

PPE 4000-302
Research in PPE:
Experimental Design for Empirical Research
Spring 2024

When and where: Tuesday 12:00 – 3:00pm
Room 237, Claudia Cohen Hall

Instructor: Paul Deutchman
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<https://upenn.zoom.us/my/pauldeutchman>
Office hours: Tuesday 3-4pm
or by appointment

Course description

This course will focus on how to design rigorous experiments for empirical research. We will cover the basics of experimental design such as translating research questions into testable hypotheses, operationalizing independent and dependent variables, randomization and counterbalancing, and how to address potential issues such as confounding variables and bias in the research process. We will read a number of interdisciplinary empirical research papers—primarily from psychology, behavioral economics, and experimental philosophy—focusing on their methods and experimental design. Additionally, you will receive hands-on experience proposing and designing your own research study. By the end of this course, you will have a comprehensive understanding of experimental design and methodology and be equipped to critically evaluate empirical research across disciplines.

Course goals

- Gain a deep understanding of the fundamentals of experimental design and behavioral research
- Learn to read, understand, and critically evaluate empirical research and primary academic sources
- Acquire hands-on experience conducting a literature review and designing your own research project

- Improve your ability to effectively and clearly communicate experimental research and scientific findings both in written proposals and oral presentations

Grade breakdown

Requirement	% of Grade
Attendance & Participation	15
Discussion Board Posts	15
Activities	10
Quizzes	10
Weekly Presentations	10
Final Project Paper & Presentation	40

Overview

In-class presentations

Each week, a student will prepare a discussion of their chosen paper (see Weekly Journal Club Presentations below). Students are also expected to give a final presentation on their research project. More details will be available on Canvas.

Attendance & Participation

Students are expected to attend every class. You should come prepared having read the assigned articles and ready to discuss it. Because of the small size of the class, it's paramount that you attend every class and come prepared to contribute—this will result in the best learning experience for you and your peers. Unexcused absences will harm your attendance & participation grade. If you miss class you are responsible for that day's content—reach out to your classmates for their notes. I will also post the lecture slides on Canvas after class.

Weekly Journal Club Presentations

Each week, a student will find an article for the class to read and critique, with an emphasis on the studies methodology, analysis, and interpretation. Students can choose any article from the social sciences (e.g., psychology, economics, sociology, political science, etc.) as long as it's an empirical research paper (e.g., they collect data with an experiment). We will cover how to find and read research articles on the first day of class. If you have trouble finding a suitable research article, please reach out to me and I can help you find one or provide one for you. Students should come prepared to lead a discussion of the paper. The paper presentation should include a short summary of the research questions, methods, and results of the paper with a larger focus on the studies methodology, analysis, and interpretation of results. Because this may be some students' first experience reading primary research, I do not expect you to perfectly understand

every part of the article's methods, data analysis, or models—that is okay and expected. By the end of the class you will be much better able to understand and critically analyze peer reviewed research papers. Students may, but are not required to, create slides for their presentation. If you do choose to present slides, remember that they should be an accessory to the discussion (e.g., you should come prepared to lead an interactive discussion with the class rather than giving a talk). Students are required to send me the article they would like the class to read 2 weeks before their presentation so I can post it to Canvas and allow everyone adequate time to read it in advance of class and post to the discussion board.

Discussion Board

Students are required to read peer-assigned articles and post a discussion of that week's research paper to the Discussion Board section on Canvas. These posts should include at least 2 discussion points or questions about the paper. For example, you could post a critique of a specific methodological approach a paper uses to test their hypothesis or a question about whether the authors made an appropriate conclusion from their findings. Posts should be no less than 100 words in length. Students are encouraged to reply to and build on the points made by their peers (this counts towards the 100 word minimum). Discussion board posts will be graded similar to participation but represent a separate grading category in addition to attendance and participation.

Quizzes

You will take four short mixed-format quizzes (T/F, multiple choice, short answer, etc) throughout the semester. Each quiz will cover material from that quarter of the course (e.g., they are not cumulative). Quizzes will be completed on Canvas and will be open-book and timed (quiz format subject to change). Deadlines for completing the quizzes can be found on Canvas and the syllabus schedule. Quizzes will be available from the end of class (Monday 3pm) until the night before the next class (e.g., Sunday 11:59pm). For example, quiz 1 is due Tuesday 2/13 will be available on Canvas from Tuesday 2/6 at 3pm until Monday 2/12 11:59pm. Quizzes should be completed independently—students found to share answers will also receive a grade of 0. **If you miss the deadline to complete a quiz you will receive a grade of 0.**

Activities

You will complete several in-class and take-home activities throughout the semester to supplement and reinforce class content. Activities may take the form of project proposals, in-class Jeopardy and polls, or short take-home writing assignments. More details will be available on Canvas and will be explained in class.

Final Paper: Research project

In this paper, you will synthesize course content covered up to that point to write a research proposal (2500-3500 words) where you will propose a research study, conduct a literature review, make hypotheses, describe the proposed methods and expected results and interpret them. You will then present your research proposal on the final day of class. More details will be available on Canvas closer to the due date.

General Course Policies

Plagiarism

Students at Penn are expected to have high standards of integrity. Any student who cheats or plagiarizes on examinations or assignments may fail the course, and a letter of explanation will be placed in their files. Students who plagiarize are subject to dismissal from the University. Note that **substantial paraphrasing**, or knowingly using the words or thoughts of another individual (from conversation, web sources, or published or unpublished material) **without citation can also be considered plagiarism**. (This means that you need to work to put things into your own words. Substantial quoting, with appropriate citation, is not plagiarism but is lazy writing, and will be marked down.) Any work that has been confirmed to be plagiarized will receive a grade of 0. For information on Penn's Integrity Policy, see: <https://catalog.upenn.edu/pennbook/code-of-academic-integrity/>. If you are unsure of the appropriate way to give credit in a paper or about any other aspect of an assignment, please contact me.

ChatGPT

There are a few situations in which using ChatGPT is acceptable. For instance, it would be acceptable to use it to help brainstorm examples of a psychological phenomenon such as social norms. It is not acceptable to use ChatGPT to actually write assignments for you (including discussion posts in addition to papers) and in any case, would be ill-advised—you'll almost always do better when writing yourself than using ChatGPT. Importantly, ChatGPT is known to make up academic citations so if you use it to write a paper, I will be able to tell and you will receive a grade of 0.

Readings

All readings for this course will be posted on Canvas in advance. There are no required textbooks for this course. Readings consist of 2-3 academic articles and/or book chapters for each class. I have kept the reading relatively light to ensure that you are really doing all the readings—please come to class prepared to discuss the assigned reading. We will draw on a few

open-source textbooks and resources throughout the class. You will read specific chapters from these sources (which will be posted to Canvas) but can find them in their entirety here:

Research Methods in Psychology: <https://kpu.pressbooks.pub/psychmethods4e/>

Social Science Research: Principles, Methods and Practices:
<https://usq.pressbooks.pub/socialscienceresearch/>

Research Transparency, Reproducibility, and Basic Data Analysis in R!:
<https://shaonl.github.io/Rbook/>

Late Submissions & Make-up Policy

All assignments are due on Canvas the night before the due date (e.g., 11:59pm). Assignments received after deadlines will automatically be marked “late” on Canvas and will receive a full letter grade deduction, with another letter grade deducted for each additional day late. Late discussion board posts will not receive credit. The only exceptions to the late policy are due to documented medical emergencies (or other Penn-approved personal emergencies). If you will have a foreseeable conflict (athletic travel, etc.), please contact me beforehand to make alternative arrangements.

Papers must be uploaded to Canvas. Please note that if your paper fails to upload properly, it will still be considered late, no matter when you sent it. It is your responsibility to ensure that we have received your papers and assignments on time.

Electronics in the Classroom

Students are not permitted to use their phones during class (during the break is okay). Students are permitted to use their laptops or tablets during class to take notes. However, out of respect to your classmates and myself, please refrain from using them for non-class related uses (e.g., online shopping, watching sports) as it is distracting to yourself and others. If I notice your use of electronics is distracting other students or you’re using them for reasons other than taking notes this will impact your participation grade in the course and I may change the policy.

Student Support

If you are a student with a documented disability seeking reasonable accommodations in this course, please contact the Weingarten Center learning. If you are feeling stressed, having challenges managing your time, sleep, or making choices around alcohol and food, Student Health and Counseling (3624 Market Street, First Floor West) offers counseling services via appointment and drop-ins.

I also encourage you to take advantage of the library resources available to you at Penn Libraries. Penn Libraries is a great resource for you and they are happy to help you with any related questions such as how to best find academic sources for a research paper.

Classroom Participation

Students are expected to attend every class and participate by asking and answering questions, participating equally in group activities, contributing to class discussion, and posting discussion questions on Canvas. Failing to do so will negatively impact your participation grade in the class. That said, students should stay home if they're not feeling well, please email me if you're unable to make it to class for that or any other reason—failing to do so will harm your participation grade. Not completing or submitting class activities or assignments (e.g., not submitting your research paper proposal) will also negatively impact your participation grade.

Canvas

A copy of this syllabus will be posted to Canvas under 'modules'. Downloadable copies of the lecture slides, details on the paper assignments, and other course materials will be posted there as well. Lecture PDFs will be available following lectures. Your reading responses and papers will be submitted to Canvas. I look forward to seeing discussions develop on the public discussion boards as well.

Email

Please allow me two business days to respond to your email. In practice I will respond to you as soon as possible. If you do not hear back from me after two days feel free to send a follow-up email. I do not regularly check my email in the evenings and the weekend so please do not expect an immediate response if you contact me during those times. Feel free to reach out to me with any questions/comments/concerns about the class, course content, or anything that's on your mind.

Grade Questions/Changes/Communication

If you have a question about a graded assignment, you must contact me no later than one week after the assignment was returned, detailing your concerns in writing and we will set up a time to meet. Discussions regarding grades will only be conducted in-person. I will entirely re-grade the assignment in question, substituting the newer grade for the original. Importantly, this means you may potentially receive a higher or lower grade than you received initially.

Schedule

Date	Topic	Readings & Assignments
Tues 1/23	Introduction and syllabus review	
	Experimental Design, Data Collection, & Measurement	
Tues 1/30	History of experiments; Experimental design I: Theory & hypothesis formation, independent & dependent measures	<ul style="list-style-type: none"> • Bhattacharjee, Ch 1-4, 2 - 33 • Bargh, J. A., Chen, M., & Burrows, L. (1996). Automaticity of social behavior: Direct effects of trait construct and stereotype activation on action. Journal of personality and social psychology, 71(2), 230.
Tues 2/6	Experimental design II: Construct validity, research design overview, randomization, and counterbalancing	<ul style="list-style-type: none"> • Bhattacharjee Ch 5, 34 - 40 • Jhangiani et al., Ch. 5, 113 - 141
Tues 2/13	Sampling & power; Measurement theory, scale reliability & validity	Quiz 1 Due <ul style="list-style-type: none"> • Bhattacharjee, Ch 6-8, 41 - 70 • Jhangiani et al., Ch 4, 87 - 107
Tues 2/20	Experimental research designs; Factorial design	<ul style="list-style-type: none"> • Gravetter & Forzano, Ch.8 & 9, 185 - 236 • Jhangiani et al., Ch 9, 221 - 236
Tues 2/27	Non-experimental and quasi-experimental research design	<ul style="list-style-type: none"> • Jhangiani et al., Ch. 6, 145 - 180 • Gravetter & Forzano, Ch. 10, 237 - 264
Tues 3/5	Spring break, no class	
Tues 3/12	Survey research	Final project proposals due <ul style="list-style-type: none"> • Jhangiani et al., Ch. 7, 185 - 202 • Visser et al., Ch 9, 223 - 252
Issues in Experimental Research		
Tues 3/19	Challenges in research; Bias in Experimental Research	Quiz 2 Due <ul style="list-style-type: none"> • May, 2021, Synthese, 199: 3345–3366

Tues 3/26	Research ethics; Proposal development & feedback	<ul style="list-style-type: none"> • https://www.newyorker.com/magazine/2023/10/09/they-studied-dishonesty-was-their-work-a-lie • Jhangiani et al., Ch. 3 Research Ethics, 61-83
Tues 4/2	Open science and reproducibility	Final project outlines due <ul style="list-style-type: none"> • Lahiri, Ch 14, Crises of Replication • Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-positive psychology: Undisclosed flexibility in data collection and analysis allows presenting anything as significant. Psychological Science, 22(11), 1359-1366. • Nelson, L. D., Simmons, J., & Simonsohn, U. (2018). Psychology's renaissance. Annual review of psychology, 69, 511-534. • Additional (optional) readings: • https://www.vox.com/future-perfect/21504366/science-replication-crisis-peer-review-statistics • https://www.nature.com/articles/d41586-023-03486-5
Analyzing and Disseminating Research		
Tues 4/9	Basic descriptive and inferential statistics	Quiz 3 Due <ul style="list-style-type: none"> • Jhangiani et al., Ch 12-13, 293 - 361 • Gravetter & Forzano, Ch.15, 373 - 420
Tues 4/16	Presenting your research; Final project peer feedback	<ul style="list-style-type: none"> • Jhangiani et al., Ch 11, 259 - 290 • Gravetter & Forzano, Ch. 16, 421 - 447
Tues 4/23	Overflow day	Quiz 4 Due; Final project drafts due

Tues 4/30	Final project presentations	Final Project Paper & Presentation Due