PSYC1495: Research Methods: Data Science, Justice, and Social Change
Fall 2025

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: Tuesdays 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. Using specific examples from criminal, gender, racial, and environmental justice, students will learn through "doing": how to identify relevant administrative and other datasets; how to clean, integrate, analyze and learn from data; how to make and communicate the inferences and/or predictions; how to integrate close-to-the-problem expertise into problem solving; how to approach data and problem solving in ways that are consistent with justice values, where assumptions about data and statistical models are transparent; and how data can inform policy changes and bring about meaningful and just societal change.
3. Students will learn how data may be misused in ways that perpetuate racial inequalities and biases, how policies that rely on gut-instinct and opinion can perpetuate injustice and structural racism (e.g., the policies that generated mass incarceration). Thus, students will learn to adopt a critical approach to data and policy formulation and to be vigilant for unintended consequences of well-intentioned efforts when data are used without an understanding of context and history.

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 (24 points)

Each week after lab, you will be assigned a coding exercise due before lab (Wednesdays) the following week. 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. There will be 9 assignments, but you will only be responsible for completing 8 of them, worth 24 points in total. This means you may skip one with no penalty, or you can receive extra credit for the

extra assignment you complete. Students will receive 3 points for on-time assignments, 2 points for late assignments, and no points for incomplete assignments. All assignments will be completed via Posit Cloud, 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 (16 points)
There will be 9 reading quizzes throughout the semester, to be completed at home before the start of the class when the reading is due (Mondays). The reading quizzes are designed to test your knowledge of basic research methods concepts – as outlined in the textbook readings – and will be "open-book." However, they will require you to apply and extend these concepts to research in the context of justice and public policy. There will be 9 quizzes, but you will only be responsible for completing 8 of them, worth 16 points in total. This means you may skip one with no penalty, or you can receive extra credit for the extra quiz you complete. Each quiz is worth 2 points. Late quizzes will receive 0 points. All reading quizzes will be completed in a single Google doc. (See syllabus website for template.)

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 15 minutes long and will take place on 12/3 and 12/8.

Final research paper (20 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 12/15, and a project outline is due on 11/12.

Participation reflection (5 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 (5 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: 24%
Reading quizzes: 16%
Final research presentation: 10%
Final research paper: 20%
Participation: 20%
Participation reflection: 5%
Syllabus quiz: 5%

Course Policies

Participation
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 and 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 Chat-GPT 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 coding and data analysis for your final project. We will discuss use cases in class.

Student-generated policies

Discussion norms: Almost all of us have had the experience of being in a discussion seminar with someone who isn't a team player. Keep the following in mind during our discussions this semester:

- Be sure to use "I" statements, especially when discussing a topic that may be a point of disagreement with others in the class.
- Non-verbal communication is important. Make eye contact, don't make faces at things people say, and don't be on your phone while others are speaking (or really at all during class!).
- Be open to asking your peers questions, and to receiving answers from them.

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. Most students in our class feel neutral about the use of computers. To the extent that you're able, try to have your screen tilted down during discussions to facilitate eye contact and engagement.

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
- https://blogs.cuit.columbia.edu/nightline/
- https://universitylife.columbia.edu/student-resources-directory

Course Calendar

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

Monday (Lecture)	Wednesday (Lab)
	9/3 Intro to course Linking data and justice
9/8 Research ethics, data misuse *Syllabus quiz due*	9/10 Coding basics
9/15 Finding a research question	9/17 Data sources and data cleaning
9/22 Building an experiment: logic and principles	9/24 Web scraping
9/29 Non-experimental methods	10/1 Text data

10/6 Validity, confounds, and sources of error	10/8 Geospatial data and maps
10/13 Interventions *Participation reflection due*	10/15 Social network data
10/20 Causal processes	10/22 Data cleaning and data analysis
10/27 Individual differences	10/29 Data analysis
11/3 FALL BREAK	11/5 Data visualization
11/10 Narrative identity and change	11/12 Data visualization *Final project outline due*
11/17 Science communication for a general audience Data journalism	11/19 Work on projects
11/24 Bias in data and algorithms	11/26 THANKSGIVING BREAK
12/1 Work on projects	12/3 Policy presentations
12/8 Policy presentations	
12/15 *Final research paper due*	

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/

van Holm, E. (2021). *Introduction to Research Methods.* https://bookdown.org/ejvanholm/Textbook/

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

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

9/8: 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

9/15: Finding a research question

- Jhangiani, Ch. 2.9, Ch. 2.10, Ch. 2.11
- Van Holm, Ch. 2, Ch. 4
- 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

9/22: Building an experiment

- Jhangiani, Ch. 5
- Kahn, K.B. and Davies, P.G. (2017), What Influences Shooter Bias? The Effects of Suspect Race, Neighborhood, and Clothing on Decisions to Shoot. Journal of Social Issues, 73: 723-743. https://doi.org/10.1111/josi.12245

9/29: Non-experimental methods

- Jhangiani, Ch. 6
- van Holm, Ch. 8
- Babvey, P., Capela, F., Cappa, C., Lipizzi, C., Petrowski, N., & Ramirez-Marquez, J. (2021). Using social media data for assessing children's exposure to violence during the COVID-19 pandemic. Child abuse & neglect, 116, 104747. https://doi.org/10.1016/j.chiabu.2020.104747

10/6: Validity, confounds, and sources of error

- Jhangiani, Ch. 4
- van Holm, Ch. 5, Ch. 19 (excluding the Practice section)
- Nardone, A., Rudolph, K. E., Morello-Frosch, R., & Casey, J. A. (2021). Redlines and greenspace: the relationship between historical redlining and 2010 greenspace across the United States. *Environmental health perspectives*, *129*(1), 017006. https://doi.org/10.1289/EHP7495

10/13: Interventions

- Jhangiani, Ch. 8
- van Holm, Ch. 7

- Avram, R., Koepcke, E. J., Moussawi, A., & Nuñez, M. (2024). Do Cure Violence Programs Reduce Gun Violence? Evidence from New York City. https://doi.org/10.48550/arXiv.2406.02459

10/20: Causal processes

- Jhangiani, Ch. 12.52, Ch. 12.53
- van Holm, Ch. 10, Ch. 13 (excluding the Practice sections)
- 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

10/27: Individual differences

- Jhangiani, Ch. 9, Ch. 13.60
- van Holm, Ch. 14, Ch. 15 (excluding the Practice sections)
- 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

11/3: FALL BREAK

- van Holm, Ch. 11

11/10: Narrative identity and change

- van Holm, Ch. 6
- Harding, D. J., Dobson, C. C., Wyse, J. J., B., & Morenoff, J. D. (2017). Narrative change, narrative stability, and structural constraint: The case of prisoner reentry narratives. *American Journal of Cultural Sociology, 5*(1-2), 261-304. https://doi.org/10.1057/s41290-016-0004-8
- Azad, A., & Carlsson, J. (2024). Identity status and narrative identity processes in female adolescents' stories about committing crimes and being convicted. Journal of Adolescence, 96(1), 124-135. https://doi.org/10.1002/jad.12261

11/17: Science communication

- TBD

11/24: Bias in data and algorithms

- Cathy O'Neil, *Weapons of Math Destruction* (2016). Intro, Ch. 5, Ch. 10.
    - You can access this book for free via CLIO
- Gebru, T. (2020). Race and gender. The Oxford handbook of ethics of AI, 4, 253. https://doi.org/10.1093/oxfordhb/9780190067397.013.16