

PSYCHOLOGY 6334: FOUNDATIONS OF RESEARCH

FALL 2018 (CRN 15290)

Meetings: Mondays & Wednesdays, 9:00-10:20 a.m. Classroom Building, Room C203

Instructor: Dr. James Wood
Psychology 203
Phone: 747-6570 E-mail: jawood@utep.edu
Office Hours: Mondays & Wednesdays 10:30 a.m-12:00 p.m. or by appointment

Texts: Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Boston: Houghton Mifflin.

Steven Johnson (2007). *The Ghost Map*
(This book is not in the UTEP bookstore. Students can order it in paperback online.
Used copies are fine.)

COURSE SCHEDULE

Readings and assignments must be completed by dates listed below.

MONDAY, AUGUST 27. Course Introduction

WEDNESDAY, AUGUST 29 Historical Development of the Scientific Method Part 1:
Scientific Contributions of Pre-Greek and Non-Western Cultures

MONDAY, SEPTEMBER 3 Labor Day. University is closed.

WEDNESDAY, SEPTEMBER 5: Historical Development of the Scientific Method Part 2:
Thales and the Beginnings of Natural Philosophy

Reading: Shadish et al., Chapter 1 "Experiments and Generalized Causal Inference"

MONDAY, SEPTEMBER 10 Historical Development of the Scientific Method Part 3:
Natural Philosophy in the Greek Classical and Hellenistic Periods

Reading: Shadish et al., Chapter 2: "Statistical Conclusion Validity and Internal Validity"

WEDNESDAY, SEPTEMBER 12 Historical Development of the Scientific Method Part 4:
Heirs of the Greeks: India, Islamic Culture, and the Middle Ages

MONDAY, SEPTEMBER 17: Historical Development of the Scientific Method Part 5:
New Methodologies of the Scientific Revolution.

Reading: Shadish et al., Chapter 3: "Construct Validity and External Validity"

WEDNESDAY, SEPTEMBER 19 Historical Development of the Scientific Method Part 6:
The Early Modern and Modern Periods

MONDAY, SEPTEMBER 24: The Meaning of Cause. Part 1

Reading: Shadish et al., Chapter 4: "Quasi-Experimental Designs That Lack a Control Group or Lack Pretest Observations on the Outcome."

WEDNESDAY, SEPTEMBER 26: The Meaning of Cause. Part 2

MONDAY, OCTOBER 1: The Four Kinds of Validity. Part 1

Reading: Shadish et al., Chapter 5: "Quasi-experimental Designs That Use Both Control Groups and Pretests" [No quiz today because midterm is on Wednesday]

ALSO ON OCTOBER 1: Instructor distributes instructions for first research design assignment.

WEDNESDAY, OCTOBER 3: MIDTERM EXAM 1

MONDAY, OCTOBER 8 No Class Meeting

WEDNESDAY, OCTOBER 10: The Four Kinds of Validity. Part 2

Reading: Shadish et al., Chapter 8: "Randomized Experiments: Rationale, Designs, and Conditions Conducive to Doing Them"

SUNDAY, OCTOBER 14: A COPY OF YOUR FIRST RESEARCH DESIGN ASSIGNMENT MUST BE EMAILED AS AN ATTACHMENT TO THE INSTRUCTOR BY 11:00 P.M.

MONDAY, OCTOBER 15: The Four Kinds of Validity. Part 3

Reading: Shadish et al., Chapter 9: "Practical Problems 1: Ethics, Participant Recruitment, and Random Assignment"

ALSO ON OCTOBER 15: Instructor distributes instructions for second research design assignment.

WEDNESDAY, OCTOBER 17. The Four Kinds of Validity. Part 4.

Reading (no quiz): Henrich, J., Heine, S. J & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, 33, 61-83.

MONDAY, OCTOBER 22: Practical issues in study design. Part 1.

Reading: Shadish et al., Chapter 10: "Practical Problems 2: Treatment Implementation and Attrition"

WEDNESDAY, OCTOBER 24: Practical issues in study design. Part 2.

MONDAY, OCTOBER 29: Class Discussion of *The Ghost Map*

Reading: *The Ghost Map*

WEDNESDAY, OCTOBER 31 Class Discussion of *The Ghost Map*

SUNDAY NIGHT, NOVEMBER 4:

A COPY OF YOUR SECOND RESEARCH DESIGN ASSIGNMENT (10-15 PAGES) MUST BE E-MAILED TO THE INSTRUCTOR BY 11:00 P.M.

MONDAY, NOVEMBER 5: The Scandal of Induction & Falsificationism.
The Context of Discovery & the Context of Confirmation

WEDNESDAY, NOVEMBER 7 Research Integrity & Open Science

Readings (no quiz today)

Thomas, K. (June 29, 2013). Breaking the seal on drug research. *New York Times*.

Ioannidis, J. P. A. (2005). Why most published research findings are false. *PLoS Medicine*, 4(8), 0696-0701.

Kerr, N. L. (1998). HARKing: Hypothesizing After the Results are Known. *Personality and Social Psychology Review*, 2, 196-217.

MONDAY, NOVEMBER 12: SECOND MIDTERM

(Examination will cover all readings and lectures not covered in the first midterm)

WEDNESDAY, NOVEMBER 14 Student Reflections on Ideas Introduced in the Course

FRIDAY, NOVEMBER 16

By 11:00 P.M., WRITTEN COPIES OF YOUR REVIEWS OF RESEARCH PROPOSALS MUST BE E-MAILED TO THE INSTRUCTOR AND THE TWO STUDENTS WHOSE PROPOSALS YOU REVIEWED

NOVEMBER 19, 26, 28, AND DECEMBER 3: Student Presentations

(No class meeting Nov 21)

WEDNESDAY, DECEMBER 5: Students Evaluate Course.

SUNDAY NIGHT, DECEMBER 9:

A FINAL REVISED COPY OF YOUR PROPOSED STUDY MUST BE E-MAILED TO INSTRUCTOR BY 11:00 P.M.

COURSE OBJECTIVES

1. Students will be able to describe the most important elements of the scientific method and their historical and philosophical roots.
2. Students will be able to describe the philosophical foundations of causal inference and explain how these foundations are related to experimental and quasi-experimental methodology.
3. Students will be able to explain the four types of validity involved in causal inference, describe the threats to each of these types of validity, and identify these threats in actual studies.
4. Students will be able to describe the research designs most commonly used to explore causal relationships and their strengths and weaknesses. Students will be able to identify the most important elements of experimental design and explain how each element strengthens causal inference.
5. Students will be able to describe the problems commonly encountered by researchers using experiments and quasi-experiments, in both laboratory and field settings, and how these problems can be dealt with.
6. Students will be able to describe the ethical considerations that are relevant to experiments and quasi-experiments and be able to explain how researchers and institutions can ensure that research is carried out in an ethical manner.
7. Students will be able to design studies that are methodologically sound, practical, and ethical.

8. Students will be able to offer intelligent, helpful critique of studies designed by other researchers and be able to identify ways that these studies can be made more methodologically sound, practical, and ethical.
9. Students will understand the "replication crisis" in psychology and medicine and the advent of Open Science.
10. Students will increase their proficiency in making written and oral presentation of research proposals.

INSTRUCTIONAL APPROACH

Class objectives will be achieved using the following instructional methods:

1. The instructor will lecture during most class meetings before Thanksgiving. In-class instructional exercises will occasionally be used.
2. Students will read eight chapters in the text by Shadish, Cook & Campbell before Thanksgiving. The pace of reading will be approximately one chapter per week.
3. Students will also read "The Ghost Map" as an example of the difficulty and the importance of discovering and studying causal connections in uncontrolled environments.
4. There will be eight quizzes on the readings.
5. There will be two non-cumulative midterm examinations on the readings and the lectures.
6. Students will write one short research proposal on a topic assigned by the instructor.
7. Students will write a longer research proposal on a topic of their own choosing, within guidelines set by the instructor.
8. Students will write reviews of each other's research proposals
9. Students will give PowerPoint presentations to the class on their research proposals.

GRADING AND COURSE REQUIREMENTS

Quizzes

There will be eight quizzes during the semester, one quiz for each chapter assigned in the book by Shadish et al (except when otherwise noted in the syllabus), and one quiz on *The Ghost Map*. Each quiz will be given on the day that a reading is assigned in the class syllabus and will cover only that reading.

Students' six best grades on the quizzes will be averaged to compute their "quiz grade". This grade will count toward 40% of students' course grade. Students who arrive more than 5 minutes after the beginning of the class will not be allowed to take the quiz. There are no make-ups for quizzes.

The purpose of quizzes is to ensure that students do the readings. Study questions for each chapter of the Shadish et al. book are listed on Blackboard for this course. All quiz and exam questions regarding Shadish et al. will be taken directly from these study questions.

On the days that readings are due and a quiz is scheduled, the instructor will spend about 10 minutes at the beginning of class answering students' questions about the readings. If students have questions they want the instructor to answer, they should submit the questions to him via email before 7.a.m. the day of the quiz. The instructor will try to answer as many of these questions as possible during the first 10 minutes of class but may not have time to answer them all.

Quizzes and exams often “recycle” questions that were used when this course was offered in earlier semesters. You should not use earlier quizzes or tests from previous years to prepare for this course. Any use of quizzes or tests from prior years constitutes academic dishonesty and, more importantly, will reduce the amount that you learn from this course.

The Ghost Map

The book *The Ghost Map* is assigned because it provides an excellent and dramatic case study of the challenges and rewards of drawing causal inferences in uncontrolled environments. The UTEP bookstore does not carry this book, so you will have to order it online. Used paperback copies are available on Amazon.com for about \$7.00, plus \$4.00 shipping. *The Ghost Map* is fairly easy reading, but it is an entire book, and so it’s recommended that you order it early in the semester and start reading it chapter by chapter long before it is assigned.

Midterm Examinations

The first Midterm Examination will cover all lectures and readings up through October 1, including Chapters 1 to 5 of Shadish et al. The second Midterm Examination will cover all lectures and readings in the course not covered in the first midterm (in other words, the second midterm is non-cumulative). Each midterm will count toward 10% of your grade.

The Midterm Examinations will be very much like the quizzes, but will be longer and include questions from lectures. Questions that appeared on the quizzes may "re-appear" on the midterms.

There is no make-up exam for the Midterm Examinations without prior arrangement. If you must miss a Midterm, please make arrangements BEFORE it is given. If you miss it without making prior arrangements, you will receive a failing grade for the examination. Students who are more than 10 minutes late for the examination will be considered to have missed the exam and will receive a failing grade.

First Research Design Assignment

On October 1, the instructor will hand out an assignment that describes a specific research question and asks you to design a study to address the question. You will have approximately two weeks to do this assignment, which must be 5-10 pages long and emailed to the instructor by 11 p.m. on Sunday, October 14. The purpose of this assignment is to give you practice designing a short and fairly simple study. This assignment will count for 10% of your grade. This assignment must be submitted as a double-spaced Word document.

Second Research Design Assignment and Reviews

On October 15, the instructor will hand out a second, longer research design assignment. You will have approximately three weeks to do this assignment, which must be 10-15 pages long and emailed to the instructor by 11 p.m. on Sunday, November 4. The instructor will then post your assignment on Blackboard so that your classmates can read it. The purpose of this exercise is to give you additional practice in constructing workable experiments or quasi-experiments.

The second research design will require you to design a study on a topic of your own choosing, but with the following restrictions: It should be an experiment or a quasi-experiment. It should be something you think of and design *entirely yourself*. You should not use (a) a paper or idea that you are using or have used for another class, (b) an idea that someone else suggested to you, (c) an idea or design that you have ever discussed (even briefly) with another person. This should all be your idea, your thinking, without any feedback or input or ideas from other students or faculty. It should be unlike anything you or your research collaborators have ever done or talked about before. It must also be *practical* -- something you could reasonably and practically carry out on a budget of no more than \$80,000 for personnel costs and an

additional \$40,000 for other expenses. You might want to start thinking now about what topic you want to explore in your second research design.

You will be assigned to review two of the proposals submitted by your classmates. You will have approximately two weeks to finish these reviews, which must be 2-5 pages long and emailed to the instructor and the authors of the proposals via email by 11 p.m. on Friday, November 16. The instructor will then post your reviews on Blackboard so your classmates can read them. In each review, you should identify shortcomings in the original proposals, and suggest helpful ways of dealing with these shortcomings. The purpose of this exercise is to give you practice in writing reviews and providing helpful professional advice to your colleagues. Each review will count for 5% of your course grade (10% in all).

All research proposals and reviews will be presented by students during the last weeks of class. You will make a Power Point presentation of your study, no longer than 15 minutes, with a special emphasis on the Methods. You should modify your presentation in response to the reviews you have received from your fellow students. Following your presentation, the other students will have 10 minutes to ask questions and make suggestions. All students are expected to read all of their colleagues' research proposals *before* the Power Point presentations are made.

After you have received reviews and comments from your fellow students, you will need to revise your proposal (with the same page limits) and submit it via email by 11 p.m. on Sunday December 9. Your proposal (the first draft, Power Point presentation, and finished draft) together will count for 20% of your course grade. One factor in assigning your grade will be the degree to which you intelligently incorporated the suggestions from the reviews when you re-wrote the finished draft of your proposal.

More details about the research design assignments will be provided by the instructor during the semester.

Summary of Grading for course

40%	Average of 6 best quiz grades
10%	First Midterm Examination
10%	Second Midterm Examination
10%	First Research Design Assignment
20%	Second Research Design Assignment (including PowerPoint presentation)
10%	Reviews