

PSYC1495: Research Methods: Data Science, Justice, and Social Change
Fall 2026

Interactive, web-based version of this syllabus: <https://psyc1495f26.netlify.app/>

Course Information

Research Methods: Data Science, Justice, and Social Change

Mondays and Wednesdays, 2:10-4pm

Mondays: Schermerhorn 200B

Wednesdays: Schermerhorn 200C

Instructor Information

Dr. Ben Silver

He/him/his

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Office hours: Mondays 11am-1pm, Sch 219

Learning Objectives

1. Students will learn the basic principles of designing a research study, including how to form questions and hypotheses, how to operationalize variables, how to determine experimental validity, how to identify sources of error, and how to interpret results.
2. Students will learn how to use psychological theory to interpret and analyze data; in particular, how administrative datasets and/or “found” data – especially those surrounding social issues such as the criminal justice system, poverty, and public health disparities – through the lens of human behavior can help inform policy changes and bring about meaningful and just societal change. Students will also learn how to integrate “close to the problem” expertise into problem solving, as well as how data may be misused in ways that perpetuate inequality or injustice.
3. Students will learn how to analyze data using R Studio, including identifying relevant datasets, cleaning data, summarizing data, running statistical models, and data visualization. Students will also learn how to integrate generative AI tools into data analysis pipelines in order to bolster research skills.

Course description

This course will provide the rigorous data science training and core content knowledge students need to use data science to effect policy changes that promote a more just society. We will explore these topics using readings, class discussions, guest speakers, and data analysis practice. The course will leverage the academic expertise of psychologists, lawyers, and data scientists; the perspectives and experiences of community members and students affiliated with the Center for Justice; and policymakers from government agencies and community organizations.

The focus will be on collaborating with community and government organizations to propose data- and psychology-informed solutions that center on those most impacted by failures of the justice system. Students will learn how to promote a more just society through combining data, disciplinary knowledge, and fine-grained, on-the-ground experience. They will learn how to approach policy-relevant data with an explicit justice mindset such that they consider the implications of specific policies for achieving a more just, racially equitable outcome.

Role in the Psychology curriculum

Students are increasingly interested in connecting academics with data-informed action. The work of the Center for Justice with communities and city and government agencies makes clear the value of educating students in how to use data to inform the transformation of law, policy and institutional practices. This course is an essential step in broadening our curricular offering to prepare undergraduates for the burgeoning interest in connecting psychology and neuroscience with public policy and law, and providing undergraduates the data science training they need to go on to graduate study, careers in public policy, etc.

This course is designed to give undergraduates an opportunity to learn about psychology research methods associated with data science research for social change. It is a research methods course with separate sections for lecture and lab. (Please be sure you are registered for both PSYC1495 and PSYC1496.) This is a 4-credit course.

- For the Psychology Major and the Postbac Certificate Program in Psychology, PSYC UN1495 can fulfill the Research Methods requirement.
- For the Neuroscience and Behavior Major, PSYC UN1495 can fulfill the P3 requirement.

Prerequisite: At least one previous psychology course AND an introductory statistics course. Please reach out to instructor if you do not meet these prerequisites but would like to take the course. Please note that previous coding or data science experience is NOT required to take this course.

Assignments

Lab assignments (25 points)

There will be 6 lab assignments throughout the semester, which will be coding exercises due before lab on Wednesdays. These labs are designed to help you apply what we've learned in class and to guide you through the process of conducting a psychology research project with found data. Each assignment is worth 5 points. There will be 6 assignments, but you will only be responsible for completing 5 of them, worth 25 points in total. This means you may skip one with no penalty, or drop your lowest grade. All assignments will be completed in R Studio, which you

will learn how to use in class. (Note: Prior knowledge of coding is NOT a prerequisite for this course. You will learn the skills you need in class to help you complete these assignments.)

Reading quizzes (25 points)

There will be 6 reading quizzes throughout the semester, to be completed in class on Mondays. The reading quizzes are designed to test your knowledge of basic research methods concepts, as outlined in the textbook readings. However, they will require you to apply and extend these concepts to research in the context of justice and public policy. Each quiz is worth 5 points. There will be 6 quizzes, but you will only be responsible for completing 5 of them, worth 25 points in total. This means you may skip one with no penalty, or drop your lowest grade.

Final policy presentation (10 points)

Throughout the semester, you will conduct a research project using found data. The project must link psychological theory with social/policy change, and you will analyze data to make your case. You have the option to do this project alone or with a partner. At the end of the semester, you will give a final presentation structured for a policy audience. The goal of this presentation will be to summarize your findings in an easily digestible way with the purpose of affecting policy. Presentations will be 10 minutes long and will take place on 12/9 and 12/14.

Final research paper (15 points)

In addition to your presentation, you will also write up your project in a 10-15 page academic research paper. Regardless of if you work with a partner on the research project, you will write *your own* research paper. The paper should follow APA format with an introduction to the topic that includes some background literature, a detailed methods section, a thorough results section (including statistical analyses and visualizations), and a concise discussion. The final paper is due on 12/21, and a project outline is due on 11/18.

Participation reflection (3 points)

Midway through the course, you will write a reflection (250-500 words) on how you think you are doing in your participation in the course. You should use the participation rubric to help you write your reflection. I will give you feedback on your reflection about where I agree and disagree. The purpose of this assignment is for you to be honest with yourself about your relationship to the course while also getting a concrete sense from me about how are you doing. You will receive full credit on this assignment if your reflection touches on all aspects of the participation rubric.

Syllabus quiz (4 points)

Please complete a syllabus quiz on Canvas by the night before the second day of class. The purpose of this quiz is to ensure that you have familiarized yourself with

the course assignments and policies. You may reference the syllabus when taking the quiz.

Assignment breakdown

Lab assignments: 25%

Reading quizzes: 25%

Final research presentation: 10%

Final research paper: 15%

Participation: 18%

Participation reflection: 3%

Syllabus quiz: 4%

Course Policies

Participation (18 points)

Participation is a vague term that means something different to every instructor, and yet it is incredibly important in a class such as this. For the purposes of this class, participation is evidence that you are engaging with the readings and the class material. This evidence can occur in a number of ways. First, it means being an active and considerate member of full class discussions. (Active means you step up and share your thoughts, considerate means you step back and not take up too much space.) It also means completing in-class activities and coding tutorials. It also means submitting assignments on time and communicating with me, as well as engaging with my feedback and incorporating it into your assignments.

Participation is important in this course because it is our way of constructing collective meaning of this material. Your own experiences and opinions will inform how we interpret class readings and assignments.

Finally, participation is part of your grade. However you choose to engage with the material, it is my expectation that you will do so in a way that positively contributes to your classmates' experience in this course. Your participation will be assessed based on the class participation rubric. Midway through the semester, I will ask you to submit a reflection on how you think you are doing regarding participation: where you are doing well, and where you can improve. I will provide you with feedback on this reflection to indicate if your assessment aligns with mine. At the end of the semester, I will provide you with a participation grade based on the rubric.

Attendance and lateness

Above anything else, I value clear communication. I'm understanding that school is not your entire life and that life sometimes gets in the way of school. But I ask that you clearly communicate with me when this happens, or when you anticipate it happening. Extra-curricular conflicts are sometimes unavoidable, but your

communication demonstrates to me that you are committed to engaging with this course. For both attendance and late assignments, my policies are similar:

Attendance is expected at every class. If you are unable to make class one week, all I ask is that you let me know at least 24 hours in advance. If you are absent from class and have not let me know in advance, your participation grade will be impacted because we will not have had a chance to plan ahead for your absence. In addition, frequent absences (greater than 4), even with advanced notice, will also impact your participation grade, as it will prevent you from consistently participating in class discussions and in-class activities.

On-time assignments are always expected. If an assignment will be late, or you need an extension, please let me know as far in advance as possible. Extensions are never guaranteed. Unless otherwise noted, if an assignment is late and you have not let me know in advance, you will receive -10% for every 12 hours that it is late.

Academic integrity

All work should be your own. Don't plagiarize, either from your friend or from a random person online. There are NO exceptions to this rule, under any circumstances. If you are having trouble with an assignment or need more time, talk to me. I'm happy to help, and I'd much rather spend my time helping you than reporting you to the university for plagiarizing or cheating. I promise you, it's never worth it to plagiarize – just don't do it! In addition, finding shortcuts to putting in the work required of this class – doing the readings, completing your assignments – will defeat the purpose of taking this class, which is to learn and think critically about new ideas. If you complete assignments via plagiarism rather than with your own thoughts, you're probably not going to learn very much.

For more information on Columbia's policies on academic integrity, please see here: <http://www.college.columbia.edu/academics/academicintegrity>.

Note on generative AI: You **may not** use generative AI chatbots, such as ChatGPT, Claude, or Gemini, to complete your written assignments. Ever. At all. The purpose of this course is not to complete assignments; rather, the purpose is to put in the work of critically thinking about the ideas discussed. In short, you will not learn very much if you outsource all of your thinking to generative AI, and where is the fun in that?

I also understand that students often resort to using AI when they are pressed for time. *I would rather you hand in your own work late than an AI's work on time.* If you are concerned about your ability to hand in an assignment on time, just let me know, and we can discuss.

If you are caught using AI once, you will receive a 0 on that assignment and will have a meeting with me, where I'll make you feel guilty for disrespecting me, my time, and your classmates' time. If you are caught using AI a second time, we will have another meeting where we'll discuss your academic integrity for the course and its impact on your grade. (Hint: That will not be a fun meeting.)

Having said all of that, you may use AI to help you with lab assignments and data analysis for your final project. In fact, we will learn best practices for using generative AI for coding, and will learn how to use it to enhance our analyses.

Student-generated policies

Discussion norms: We will spend some time on the first day of class crafting class discussion norms to ensure that everyone feels welcome in our class space, and to ensure that we have shared expectations of what class discussions should look like. Those discussion norms will go here in an updated draft of the syllabus.

Computer policy: For most students, computers are essential for note-taking and reading. However, using computers in class can be distracting for you and for others. On the first day of class, we will create community norms around computer use. Those norms will go here in an updated draft of the syllabus.

Diversity and inclusion

It is extremely important to me that our classroom environment is welcoming and inclusive of everyone, regardless of race, gender, class, sexuality, religion, or country of origin. Please recognize that everyone comes to the table with different life experiences: What you take for granted might be something that someone else knows nothing about, and what is unfamiliar to you might be easily understood to others. Use "I" statements when speaking and don't generalize about groups of people with a particular identity. Assume good intent from your classmates during class discussions. Be respectful.

I will do my best to foster an inclusive environment over the course of the semester, where all students feel a sense of belonging. Of course, I, like anyone, have biases based on my own experiences. Please do not hesitate to reach out to me if something was said in class, either by me or by another student, that made you feel uncomfortable. My goal is to create a sense of community in our class. I hope we will all be open to difficult conversations.

Disability accommodations: If you require special accommodations through the Office of Disability Services (ODS) or the Center for Accessibility Resources and Disability Services (CARDS), please let me know as close to the beginning of the semester as possible. More information about registering with ODS can be found here: <https://www.health.columbia.edu/content/disability-services>

Student wellness: Academic life can be exceptionally challenging at times. The intention of this course is to enhance your life, not make it miserable. Please always prioritize your health. If you're ever having a tough time, and it's impacting your ability to fully participate in the course, please reach out, and we can figure something out together. The university also has many health and wellness resources available for students:

- <https://www.health.columbia.edu/content/counseling-and-psychological-services-directory>
- <https://universitylife.columbia.edu/resource-directory>

Course Calendar

Reading quizzes are completed in class on Mondays and lab assignments are due on Wednesdays. Any other assignment due dates are noted in the schedule below.

Monday (Lecture)	Wednesday (Lab)
	9/9 Intro to course Linking data and justice
9/14 Research ethics and data misuse <i>Syllabus quiz due</i>	9/16 Coding basics
9/21 Finding a research question and crafting a hypothesis <i>Reading quiz #1 in class</i>	9/23 Data manipulation
9/28 Variables and experimental design <i>Reading quiz #2 in class</i>	9/30 Data cleaning <i>Lab assignment #1 due</i>
10/5 Non-experimental methods <i>Reading quiz #3 in class</i>	10/7 Data visualization
10/12 Validity, reliability, and measurement <i>Reading quiz #4 in class</i>	10/14 Geospatial data and maps <i>Lab assignment #2 due</i>
10/19 Interventions and quasi-experiments <i>Participation reflection due</i>	10/21 Text data <i>Lab assignment #3 due</i>
10/26 Making sense of results <i>Reading quiz #5 in class</i>	10/28 Web scraping <i>Lab assignment #4 due</i>

11/2 Making sense of results <i>Reading quiz #6 in class</i>	11/4 Data analysis <i>Lab assignment #5 due</i>
11/9 FALL BREAK	11/11 Advanced analysis and visualization <i>Lab assignment #6 due</i>
11/16 Qualitative methods	11/18 Advanced analysis and visualization <i>Final project outline due</i>
11/23 Research replicability and bias in data	11/25 THANKSGIVING BREAK
11/30 Science communication and data journalism	12/2 Work on projects
12/7 Work on projects	12/9 Policy presentations <i>Policy presentation due</i>
12/14 Policy presentations	
12/21 <i>Final research paper due</i>	

Readings

We'll be using two textbooks throughout this course.

Jhangiani, R. S., Cuttler, C., & Leighton, D. C. (2019). *Research Methods in Psychology* (4th ed.). Kwantlen Polytechnic University.
<https://kpu.pressbooks.pub/psychmethods4e/>

Frank, M. C., Braginsky, M., Cachia, J., Coles, N. A., Hardwicke, T. E., Hawkins, R. D., Mathur, M. B., & Williams, R. 2025. *Experimentology: An Open Science Approach to Experimental Psychology Methods*. Stanford University.
<https://doi.org/10.25936/3JP6-5M50>.

Both textbooks are open-source, meaning they're freely available. You can download them as PDFs or read them online.

All readings are to be completed by the date listed. Readings are subject to change.

9/14: Research ethics and data misuse

- Jhangiani, Ch. 3

- Herington, J., Li, K., & Pisani, A. R. (2024). Expanding the role of justice in secondary research using digital psychological data. *American Psychologist*, 79(1), 123–136. <https://doi.org/10.1037/amp0001190>
- Kosinski, M., Stillwell, D., & Graepel, T. (2013). Private traits and attributes are predictable from digital records of human behavior. *Proceedings of the National Academy of Sciences*, 110(15), 5802–5805. <https://doi.org/10.1073/pnas.1218772110>

9/21: Finding a research question

- Jhangiani, Ch. 2.9, Ch. 2.10, Ch. 2.11
- Frank, Ch. 2
- P. Sharkey. (2010). The acute effect of local homicides on children's cognitive performance, *Proc. Natl. Acad. Sci. U.S.A.* 107(26), 11733-11738, <https://doi.org/10.1073/pnas.1000690107>

9/28: Variables and experimental design

- Jhangiani, Ch. 5
- Frank, Ch. 1
- J.P. Goyer, J. Garcia, V. Purdie-Vaughns, K.R. Binning, J.E. Cook, S.L. Reeves, N. Apfel, S. Taborsky-Barba, D.K. Sherman, & G.L. Cohen. (2017). Self-affirmation facilitates minority middle schoolers' progress along college trajectories, *Proc. Natl. Acad. Sci. U.S.A.* 114(29), 7594-7599, <https://doi.org/10.1073/pnas.1617923114>

10/5: Non-experimental methods

- Jhangiani, Ch. 6
- Richmond-Rakerd, L. S., Dent, K. R., Andersen, S. H., D'Souza, S., & Milne, B. J. (2024). Population-Level Administrative Data: A Resource to Advance Psychological Science. *Current Directions in Psychological Science*, 33(6), 361-370.
- Legewie J, Fagan J (2019). Aggressive policing and the educational performance of minority youth. *American Sociological Review* 84(2): 220-247. <https://doi.org/10.1177/0003122419826020>

10/12: Validity, reliability, and measurement

- Jhangiani, Ch. 4
- Frank, Ch. 8
- Holder, J., Calaff, I., Maricque, B., & Tran, V. C. (2022). Concentrated incarceration and the public-housing-to-prison pipeline in New York City neighborhoods. *Proceedings of the National Academy of Sciences*, 119(36). <https://doi.org/10.1073/pnas.2123201119>

10/19: Interventions and quasi-experiments

- Jhangiani, Ch. 7 and Ch. 8
- Matthay, E. C., Farkas, K., Rudolph, K. E., Zimmerman, S., Barragan, M., Goin, D. E., & Ahern, J. (2019). Firearm and nonfirearm violence after operation peacemaker fellowship in Richmond, California, 1996–2016. *American Journal of Public Health*, 109(11), 1605-1611. <https://doi.org/10.2105/AJPH.2019.305288>
- Voigt, R., Camp, N. P., Prabhakaran, V., Hamilton, W. L., Hetey, R. C., Griffiths, C. M., Jurgens, D., Jurafsky, D., & Eberhardt, J. L. (2017). Language from police body camera footage shows racial disparities in officer respect. *Proceedings of the*

National Academy of Sciences, 114(25), 6521–6526.
<https://doi.org/10.1073/pnas.1702413114>

10/26: Making sense of results

- Jhangiani, Ch. 9
- Frank, Ch. 6
- De Choudhury, M., & De, S. (2014). Mental Health Discourse on reddit: Self-Disclosure, Social Support, and Anonymity. *Proceedings of the International AAAI Conference on Web and Social Media*, 8(1), 71–80.
<https://doi.org/10.1609/icwsm.v8i1.14526>

11/2: Making sense of results

- Jhangiani, Ch. 12, Ch. 13
- Frank, Ch. 7
- Reddan, M. C., Garcia, S. B., Golarai, G., Eberhardt, J. L., & Zaki, J. (2024). Film intervention increases empathic understanding of formerly incarcerated people and support for criminal justice reform. *Proceedings of the National Academy of Sciences*, 121(44). <https://doi.org/10.1073/pnas.2322819121>

11/9: FALL BREAK

11/16: Qualitative methods

- Jhangiani, Ch. 10
- King, S. (2013). Early desistance narratives: A qualitative analysis of probationers' transitions towards desistance. *Punishment & Society*, 15(2), 147-165.
<https://doi.org/10.1177/1462474513477790>
- Maruna, S. (2001). Making good: The rhetoric of redemption. In S. Maruna, *Making good: How ex-convicts reform and rebuild their lives* (pp. 85–108). American Psychological Association. <https://doi-org.ezproxy.cul.columbia.edu/10.1037/10430-005>

11/23: Research replicability and bias in data

- Frank, Ch. 3
- Cathy O'Neil, *Weapons of Math Destruction* (2016). Intro, Ch. 5. (uploaded on Canvas)
- Hannah Fry, *Hello World* (2018). Justice. (uploaded on Canvas)

11/30: Science communication and data journalism

- Frank, Ch. 14 and Ch. 15
- Lewis Jr., N. A., & Wai, J. (2021). Communicating What We Know and What Isn't So: Science Communication in Psychology. *Perspectives on Psychological Science*, 16(6), 1242–1254. <https://doi.org/10.1177/1745691620964062>