

SCIENTIFIC THINKING IN PSYCHOLOGY (PSY 301)

University of Oregon

Fall 2016

T/Th 10:00-11:20 am ♦ Straub 245 ♦ 4 credits ♦ CRN: 17153

<http://canvas.uoregon.edu>

Instructor

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COURSE MATERIALS

- ♦ **Textbook:** Morling, B. (2015). *Research Methods in Psychology: Evaluating a World of Information* (2nd ed.). New York: Norton. The textbook has a website with supplemental materials that may be helpful for your studying: <http://www.norton.com/college/psych/research-methods-in-psychology/>
- ♦ **PDF files on Canvas:** Additional readings and materials will be posted on our Canvas site. See reading list at the end of the syllabus for full references.
- ♦ **iClicker:** If you do not own one already, you will need to purchase an iClicker for use in class. It will be used to track attendance and to do regular learning assessments.

COURSE DESCRIPTION

"Follow the data" is a core principle in all sciences. In this course, you will learn how to "follow the data" to make sense of human behavior and think like a psychologist. You will acquire the fundamentals of how to evaluate new knowledge about human behavior by carefully considering the properties of data collected from human beings. We will consider all aspects of an empirical endeavor, from formulating a testable scientific hypothesis, to collecting relevant and valid data, to analyzing and communicating these data, to asking what's next. Making sense of how and why people feel, think and act the way they do is something we all do everyday -- in this course, we will learn how to give ourselves the best shot at making conclusions that are true. Whether we read about others' discoveries or make our own, we should follow the data.

PSY 301 meets the criteria of a Group-Satisfying Science (SC) course by introducing you to the fundamental methods that are used in psychological science and demonstrating the way knowledge is created in the field. The course emphasizes the critical thinking skills that are essential for informative scientific endeavors. The course addresses upper division science group criteria by encouraging the specific application of general scientific principles and skills; for example, by requiring you to evaluate claims about human behavior that appear in scientific articles as well as in the media. The evaluation methods used in this course will measure a high level of understanding by expecting you to continually practice and apply sophisticated empirical thinking skills.

This course is the first course in the PSY 301-303 sequence for psychology majors. Majors will be building critical thinking skills and an understanding of how knowledge is generated in psychological research in preparation for acquiring data analysis skills in PSY 302. In PSY 303 you will be using the skills you gained in PSY 301 and PSY 302 to design, implement, analyze, draw conclusions from, write up, and present scientific research in psychology.

LEARNING OUTCOMES

You will develop many skills in this course. By the end of this course you should be able to:

- ◆ Think. Think like a scientist when you read science headlines – you will become a sharper consumer of scientific discoveries. Follow the data by searching for evidence, rather than just accepting claims you encounter.
- ◆ Find. Find key ideas and evidence in scientific literature and media reports. Identify research questions, hypotheses, research design, and evidence in scientific articles and news articles.
- ◆ Show. Show how evidence does or does not support an interesting hypothesis about human behavior. Critically evaluate research designs and the quality of evidence presented in scientific articles.
- ◆ Tell. Communicate clearly and effectively about psychological research, including methodological and ethical issues in psychology, based on an understanding of both the strengths and limitations of empirical evidence.

COURSE EXPECTATIONS

Class attendance is essential to your success in this course. Attendance will be tracked using iClickers. Class sessions will focus on developing your skills as consumers of psychological research, but they will also provide you with tools necessary for being producers of research. This course promotes active learning through discussion, in-class exercises and activity assignments. When in class, you should stay engaged with the material rather than just going through the motions. Do the in-class exercises. Ask questions. Take notes. Go to office hours.

Come **prepared** to class. Read the assigned readings prior to class, think about what you read, and bring questions if you have them. You will not do well on quizzes and assignments if you do not keep up with the reading.

STUDENT WORKLOAD

When you complete this course, you will earn 4 credits toward your degree. Four credits is the equivalent of 120 hours of work across the term, or 12 hours per week for 10 weeks. You will spend 3 hours in class each week. The other 9 hours will be spent completing readings (about 4 hours per week; 40 hours total) and activity assignments, two of which will be critical review papers (about 40 hours total), and studying for quizzes and the final exam (at least 10 hours total, although more time may be needed for best results). The workload will be relatively steady throughout the term, as we build skills through regular assignments and consolidate knowledge through regular quizzes.

COURSE REQUIREMENTS

Reading Assignments

You should complete the assigned reading **before** coming to class. The textbook is accessible and engaging. Although the reading load will be relatively demanding, it should be fun and rewarding to do. Material from the readings will be on quizzes and the final exam, and you will also apply principles from the readings to your activity assignments.

Attendance/Participation

You must participate in *ungraded* class exercises using your iClicker to get credit for each day you attend lecture. While you get 2 “free” miss days, you shouldn’t use them unless absolutely necessary; if you skip class, you will miss important information. **Important note on iClickers: You are required to have an iClicker and register it on Canvas by the start of Week 2, or you will begin to lose attendance points.**

Activity Assignments and Critical Review Papers

This is where the magic happens. You will be expected to build your skills consistently throughout the quarter. Almost half of the grade you earn in this course will come from activity assignments and critical review papers, as befits the importance of learning to actively grapple with the empirical process – critically evaluating empirical claims and connecting these claims to data. *See the assignment schedule for more details.* You will receive specific written instructions for each assignment. Your best bet is to attend lectures every week and build skills with your instructor and fellow student colleagues.

Assignments must be submitted on Canvas by the beginning of class on Thursday. Late assignments will be penalized by 50% regardless of when they are submitted, and no assignments will be accepted more than 1 week late without some documented medical or family emergency.

Quizzes

There will be 4 in-class quizzes throughout the term (on Tuesday in weeks 3, 5, 7, & 10). Quizzes will consist of conceptual and applied multiple-choice questions and one or two short-answer questions, similar to the exercises we work on in class. Quizzes will cover all material from class and the readings since the previous quiz.

Quizzes will begin promptly at the start of class, and you will have 40 minutes to complete them. If you finish early, you may (temporarily) leave class, or sit quietly after turning in your quiz. **Lecture will start following the quizzes, and attendance will be taken at some point during lecture.**

Your lowest quiz grade will be dropped. I use this policy so that poor performance on one quiz or an absence does not negatively impact your class grade. Because of this, **there are no make-up quizzes.** If, for whatever reason (aside from university sponsored excuses), you miss a quiz, this will be the one that is dropped. *Missing subsequent quizzes will result in grades of zero for the quizzes unless there is a documented medical or family emergency.*

Final Exam

The final exam will be cumulative, covering the full quarter of material that was presented in class and the readings. **The final exam is scheduled for Thursday, December 8th at 8:00am.** The final exam must be taken at the University-scheduled time.

GRADING

Final grades in this course will be determined by the following:

- ◆ Attendance/participation: 5% – up to 2 classes can be missed without penalty
- ◆ Assignments: 45% (Activity assignments = 4% each; Critical review paper 1 = 10%; Paper 2 = 15%)
- ◆ In-class quizzes (best 3 of 4): 30% (10% each)
- ◆ Cumulative final exam: 20%

Grades will be distributed as follows:

A+	97-100%	B+	87-89%	C+	77-79%	D+	67-69%	F	0-59%
A	93-96%	B	83-86%	C	73-76%	D	63-66%		
A-	90-92%	B-	80-82%	C-	70-72%	D-	60-62%		

Please see the psychology department guidelines for a description of the type of achievement that each grade signifies: <http://psychology.uoregon.edu/courses/departments-grading-standards/>

Extra Credit

You can earn extra credit in this course by serving as a participant in the Psychology Human Subjects Pool. If you decide to participate in psychological research, you will earn 1% of extra credit toward your *final grade in the course* for each hour you participate, up to a maximum of 2% (credits beyond the maximum of 2 will not be counted). For example, 2 hours of credit would increase a final grade of 79% up to an 81%, giving you a B- for the course instead of a C+. To participate, follow the guidelines for the Human Subject Pool posted at <http://psychology.uoregon.edu/research/human-subjects-pool/>.

Students that prefer not to participate in the Psychology Human Subjects Pool can instead collect extra credit by writing a short paper. If this is your preference, please see your instructor to discuss the details of the requirement.

Additionally, I offer 1% extra credit towards your course grade for completing an anonymous online midterm course evaluation. More details will be provided in class. Again, the maximum amount of extra credit that can be earned in the course is 2%. **All extra credit work must be completed by Friday, December 2.**

SPECIAL ACCOMMODATIONS

Accessible Education Center (AEC)

If you have a documented disability and anticipate needing accommodations in this course, please notify me as soon as possible. Also, please request that a counselor at the Accessible Education Center (uoaec@uoregon.edu, 541-346-1155) send a letter verifying the type of accommodation that is appropriate. For a list of resources provided by the Accessible Education Center, please see <http://aec.uoregon.edu>.

Students for Whom English is a Second Language

If you are a non-native English speaker and think you may have trouble in this course due to language difficulties, please see me as soon as possible to make any necessary special arrangements.

ACADEMIC INTEGRITY

We take academic integrity seriously. **All work submitted in this course must be your own.** Cheating includes providing or accepting information on an exam or assignment, or allowing someone else to copy your work. In addition, lying to try to get points (e.g., lying about having turned in an assignment on time) is considered academic dishonesty and will be treated as cheating. Plagiarism means copying someone's written work without proper citation (this includes your classmate's work, scholarly articles, Wikipedia, or other websites).

All instances of cheating and plagiarism will have serious consequences. You will receive a zero on the assignment and be reported to UO's student conduct coordinator. If the offense is serious, you will receive an F in the course.

Simply put: Don't cheat and don't plagiarize. You will be mad at me, and (hopefully) disappointed in yourself. It's not worth it. If you have any questions about what constitutes academic dishonesty, please ask me.

For more information, see the UO website regarding academic honesty at:

<http://uodos.uoregon.edu/StudentConductandCommunityStandards/AcademicMisconduct.aspx>

CLASSROOM ETIQUETTE

As a courtesy to your instructor and to your fellow classmates, please arrive on time for class and stay for the duration of the class period. Getting up in the middle of class is very disruptive. Please turn off cell phones and any electronic devices that might be distracting to others at the beginning of class. Treat your fellow students and your instructor with respect.

COURSE SCHEDULE

**The course schedule may change, but quiz/exam dates will not change unless absolutely necessary.*

Week	Date	Topic	Reading	Quizzes/Assignments
1	T 9/27	Course overview: Thinking like a scientist	Ch. 1	
	Th 9/29	Why do research, and where to find it	Ch. 2 Roediger & Gallo	Register i-clicker
2	T 10/4	Variables and claims	Ch. 3	
	Th 10/6	Validities	Iacoboni et al. Response	AA 1
3	T 10/11	Measurement reliability	Ch. 5	Quiz 1
	Th 10/13	Measurement validity		AA 2
4	T 10/18	Research ethics	Ch. 4 Milgram	
	Th 10/20	Surveys and observations	Ch. 6	
5	T 10/25	Sampling	Ch. 7	Quiz 2
	Th 10/27	Bivariate correlation	Ch. 8	Paper 1
6	T 11/1	Multivariate correlation	Ch. 9	
	Th 11/3	Class discussion	Platt Feynman	AA 3
7	T 11/8	Intro to experimental designs	Ch. 10	Quiz 3
	Th 11/10	Confounds and obscuring variables	Ch. 11	AA 4
8	T 11/15	Complex experimental designs	Ch. 12	
	Th 11/17	Factorial variations		AA 5
9	T 11/22	Quasi-experimental designs	Ch. 13	
	Th 11/24	Thanksgiving – No Class		
10	T 11/29	Replicability and generalization	Ch. 14	Quiz 4
	Th 12/1	Review		Paper 2
11	Th 12/8	8:00am Cumulative Final Exam		

ASSIGNMENT SCHEDULE

**All assignments are due at the beginning of class on Thursday.*

Week	Goals	Activity	Due
1			
2	Empirical thinking: Recognize empirical claims in the news & in scientific papers	<ul style="list-style-type: none"> Identify claims and variables in news articles and scientific articles; ask questions about validities Identify the key sections of an empirical paper that tests hypotheses about human behavior 	Activity Assignment #1
3	Empirical thinking: Link claims to data	<ul style="list-style-type: none"> Evaluate how variables are operationalized and measured Draw data plots showing expected empirical outcomes 	Activity Assignment #2
4			
5	Critical review paper #1: Evaluate media coverage of science	<ul style="list-style-type: none"> Read an empirical article, identify the research question, evaluate the research methods, and critically review the coverage of the research in the media 	Critical Review Paper #1
6	Empirical thinking: Interrogate association claims	<ul style="list-style-type: none"> Interrogate the validities of studies testing association hypotheses Distinguish association claims from causal claims Compare & contrast study designs to test hypotheses about associations among measured variables 	Activity Assignment #3
7	Empirical thinking: Interrogate causal claims	<ul style="list-style-type: none"> Interrogate the validities of studies testing causal relationships among manipulated & measured variables Identify potential threats to internal validity in experimental designs 	Activity Assignment #4
8	Empirical thinking: Explore complex relationships	<ul style="list-style-type: none"> Describe interaction effects in everyday terms Identify and interpret main effects and interactions from a factorial design 	Activity Assignment #5
9			
10	Critical review paper #2: Evaluate media coverage of science	<ul style="list-style-type: none"> Read an empirical article, identify the research question, evaluate the research methods, and critically review the coverage of the research in the media 	Critical Review Paper #2

READING LIST

***These are required readings.** Each reading is posted on Canvas and is assigned to a particular class session.

Iacoboni, M., Freedman, J., & Kaplan, J. (2007, November 11). Op-Ed; This is your brain on politics. *The New York Times*, p. 414.

<http://www.nytimes.com/2007/11/11/opinion/11freedman.html?ex=1352437200&en=e0ca987ad4bd515f&ei=5090&partner=rssuserland&emc=rss>

Response: Politics and the Brain. (2007, November 14). *The New York Times*.

<http://www.nytimes.com/2007/11/14/opinion/lweb14brain.html>

Milgram, S. (1965/1972). Some conditions of obedience and disobedience to authority. In Arthur G. Miller (Ed.), *The Social Psychology of Psychological Research* (pp. 82-105). New York: Free Press.

Platt, J. R. (1964). Strong inference. *Science*, 146(3642), 347-353.

Feynman, R. P. (1974, June). *Cargo cult science*. Commencement address presented at Caltech, Pasadena, CA.

Roediger, H. L., & Gallo, D. A. (2004). How to read a journal article in cognitive psychology. In D. A. Balota & E. J. Marsh (Eds.), *Key readings in cognition: Cognitive psychology* (pp. 721-731). New York: Psychology Press.