adequate method section: Can I replicate your study based on your method section?
- Subject section should include major demographic characteristics of subjects, a method of recruitment, reasons for exclusions, etc.
- Description of a measurement instrument should include: what it measures, description of items and response scale including examples, number of items, scoring, reliability (if known), validity (if known)
- Procedure section needs to describe each step in the execution of research, including randomization, counterbalancing, instructions to participants, etc.

Results [APA 1.10]

Preliminaries (distribution checks, outlier identification and treatment, compositions of combined scales)

Descriptive results/Norms (M & SDs, min-max range) followed by inferential results (t-tests, F-tests, etc.)

Reliability

Validity

Item analysis (item difficulty, item-to-total correlations, discrimination index,...)

++Subscale identification (e.g., factor analysis)

++Test bias assessment

Guidelines/Requirements:

- Results must report sufficient detail to justify the conclusions
- Use a mixture of text, tables, and figures (A good picture is worth of a thousand words.)
- When reporting descriptive statistics, include means, standard deviations, per cell sample size, and ranges.
- When reporting inferential statistics (e.g., t-tests, F-tests), include information about the magnitude of statistics, the degrees of freedom, the probability of obtaining a value as extreme or more extreme than the one obtained, the direction of effect, and a magnitude of effect size (d, eta-squared, etc.). If you have done an analysis of variance give the estimates with their degrees of freedom, F values, MSe, and an index of effect size.
- Give an estimate of the power of the study if you failed to reject NULL
- Item analyses ought to include item means, SDs, item-to-total correlations, Cronbach's alpha if item deleted, and discrimination index. As an option, they may also include ICCs.
- Do not give results to a greater degree of accuracy than that of the measurement
- Avoid using percentages unless the groups have close to or more than 100 subjects

Discussion [APA 1.11]

Brief statement of the main findings

Comparison of the results with the published findings

Implications

Limitations

Guidelines/Requirements:

- Summary ought to be brief, concise, and comprehensive
- Comparison needs to discuss similarities and differences with previous work
- Implications of the study
- Limitation ought to discuss issues limiting the study's findings, implication, generalizability, etc.

References [APA 1.13; see APA chapter 4 for specific examples]

References cited in the text & tables

Author note [APA 1.15 & 3.889]

Departmental affiliation

Sources of financial support [if any]

Acknowledgements

Contact information

Footnotes [optional; APA 3.87]

Tables [3.62-3.74; note 3.74 checklist]

Tables with table captions.

Figures [3.75-3.86; note 3.86 checklist]

Figures with figure captions on a preceding page.

MANUSCRIPT EVALUATION

Quality of content [APA pp. 4-6; note 1.01 and 1.02 checklists]

Quality of presentation [APA pp. 29-30; note the checklist]

Checklist for manuscript submission [APA Appendix A]

GRADING

Grading will be based on this document and APA style. Minor deviations may be allowed but in case of disagreement the APA style manual takes precedence:

- | | |
|--|-----|
| • Necessary content/parts (all APA sections, all necessary content, etc.)? | 50% |
| • Quality of content (comprehensive intro, accuracy, etc.)? | 30% |
| • Quality of presentation (grammar, spelling, readability, etc.)? | 10% |
| • APA style followed? | 10% |
| • Overall impression (i.e., clean, professional, stapled, etc.)? | 5% |

Sections preceded with ++ markers will be graded for extra paper points—they are no required.

HAND IN

- Two copies of your final paper
- Your own grading of your own paper
- SPSS Syntax
- Submit electronic versions of your paper, data, and SPSS syntax