

Psychology 1901 – Methods of Behavioral Research

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Lecture Pre-recorded; please watch 1-2 days before discussion

Discussion Mondays 1:30 pm – 2:45pm EST, WJH B1

Labs Wednesdays, WJH [Rooms TBD]
12:00 – 1:00
1:30 – 2:30 (two separate sections at this time)
3:00 – 4:00

Course website: <https://canvas.harvard.edu/courses/136936>

Course description and goals

We love teaching this course. First, it's often one of few courses in which you have to explore not only what to think but *how* to think: How do you generate a hypothesis? How do you decide whether an inference is valid? Whether an idea is worth testing? Second, we firmly believe there is no pedagogical substitute for conducting your own research. This is why we insist on (i) the lab component of the course and (ii) requiring you to run your own experiments. You're all incredibly adept at sniffing out flaws in other researchers' logic, identifying weaknesses in others' experimental designs, but the point of this class is to challenge you. Every design decision boils down to a cost-benefit tradeoff. How do you know if you're making the right choice? Approach A has problem B, but approach Y has problem Z. Together we'll struggle with not getting it "right," with not knowing if your experiment is going to "work." And together we'll acknowledge that even if your experiment *does* work you haven't proven anything—you're just not wrong *yet*. But we relish this, because you're learning (by doing) precisely how science proceeds. This is the grey area where one can never be sure they're right. Our goal is that by the end of each semester you are ever-so-slightly more comfortable in this space.

Therefore, this course is designed to

- enhance your understanding of how psychologists develop research questions
- teach you how to design experiments to test these questions
- get you questioning what constitutes a valid inference from a set of results
- give you hands-on experience conducting psychological research: specifically, together you will develop, execute, and report the findings of your own psychological experiment

This course includes pre-recorded lectures, in-class discussions, and in-class laboratory sections to achieve these ambitious goals. The lecture and discussion portions of the course will focus on the fundamentals of causal inference and conducting psychological research. The laboratory portion will focus on building practical research skills, including the ability to critically review scientific research and claims, formulate hypotheses and research proposals, conduct a collaborative study, analyze data using intermediate statistical techniques, as well as write up

and present results. By the end of the course, you will have a deeper understanding of how psychological science proceeds and the challenges inherent in carrying out and evaluating empirical research.

Course policies and expectations

Enrollment/pre-requisites: We plan not to cap enrollment or enforce any prerequisites except for Psychology 1, SLS 20, or their AP/IB equivalents. ***Taking a stats class (e.g., PSY 1900) either prior to, or concurrent with 1901 is now also required (trust us on this one).***

Attendance: Attendance and participation in lab meetings are obligatory. Attendance to discussions are strongly recommended. We expect you to be in class every meeting, to show up on time, to stay for the full class period, and to be an active learner.

Failure to attend lab meetings (without prior notification) will impede your ability to complete a high-quality final project. Furthermore, missing lab places undue burden your other research group members. Please maintain contact with your respective groups over the course of the entire semester. Failure to do so will also negatively impact your participation grade.

Excused absences: You will be excused from discussion and lab meeting for family and medical emergencies; no documentation is required. Please just let us know as soon as possible via Slack or email that you will be (or were) absent so we can direct you to the proper resources to keep you on track.

Late assignments: Late homework assignments will be penalized by one point each day they're late unless you request an extension from us via Slack or email. *You can do this for up to one assignment:* Please send your request by the day before the due date. No documentation or explanation is necessary for an extension; all you have to do is ask! After one extension we will simply take off a point for each day an assignment is late.

Discussion and lab participation: Discussion and lab meetings will be a blend of whole group conversations and smaller break-out group conversations. Please also note that we may call on people to share their discussion questions/comments based on the readings.

Software: You will use R and/or Microsoft Excel in lab; you can obtain site licenses from the University.

Our pledge: We will do our best to answer emails and Slack messages within 48 hours (usually less than that) and will return papers and other assignments within a week. For planning purposes please know that emails/messages sent during the week will likely receive responses more quickly than emails/messages sent over weekends.

Disclaimer: Please note that the syllabus and schedule are subject to change! We will announce updates and you will be able to download new versions of the syllabus from Canvas.

Integrating the lecture content with these readings will serve as the basis for our weekly discussions. See the course schedule below for weekly reading assignments. Articles marked with an asterisk are resources but **are not required** reading. **If no pages are mentioned in the course schedule, please read the entire article. Where there are pages specified please read those pages.** All articles are available for download on Canvas:

- Bem, D. (2003). Writing the empirical journal. *The compleat academic: A practical guide for the beginning social scientist* (2nd Ed.), 171.
- Borenstein, M. (2012). Effect size estimation. In H. Cooper, P. Camic, D. Long, A. T. Panter, D. Rindskopf & K. Sher (Eds.), *APA handbook of research methods in psychology* (Vol. 3, 131-146). Washington, DC: APA Books.
- Cacioppo, J. T., Semin, G. R., & Berntson, G. G. (2004). Realism, instrumentalism, and scientific symbiosis: psychological theory as a search for truth and the discovery of solutions. *American Psychologist*, 59(4), 214.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112, 155-159.
- Farah, M. J., & Hook, C. J. (2013). The seductive allure of "seductive allure". *Perspectives on Psychological Science*, 8, 88-90.
- Goldin, R. (2009). Spinning heads and spinning news: How a lack of statistical proficiency affects media coverage. *JSM-Section on Statistical Education*, 3890-3896.
- Henrich, J., Heine, S. J., & Norenzayan, A. (2010). Most people are not WEIRD. *Nature*, 466 (7302), 29-29.
- Heyman, R. E., Lorber, M. F., Eddy, M., & West, T. (2014). Behavioral observation and coding. In H. T. Reis & C. M. Judd (eds.), *Handbook of research methods in social and personality psychology*, 2nd Ed. (pp. 345-372). New York, NY: Cambridge University Press.
- John, O. P., & Benet-Martinez, V. (2014). Measurement: Reliability, construct validation, and scale construction. In H. T. Reis & C. M. Judd (eds.), *Handbook of research methods in social and personality psychology*, 2nd Ed. (pp. 473-504). New York, NY: Cambridge University Press.
- Kerr, N. L. (1998). HARKing: Hypothesizing after the results are known. *Personality and Social Psychology Review*, 2, 196-217.
- *Krosnick, J. A., & Presser, S. (2010). Question and questionnaire design. In P. V. Mardsen and J. D. Wright (Eds.), *Handbook of survey design* (pp. 263-313). Bingley, UK: Emerald Group Publishing.
- *Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: a practical primer for t-tests and ANOVAs. *Frontiers in Psychology*, 4.
- Milkman, K. L., & Berger, J. (2014). The science of sharing and the sharing of science. *Proceedings of the National Academy of Sciences*, 111, 13642-13649.
- Mook, D. G. (1983). In defense of external invalidity. *American Psychologist*, 38, 379-387.
- Oppenheimer, D. M., Meyvis, T., & Davidenko, N. (2009). Instructional manipulation checks: Detecting satisficing to increase statistical power. *Journal of Experimental Social Psychology*, 45(4), 867-872.
- Pashler, H., & Harris, C. R. (2012). Is the replicability crisis overblown? Three arguments examined. *Perspectives on Psychological Science*, 7, 531-536.
- Schönbrodt, F. D., & Perugini, M. (2013). At what sample size do correlations stabilize? *Journal of Research in Personality*, 47 (5), 609-612.
- Schwarz, N. (1999). Self-reports: How the questions shape the answers. *American Psychologist*, 54, 93-105.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). Quasi-experiments that either lack a control group or lack pretest observations on the outcome. Experimental and quasi-

- experimental designs for generalized causal inference. (Chapter 4, pp. 103-134). Boston, MA: Houghton Mifflin.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). Randomized experiments: Rationale, designs, and conditions conducive to doing them. *Experimental and quasi-experimental designs for generalized causal inference*. (Chapter 8, pp. 246-278). Boston, MA: Houghton Mifflin.
- Simmons, J., Nelson, L., & Simonsohn, U. (2011). False positive psychology: Undisclosed flexibility in data collection and analysis allows presenting anything as significant. *Psychological Science*, 22, 1359-1366.
- Stewart, N., Chandler, J., & Paolacci, G. (2017). Crowdsourcing samples in cognitive science. *Trends in Cognitive Sciences*.
- Weisberg, D. S., Keil, F. C., Goodstein, J., Rawson, E., & Gray, J. R. (2008). The seductive allure of neuroscience explanations. *Journal of Cognitive Neuroscience*, 20, 470-477.

Research project

The research project will be the central focus of the class. Much of the course grade will come from various components of this project. We will provide more details in advance of each assignment on Canvas.

Near the beginning of the semester, you will band together into groups of two to three and select research topics. Each group will carry out a research project on their topic of choice. We will provide each group with \$50 to conduct the study; these funds can be used in any manner necessary with the exception of paying participants in cash. Note that some graded aspects of this project will be completed as a team (e.g., the final presentation) whereas others will be completed individually (e.g., the final paper). Please see the next section for further detail.

Course evaluation

Lecture quizzes (5% of grade, individual grade): There will be brief quizzes interspersed throughout the pre-recorded lecture modules to help keep you engaged. You will not be graded on whether your answers are correct (that is just to help you gauge how well you're following along); you will receive full credit just for completing them. ***Please watch lectures in Chrome; the quizzes don't appear in other browsers for some unknown reason!***

Homework assignments (25% of grade, group or individual grade depending on assignment): Over the course of the semester, you will complete five homework assignments, worth 5 percentage points each. Except where noted, these assignments are to be completed individually. Due dates are listed in the course schedule at the end of this syllabus. Assignments are due by 11:59 pm EST on the specified date. A brief description of each assignment appears below:

Article summary and evaluation assignment (individual grade): Once you have identified topics for your research projects, each of you will select a relevant article. After reading this article, you will write a concise summary of it and provide a thorough critique. This assignment will help get you and your group up to speed on the relevant background research so that you can begin designing your own study.

Experiment development assignment (group grade): Research groups will work together to generate hypotheses and an experimental design they would be interested in

pursuing for their final project. Groups will also have to (i) identify the independent and dependent variables they intent to study (ii) discuss the ethicality and appropriateness of different methods for testing their hypotheses. This is a collaborative homework assignment; all team members will receive the same grade.

Research proposal (individual grade): Each of you will write a detailed research proposal that includes background information leading to predictions, operationalization of all study variables, and a full description of methods and procedures. Note that in contrast to the previous assignment, this document should more closely approximate the introduction and methods sections of the paper draft. We will provide a template for this assignment.

Research paper draft (individual grade): Please note that this is the only paper draft that the instructors will read and comment on. Thus, it is in your best interest to take full advantage of this feedback opportunity by submitting a draft that is as close to complete as possible. These drafts will not be graded; the primary goal is to provide you with preliminary feedback to improve the final project write-up. We will provide feedback to students during the final week of class, leaving approximately one week before the final paper is due for revisions. Please note that addressing our suggestions and comments will improve the paper grade, but will not guarantee an A.

Science advocacy on social media (individual grade): This assignment incorporates communications and advocacy based on your research project. Social media platforms play a critical role in communications, information dissemination, and advocacy. The most effective social media posts are short and succinct, and they are written with a general audience in mind. The art of writing for social media is a powerful skill and developing scientists must have the ability to communicate their findings and those implications to a wide audience. This is your chance to practice that skill based on what you discover! (assignment adapted from Professor Flavia Peréa)

Exam (20% of grade, individual grade): This is timed and open book, but you must complete the exam on your own. All lecture material, readings, and lab activities completed up until this point constitute fair game for the exam. Please let us know as soon as possible if you think you may not be able to take the exam at the scheduled time (please see course schedule below) and we'll arrange alternative accommodations.

Final paper (25% of grade, individual grade): Each of you will submit a complete, APA formatted paper describing the research project your group worked on (see course schedule for due date). All papers must include the following sections: title page, abstract, introduction, methods, results, discussion, and references (see Rubric on Canvas). Papers must also include at least one table and one figure depicting the study's central finding. This paper must be approximately 12 pages long (not including title page, abstract, references, tables or figures) and is expected to mirror an article from a scientific journal. Please be aware that grading for the final paper hinges on more than just following formatting guidelines and writing well. Grades will also reflect the appropriateness of the study's methods and analyses, as well as the overall level of creativity, ambition, and critical thought put into the project itself. You will have access to the grading rubric early in the semester to help you plan.

Final presentation (10% of grade, group grade): Each research team will present their study to the class at their last lab meeting by giving a ~15 minute slide presentation. Each member of

the research team should present a portion of the talk, but everyone should be prepared to give the entire talk and to answer audience questions. All members of a given research team will receive the same grade for their presentation.

Participation (15% of grade, individual grade): Each of you will receive a participation grade that takes into account:

- (i) attendance to and involvement in weekly lab meetings;
- (ii) posting replies to weekly discussion prompts on Slack (see below); and
- (iii) sustained, equal involvement in your research group's project

Therefore, this score is based upon the number of labs you attend and the number of discussion prompt replies you write. I will also solicit feedback from the TFs as well as each student in your research group to determine (iii). Keep in mind that this is an individual grade, meaning that students within the same research team may receive different participation scores.

Weekly discussion posts. Weekly discussion responses should be **submitted on Slack** (accessible via Canvas) to the appropriate channel by **8:00 pm EST each SUNDAY** before discussion. Each question/comment should make a connection between the pre-recorded lecture and that week's readings as well as some real world event or things you have learned in other classes.

Summary of grade components

Grade scale

Lecture quizzes	5%	A = 93-100%	C = 73-76.99%
Homework	25%	A- = 90-92.99%	C- = 70-72.99%
Exam	15%	B+ = 87-89.99%	D+ = 67-69.99%
Final paper	25%	B = 83-86.99%	D = 63-66.99%
Final presentation	10%	B- = 80-82.99%	D- = 60-62.99%
Participation	20%	C+ = 77-79.99%	E = less than 60%

Academic Integrity

Collaboration policy: Research is an inherently collaborative enterprise; however, assignments in this course are a mix of collaborative and individual efforts. In the Course Evaluation section above, we have identified which assignments will be evaluated at the group and individual levels, respectively. If the assignment is for a group grade (e.g., the final presentation), you are expected to consult with the members of your group and contribute proportionately to the final submitted product. We expect open collaboration in these cases. If, however, the assignment is for an individual grade (e.g., the final paper), you should complete the assignment independently. Collaboration is prohibited in these cases.

You will be able to select your group for the major research project. We expect you to communicate and work actively with your fellow group members. Please note that you will have ample time in lab to work on your projects; however, you may also need to meet outside of lab on a few occasions. Groups may all work together on each component of a group project or divide the work evenly, but all group members **should contribute equally to all group-evaluated projects**. For assignments that have a group grade, you will be required to submit a contribution statement. This will be a short paragraph detailing what each group member

contributed (similar to what many journals require of their authors). An example and more details will be provided before the relevant assignments. In cases where one group member does less (or more) work than other group members, we reserve the right to give an individual an individual grade rather than the grade given to the rest of the group.

Plagiarism: Plagiarism or any other type of academic dishonesty **will not be tolerated**. All assignments must reflect your own (or your group's) work. Whenever you communicate ideas that are not your own—including AI sources—you must give proper attribution. Failure to do so constitutes an academic integrity violation.

Do not hesitate to cite or quote other researchers' work in your papers and presentations—we expect that you will do so! Remember that any given research paper in the field will likely cite dozens of preceding articles (some may cite in excess of 50 or 100). These citations are vital because they enhance and lend credibility to scientific arguments.

Keep the following in mind throughout the semester:

- A) When including other peoples' research results, ideas, or arguments in the paper, you should put them in their own words and include a citation to the original source. Direct quotes are permissible, but should be used sparingly. When using a direct quote, be sure to put the text in quotation marks and include a page number in the citation.
- B) Always cite the source (including AI) of any research results, idea, or argument that is not entirely original, even if it has been significantly reworded. Changing working order, inserting additional punctuation, and/or replacing words with synonyms does not count. Plagiarized or improperly cited work may result in grading penalties and disciplinary action.

For more information on how to cite others' work, please consult the Harvard Guide to Using Sources:

<http://usingsources.fas.harvard.edu/icb/icb.do>

For more information on academic integrity, please consult the FAS Handbook for Students:

<http://handbook.fas.harvard.edu/icb/icb.do?keyword=k79903&pageid=icb.page418752>

Academic Accommodations

Any student needing academic adjustments or accommodations is requested to present their letter from the Accessible Education Office (AEO) and speak with the instructors by the end of the second week of the term. Failure to do so may result in the instructor's inability to respond in a timely manner. All discussions will remain confidential, although AEO may be consulted to discuss appropriate implementation. *Please contact Professor Cikara one week before the exam to set up time accommodations.*

Mtg	Week	Readings (to be completed BEFORE Lecture + Discussion)	Lecture Topic (watch BEFORE discussion)	Discussion (Mondays)	Lab Topic (Wednesdays)	Homework
1	9/9	Cacioppo et al. (2004); Gray & Wegner (2013)	Good Research		How to develop hypotheses	
2	9/16	John & Benet-Martinez (2014), p. 1-29 ; Schwarz (1999)	Operationalization, validity + reliability		Survey design + evaluation	Upload CITI cert
3	9/23	Cohen (1992); Borenstein (2012); Schönbrodt & Perugini (2012)	Statistics review		Statistics exercise	
4	9/30	Bem (2003), p. 2-3 ; Kerr (1998); Simmons et al. (2011); Harris & Pashler (2012)	Statistical and research ethics		Stats exercise cont'd; Ethics debate	Article summary and evaluation
5	10/7	Shadish et al. (2002) Ch. 8, p. 246-257 ; Mook (1983)	Experiments I		Project construction: Break into teams, develop research idea, literature review	Experiment development
6	10/14			NO DISCUSSION: Indigenous People's	Qualtrics + Prolific (if time)	
7	10/21	Henrich et al. (2010); Stewart et al. (2017); Oppenheimer et al. (2009)	Experiments II		Project construction: Developing materials, methods, and supporting documents	Research proposal
8	10/28	Shadish et al. (2002) Ch 4, p. 103-128 ; Heyman et al. (2014), p. 5-19	Non-randomized design		Dry run of study; initial data collection	
9	11/4			EXAM	NO LAB: Time for final data collection	
10	11/11	Weisberg et al. (2008); Farrah et al. (2013)	Physio methods		Data analysis and preparations of tables + figures	
11	11/18	APA checklist (Morling)	Effective papers and presentations		Final data analysis + interpretation; start preparing presentation	
12	11/25	Milkman & Berger (2014); Goldin (2009)	Popular press coverage of psych science		NO LAB: Thanksgiving	Research paper draft
13	12/2	Schwartz (2008)	Semester debrief		Research Presentations!	Science advocacy via

FINAL PAPER IS DUE TBD

We trust you all to organize your schedules but this course has a lot of moving parts. In case it's helpful, we have sketched out a weekly timeline template to help us all make sure we don't miss any meetings/readings/assignments.

STUDENTS ON THEIR OWN

Submit
discussion post
by 8:00 pm
EST

Start on
assignment if
one is due this
Friday

Watch
lecture for
next week;
start reading

Continue
readings;
submit
assignment?

STUDENTS WITH OTHERS

Discussion +
office hours

Lab Sections
1-4

Sunday

Monday

Tuesday

Wednesday

Thursday

Friday

Saturday