Social Research Methods
(Alternate Title: Replication and Reproducibility in Social Science)
SOC/CRM 500 – 001
TH 5:30 – 8:15pm in Bear Hall, Rm. 219
Fall, 2021

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Course Introduction

This course aims to improve your ability to review, evaluate, and apply social science research methods and, relatedly, to critically assess "what we know" in specific research areas. In doing so, we will discuss challenges encountered when attempting to produce trustworthy and reliable empirical findings and identify some strategies for overcoming such challenges.

Though many of the methodological issues raised in this course have been identified and debated for as long as people have engaged in social science, these issues have garnered increasing attention over the last decade alongside the emergence of the well-documented "replication crisis" in (social) science. There seems to be a growing recognition (among some) that many of the issues identified as causes of the "replication crisis" in other disciplines also are present – and perhaps even highly prevalent – in the day-to-day practice of scientific sociology, criminology, and criminal justice. Yet, as disciplines, sociology, criminology, and criminal justice have been relatively slow in adopting reforms meant to increase veracity, reliability, and trust in our empirical findings.

I jointly designed this course in collaboration with Dr. Jonathan R. Brauer (Indiana University), a former graduate student colleague, current collaborator, and long-time friend. Together, our aim was to develop the course that we wish we would have had as our first-year methods course in graduate school. We expect that developing an appreciation for and the technical skills necessary to practice open and reproducible science will become increasingly valued in professional social science both within and outside academia. Hence, we would rather you start your careers with these skills as opposed to retooling later in your professional careers like we are doing. We also think you are better off with a realistic and critical view of the methodological challenges that are perhaps endemic to social scientific fields. You cannot start to imagine changing typical practices and/or addressing these challenges until you have a clear picture of what you are facing.

Of course, you should *not* expect to come out of this course knowing everything you need to know to write a thesis or dissertation and to carry out your own reproducible and trustworthy independent research. At minimum, my hope is that through this course you develop an appreciation for the scientific enterprise, the importance of research design, and the current debates and reforms related to practicing open and reproducible social science. I hope you will also come to see that learning how to collect and analyze data is just that – an ongoing process of *learning*. Likewise, as a professional social scientist, I hope you leave this course prepared to continue the difficult but rewarding investment in this learning process throughout your graduate training and throughout the rest of your professional career.

Course goals and objectives

My primary goal in this course is to guide and evaluate your pursuit of the following objectives:

- *Understand meaning, causes, and possible solutions to the so-called "replication crisis"*
- *Relatedly, identify various challenges encountered when attempting to produce trustworthy and reliable empirical findings in social science research, as well as identify potential solutions to these challenges*
- *Understand how different philosophies of science shape approaches to research methods*
- *Develop a capacity to review, evaluate, and apply social science research methods and to critically assess "what we know"*
- *Develop an appreciation for, and practice, some of the technical skills necessary to conduct one's own open, reproducible, and trustworthy social science research*

In order to accomplish these primary goals, you will be expected to do the following:

- *Read assigned materials, then summarize, react, and ask questions about the readings*
- *Demonstrate engagement with and comprehension of course materials by being prepared for and participating in class discussions in an intelligent and informed way*
- *Complete assignments intended to provide a basic introduction in how to conduct reproducible social science research using R and RStudio*
- *Reproduce descriptive statistics from an existing research study following reproducibility principles using R, and conduct a peer review of a classmate's reproducibility project.*

Required Text

Ritchie, Stuart. 2020. *Science Fictions*. New York: Metropolitan Books.

Chalmers, Alan. 2013. *What is This Thing Called Science.* Queensland, Australia: University of Queensland Press.

*Additional readings will be made available on the course's Canvas site

Optional Text

There are numerous Sociological & Criminological textbooks on social research methods. In the past, I have relied on Singleton and Straits' (2010) and Carr et al.'s (2018) textbooks (see references below). These books provide a good overview of social research design and the many decisions that researchers make when systematically observing the social world. But there are numerous other social research methods textbooks and they all cover the same basic material, although in slightly different fashions. If you think such a textbook would be useful, I recommend purchasing a used copy or borrowing one of these books. There are also numerous online research methods resources, including textbooks, that you can access through UNCW's library or that are freely available online (see the course canvas page for more details).

Carr, Deborah, Boyle, Elizabeth Heger, Cornwell, Benjamin, Correll, Shelley, Crosnoe, Robert, Freese, Jeremy, and Waters, Mary C. 2018. *The Art and Science of Social Research*. New York: W. W. Norton & Company.

Singleton, Royce A. and Straits, Bruce C. 2010. *Approaches to Social Research*. Fifth Edition. Oxford, New York: Oxford University Press.

Course Requirements
Although obtaining a good grade in the class should ***not*** be your main goal (your goal should be to prepare yourself for professional work, which really has little connection with your grades in graduate school), your performance on the following activities and assignments will contribute to my overall evaluation of your performance in the following proportions:

1) **Course Participation & Contribution (10%)**

   Each student will be expected to read and study carefully all the assigned material prior to the class meeting in which it is to be discussed, and to participate effectively in the class discussion. It is acceptable to be wrong, to misinterpret, to challenge/disagree, or simply to misunderstand. It is not acceptable to be unprepared.

2) **Reading Assignments (20%)**

   Each week you have assigned readings (marked with asterisk on schedule), you are required to submit a "Reading Assignments" document with the following sections:

   - Reading Summary – Summarize the weekly readings in a few sentences.
   - Reading Reaction – Describe reactions you had to weekly readings in a few sentences.
   - Discussion Questions – Write two (2) discussion questions based on weekly readings each week. At least one of these should be a "synthesis" question that covers shared ideas across multiple readings. The other question can be specific to a particular reading.

   Reading Assignments should be submitted by **Thursday at 2pm** via Canvas. In addition to assessing whether Reading Assignments were turned in on time, I will evaluate these summaries, reactions, and questions for diligence, thoughtfulness, pertinence to the weekly topic of discussion, and efforts at comprehension displayed. There are 12 weeks with reading assignments due. For attendance flexibility purposes, I will drop one weekly grade and count only 11 reading assignments.

   Any additional assignments not listed on the syllabus will count toward this portion of your grade.

3) **R Assignments (30%)**

   These four assignments are intended to provide you with a basic introduction to conducting reproducible data science using R and RStudio. Each is listed as an "R Assignment" (1 through 4) on the course schedule below. See Canvas for details. After completing these assignments, you should have a firm foundation for reproducing results from a table or figure containing simple descriptive statistics (see "Reproducibility Project" below).

   - R Assignment 1 (40 pts): *Introduction to R & RStudio*
   - R Assignment 2 (60 pts): *Introduction to RMarkdown*
   - R Assignment 3 (100 pts): *Downloading Data & Reproducing Figure*
   - R Assignment 4 (100 pts): *Conceptual Replication; Visualization; Images: Reproducible Files*

5) **Reproducibility Project (30%)**
There are four parts to this *Reproducibility Project*, listed as a "Project Assignment" (1–5) on the course schedule below. See Canvas for details. To complete this project in its entirety, you will likely need to combine what you learned in the "R Assignments" (above) with additional self-directed learning via online searches for additional R vignettes; this is a normal part of data science – in fact, it something that I do on an almost daily basis.

- Project Assignment 1 (50pts): *Find Article with Data Available Online to Reproduce*
- Project Assignment 2 (75pts): *Describe & Justify Reproduction, Share Image of Original Study's Table/Figure using R; Read Data into R; Summarize Raw Variables*
- Project Assignment 3 (75pts): *Submit First Draft of Reproduction for Peer Review*
- Project Assignment 4 (100pts): *Final Reproducibility Project*

6) **Peer Review Assignment (10%)**
In addition to conducting your own reproducibility project, each of you will also conduct a "peer review" of one classmate's reproducibility project.

Immediately following submission of the first draft of your project, I will send the link your submitted project's shared drive folder to ONE of your classmates to review. I will loosely follow a "single-blind" review format. That is, the reviewer will know the author, but I will not formally identify the reviewer's name to the author. Of course, in small classes, reviewer anonymity cannot be guaranteed.

NOTE: You must submit the first draft of your project on time (i.e., by **5pm on Thursday, 11/4**) to participate and earn points in this required peer review. Failure to submit the term paper in on time may result in a "0" on this assignment.

Peer reviewers are responsible for providing detailed and constructive feedback (i.e., not just "good job!" – there are always ways we can improve our work) using a helpful and professional tone. In conducting your peer review, think about the steps you have taken so far and assess the things you have learned. E.g.,

- *Description/Justification*: Does the author describe and justify the reproduction project aims clearly and effectively? Is the original study included in one of the project folders? Can I find the table or figure in the original study that the author is attempting to reproduce? Is the original study and that specific table/figure described clearly and accurately?
- *Project File Structure:* Is the RMarkdown file in the "root" folder of the shared drive? Are there separate and clearly marked folders following best practices (e.g., Data; Articles; Images)? Can I open the RMarkdown file?
- *R Code Reproducibility:* After installing any necessary packages, can I successfully run all R Code chunks, or does running the code generate errors? If errors generated, is it immediately obvious what those errors are, and can I fix them with minimal effort to continue the review of R Code chunks? Is there anything I can suggest to the author for improving their R Code chunks (e.g., error fixes; efficiency improvements; reproducibility improvements; useful additions)?

Grade Scale

A : 93-100%	B+ : 87-89%	C+ : 77-79%
A- : 90-92%	B : 80-86%	C : 70-76%
		F : < 70%

Classroom Environment & Format
This course is meant to be a seminar. I would prefer to moderate an active discussion regarding key issues surrounding research design rather than lecture about these topics. This style of learning is the convention in graduate school and can be both intellectually challenging and rewarding. However, you should recognize that in a seminar, everyone is both a student and a teacher and we all share the responsibility for creating a successful learning environment. This includes being on time, prepared for class and participating in classroom discussion and activities.

I expect that discussions will be professional and polite but engaged. Do not shy away from making points, asking pointed questions, or pushing arguments about the topic(s) of the day. I will try to push you on your arguments and ideas, and I trust that you will do the same for me and each other.

Technical Issues
Technical and logistical problems, such as being unable to access a computer, computer failure, problems with internet connections (such as speed or quality of the connection) or browser, failure to check that your assignments have properly uploaded, etc., will not automatically result in remedies favorable to students. Even if the technical or logistical problem is not your fault, you are not guaranteed a retake or "do-over" for the assignment. Any such issues are dealt with on a case-by-case basis. Further, to avoid last minute problems, it is highly recommended that you complete readings, videos, and assignments as early as possible during each module.

Students with Disabilities
UNCW is open and accessible to students with disabilities and is committed to providing assistance to enable qualified students to accomplish their educational goals, as well as assuring equal opportunity to derive all of the benefits of campus life. If you are a person with a disability and anticipate needing accommodations of any type in order to participate in this class, you must notify the Disability Resource Center (#1033 DePaolo Hall, 910-962–7555), provide necessary documentation of the disability and arrange for the appropriate authorized accommodations. Once these accommodations are approved, please identify yourself to me so we can implement these accommodations.

Harassment
The role of all employees and students is to create and maintain a supportive and harassment--free working and learning environment for all members of the campus community. All faculty, staff and students are responsible for understanding and complying with harassment policies. These policies can be viewed at: http://uncw.edu/policies/documents/02.200_Unlawful_Harassment.050605.pdf.

Title IX Mandatory Reporting Policy
UNCW takes all forms of sexual harassment and sexual misconduct very seriously. When students disclose, first or third-hand, to faculty or staff about sexual harassment or misconduct, this information must be reported to the administration for follow-up. The purpose of this is to insure that students' rights are insured, appropriate resources are offered, and further investigation is explored. Three offices are confidential, and thus do not need to make this report: UNCW CARE, the Student Health Center, and the Counseling Center. If you want to speak to someone in confidence, these resources are available, including CARE's 24-hour crisis line (910-512-4821). For more information, please visit www.uncw.edu/sexualmisconduct or www.uncw.edu/care.

Academic Integrity
Academic integrity is an important issue in higher education and will be treated as such in this class. Graduate students are expected to be familiar with the basic standards of citing others' work, giving credit for others' ideas, and avoiding plagiarism. As an enrolled student, you are agreeing to abide by UNCW's Student Academic Honor Code (http://www.uncw.edu/odos/honorcode/).

Students should also be familiar with the department's emphasis on "self-plagiarism" (see here: https://uncw.edu/socgrad/includes/mahandbook.pdf). However, I would encourage students to not be stifled by our department's emphasis on "self-plagiarism." Your goal should be to continually improve on the quality, clarity, and rigor of your work and your ideas, both while you are in our program and as you develop in your professional careers. This often requires that you focus on the same or similar topic(s) across courses and semesters. I simply expect you to be able to clearly articulate how your work in this course is distinct from your work in prior and/or concurrent courses. If you ever have concerns regarding these issues, please talk to me and your other professors about them.

Campus Student Learning Resources

The University Learning Center (www.uncw.edu/ulc), DePaolo Hall 1056 & 1003
The University Learning Center's (ULC) mission is to help students become successful, independent learners. Tutoring at the ULC is NOT remediation: the ULC offers a different type of learning opportunity for those students who want to increase the quality of their education. ULC services are free to all UNCW students and include the following:

- Learning Services (University Studies) http://www.uncw.edu/ulc/learning/index.html
- Math Services http://www.uncw.edu/ulc/math/index.html
- Study Sessions http://www.uncw.edu/ulc/includes/StudySessions.html
- Supplemental Instruction http://www.uncw.edu/ulc/si/index.html
- Writing Services http://www.uncw.edu/ulc/writing/index.html

Randall Library (http://library.uncw.edu)
The Randall Library has a host of online and in-person tools and services to assist students throughout their time at UNCW. This includes research services that are relevant to your work in CRM/SOC 255 (http://library.uncw.edu/get_started).

Tentative Course Schedule

** indicates reading assignment is due by Thursday at 2pm.*

8/19 1. Introduction

Get acquainted; Explain course logic, schedule, & assignments

8/26 2: Science: A Candle in the Dark *

Sagan (1995)	*Demon-Haunted World, Ch.1: The Most Precious Thing*
Ritchie (p.1-23)	*Chapter 1: How Science Works*
Chalmers (p.*xix*-17)	*Intro. & Chapter 1: Science, Observation, & Facts*
Optional readings:	
Pacheco-Vega:	Preparing for reading-intensive seminar & AIC method
R Assignment 1	***Introduction to R & RStudio***

9/2 3: Science: A Candle, or a House of Cards? *

Ritchie (p.25-43):	*Chapter 2: The Replication Crisis*
Chalmers (p.18-37)	*Chapters 2 & 3: Observation & Experiment as Intervention*
Bem (2011)	*Feeling the Future*
Open Science Collab. (2015)	*Estimating the Reproducibility of Psychological Science*
R Assignment 2	***Introduction to RMarkdown***

9/9 4: Social Norms & Deviance in Science *

Ritchie (p.48-80):	*Chapter 3: Fraud*
Merton (1942)	*Chapter 13: Normative Structure of Science*
Bartlett (2019)	*Stewart Retractions*
Pickett (2020)	*Stewart Retractions*
Neyfakh (2015)	*Alice Goffman & Ethnics of Ethnography*
Optional readings:	
Janz & Freese 2021	*Replication Golden Rule*
Project Assignment 1	***Find Article with Data Available Online to Reproduce***

9/16 5: Is Scientific "Knowledge" Full of Bias? *

Ritchie (p.81-122):	*Chapter 4: Bias*
Chalmers (p.38-54)	*Chapter 4: Induction*
Roscigno & Preito-Hodge (2021)	*Racist Cops*
Peyton (2021)	*Racist Cops*
Hu (2021)	*Race, Policing, & Limits of Social Science*

9/23 6: Negligence & "Falsification" in Social Science *

Ritchie (p.123-144):	*Chapter 5: Negligence*
Chalmers (p.55-68)	*Chapter 5: Intro. to Falsificationism*
Knox & Mummolo (2020)	*Race & Officer-Involved Shootings*
Johnson et al. (2020)	*PNAS Article Retraction*
Massey & Waters (2020)	*PNAS Article Retraction*
Optional readings:	
Long (2020)	*Workflow for Reproducible Results*
R Assignment 3	***Downloading Data & Reproducing Figure***

9/30 7: Hype and Perverse Incentives Spoil Science *

Ritchie (p.145-199):	*Chapters 6 & 7: Hype & Perverse Incentives*
Chalmers (p69-96)	*Chapters 6 & 7: Sophisticated Falsificationism & Limits of Falsificationism*
Singal (2020)	*Quick Fix Psychology*
Tiokhin (2020)	*Honest Signaling in Academic Publishing*
Optional readings (Hype):	
Miller et al. (2020)	*Police & Bias Training*
Kaste (2020)	*Police & Bias Training*
Optional readings (Perverse Incentives):	
Gartner et al. (2012)	*Salami Slicing*
Cullen et al. (2013)	*Salami Slicing*
Cohen (2012)	*Overly Similar Publications*
Smaldino & McElreath (2016)	*Natural Selection of Bad Science*
Else (2021)	*Fabricated Publications*
Simonsohn (2015)	*Reducing Fraud in Science (Data Colada)*
Long (2020)	*Workflow for Reproducible Results*
Optional readings (General):	
Kastellec & Leoni (2007)	*Graphs Not Tables*

10/7 No Class – Fall Break

10/14 8: Questionable Research Practices (QRPs) & Open Science Practices (OSPs) *

Ritchie (p.199-237):	*Chapter 8: Fixing Science*
Chalmers (p.97-119)	*Chapter 8: Kuhn's Paradigms*
Chin et al. (2021)	*QRPs & OSPs in Criminology*
Schimmack & von Hippel (2021)	*Testing the "Replicability Index," Part 1 & Part 2*
Wooditch et al. (2018)	*Outcome Reporting Bias*
Optional readings:	
Sweeten (2020)	*Standard Errors in Quantitative Criminology*
Chang & Li (2017)	*Failures to Reproduce with Author's Code & Help*
Perkel (2020)	*Does Your Ten-Year-Old Code Still Run?*
Simonsohn (2021)	*Version control in R with Groundhog*
R Assignment 4	***Conceptual Replication; Visualization; Images; Reproducible Files***

10/21 9: Garden of Forking Paths *

Ritchie (p.239-254):	*Eplogue & Reading a Scientific Paper*
Chalmers (p.121-137)	*Chapter 9: Lakatos*
Gelman & Loken (2013)	*Garden of Forking Paths*
Rohrer et al. (2021)	*Loss of Confidence Project*
Siberzahn & Uhlmann (2015)	*Many Analysts, One Data Set*
Optional readings:	
Ioannidis (2005)	*Why Most Published Research is False*
Simons et al. (2011)	*Researcher Degrees of Freedom*
Project Assignment 2	***Describe/Justify Reproduction, Read Data, Summarize Vars***

10/28 10: Wait, Is There a Theory Crisis Too? *

Chalmers (p.138-147)	*Chapter 10: Feyerabend*
Eronen & Bringmann (2021)	*Theory Crisis in Psychology*
Fried (2021)	*On Theory*
Dooley & Goodison (2020)	*Rejecting Theory in US Criminology*
Farrall & Sparks (2020)	*Response to Rejecting Theory in US Criminology*
Optional readings:	
Meehl (1967)	*Theory Testing in Psychology & Physics*
Fried (2021)	*Theories and Models*
Robinaugh et al. (2021)	*Formal Theory*

11/4 11: Messy Measurement & Unclear Causality *

Chalmers (p.149-160)	*Chapter 11: Against a Universal Method*
Rohrer (2018)	*Graphical Causal Models*
Flake & Fried (2020)	*Questionable Measurement Practices*
Lundberg et al. 2021	*What is Your Estimand?*
Auspurg & Brüderl (2021)	*Many Analysts, One Data Set Revisited*
De Menard (2020)	*What's Wrong with Social Science*
Optional readings:	
Gordon et al. (2020)	*Replication Rates by Field*
Robinaugh et al. (2021)	*Formal Theory*
Project Assignment 3	***Submit Reproduction for Peer Review***

11/11 12: Better Science with Bayes? *

Chalmers (p.161-177)	*Chapter 12: Bayesian Approach*
Gelman & Weakliem (2009)	*Of Beauty, Sex, & Power*
Brauer et al. (2019)	*Improving Inferences from Underpowered Designs*
Wasserstein & Lazar (2016)	*ASA Statement on p-Values*
Greenland et al. (2016)	*Guide to p-Value Misinterpretations*
Optional readings:	
Kruschke & Liddell (2018)	*Bayesian Data Analysis for Newcomers*
Lakens (2021)	*Correctly Used p-Value*
Lakens (2021)	*Sample Size Justification*
Barnes et al. (2020)	*Statistical Power in Criminology*
"New Statistics" ESCI	*Visualizations*

11/18 **13: Preregister Your Risky Predictions ***

(Note: ASC Annual Meeting – class likely to meet via zoom)

Chalmers (p.179-196)	*Chapter 13: New Experimentalism*
Gelman et al. (2019)	Review #2 (Haig) from *Many Perspectives on Mayo's SIST*
Navarro (2020)	*Paths in Strange Spaces*
Scheel et al. (2021)	*Should We Spend Less Time Testing Hypotheses?*
Murphy et al. (2021)	*Ethnography & Data Transparency in Information Age*
Optional readings:	
Chatard et al. (2020)	*Failing to Follow Preregistration*
Lakens (2018)	*Strong vs. Weak Hypothesis Tests*
Lakens (2019)	*Preregistration & Error Control*
Szollosi et al. (2019)	*Is Preregistration Worthwhile?*
Aquinis & Solarino (2019)	Transparency & Replicability in Qualitative Research
Pratt et al. (2020)	Decoupling Transparency from Replication in Qual. Research
Additional resources:	*Transparency & OSP in Qualitative Research*
Peer Review Assignment	***Submit Peer Review of Classmate's Reproduction***

11/25 **No Class – Thanksgiving Break**

12/2 **No Class – Reading Day**

Optional Assignment/Activity	*Translating Causal Claims into Graphical Causal Models*

12/9 **Finals Week**

Project Assignment 4	***Final Reproducibility Project Due***