MAS.S73: Moving Beyond The Replication Crisis: How to Spot Misleading Social Science and Design Better Experiments

Course Information
3 credit hours P/D/F; listeners accepted

Tuesday/Thursday 4-6 PM EST
1/11, 1/13, 1/20, 1/25, and 1/27
Location: E15-359

Instructor Information

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https://replication.media.mit.edu

Course Description

The replication and generalizability crisis in social psychology has dramatic implications for designers and engineers. Poor research methodology has damaged our understanding of the relationship between human behavior or experience with intervention design; moreover, the statistical mistakes that underlie the crisis continue to threaten modern HCI research. Luckily, there are many useful resources available to help us navigate and understand the existing literature and prevent our work from falling into similar empirical traps.

In this class we will separate useful, empirically grounded psychology from common misconceptions; we will give review conceptual details of the most common statistical analyses, alongside basic meta-statistics so we can identify and avoid bias in the literature as well as in our own research; and we'll look at future directions that integrate strong psychological science with empirical design.

This class has no prerequisites and is tailored towards an intelligent beginner, but we expect even advanced practitioners to find something useful and enjoyable in the material. We hope that the class can serve as a gathering place for those interested in cross-disciplinary work with a psychological basis.

Prerequisites/Corequisites

Intended Learning Outcomes

By the end of this course, students will be able to…

- Identify and avoid common popular misconceptions from social psychology, and learn how to evaluate and apply them to design and HCI correctly
- Articulate a correct and nuanced understanding of the influence of external factors on human behavior and experience
- Conceptually explain common statistical techniques, including how they can be misapplied
- Improve the empirical validity of their own research and report statistics correctly
- Critically evaluate existing psychology research literature using rules of thumb and available meta-statistical analyses
- Statistically evaluate existing psychology research using basic bias detection methods, and understand general meta-statistical approaches they apply to existing research
- Design improved psychological and psychometric research methods at the intersection of psychology and HCI
- Network and engage with a community of like-minded researchers in the broader MIT community

Course Materials
- https://replication.media.mit.edu

What to expect in this course
- There will be 6 lecture/discussion sections in the course over IAP 2022

  - Intro and Overview of the Replication Crisis
  - Philosophical Groundwork: Induction and Causal Reasoning
  - An Overview of Failed Replications and Practical Insights for Design
  - Conceptual Stats 101 (Effect Sizes, Power, P-values, what it really means)
  - How to Read and Write Papers: Bias Detection, Blogs, and Better Methods
  - Systemic Issues in Psychology and the Future

- We expect students to actively engage with each section, which will include a 1.5 hour lecture and discussion. There are several co-teachers of this class; we expect each class to have a main presentation by a designated lecturer, but we expect spirited and engaging discussions after each lecture. We will treat this as a co-learning environment.

- For-credit students will also be expected to post a blog entry to the course website detailing their 'bias detection' meta-statistical review of a topic from the literature. This will include a survey of several papers on the same general topic, to be agreed upon with the teaching team. The statistical techniques are relatively simple, and will be taught in class. We expect this exercise to take 8-16 hours to complete thoroughly.

Assessments
- Assessment will be based on the following two criteria:
  - Participation (showing up, active engagement with the teaching staff) = 60% (10% per class)
  - Final Assignment = 40%
    - The final assignment will be assessed across three major criteria:
      - 20% for the quality of your empirical work. A rigorous look at several papers in a topic area and correct application of the meta-statistical techniques.
      - 10% for novel, clear, and thorough synthesis of the existing literature.
      - 10% for readability and audience fit. We want your blog post to be engaging and approachable for novice, lay readers. We recommend a final editing and review session with the WCC, which will automatically give you full credit on this 10%- watching someone read your blog post in front of you can be a sobering and powerful learning experience.

Course Expectations and Policies
We expect full attendance and active listening in each class, without cell phones or laptops out. You do not have to be vocal in group discussion to get full participation; however, we expect some proof of active engagement with the course material-- being vocal in group discussion is one way, chatting with a teacher one-on-one about a topic of interest is another, emailing a follow up question is yet another. We need to know that you've synthesized what you have learned.

There is one assignment, which we expect to be handed in on time. Late days incur compounding penalties of 2.5*n% per additional day (day 1=2.5%, 2=7.5%, 3=15%, 4=25%, etc.) We want to have the assignment graded and completed before the spring semester. Obviously, we will be very accommodating if you have a real need for an extension, just come speak with us; however, because of the short duration of the course and the single assignment, we do expect timely and full completion to warrant credit.

Inclusivity Statement

MIT values an inclusive environment. We hope to foster a sense of community in this classroom and consider this classroom to be a place where you will be treated with respect. We welcome individuals of all backgrounds, beliefs, ethnicities, national origins, gender identities, sexual orientations, religious and political affiliations – and other visible and nonvisible differences. All members of this class are expected to contribute to a respectful, welcoming, and inclusive environment for every other member of the class. If this standard is not being upheld, please feel free to speak with us.

Academic integrity statement

In this course, We will hold you to the high standard of academic integrity expected of all students at the Institute. We do this for two reasons. First, it is essential to the learning process that you are the one doing the work. We have structured the assignments in this course to enable you to gain a mastery of the course material. Failing to do the work yourself will result in a lesser understanding of the content, and therefore a less meaningful education for you. Second, it is important that there be a level playing field for all students in this course and at the Institute so that the rigor and integrity of the Institute's educational program is maintained.

Violating the Academic Integrity policy in any way (e.g., plagiarism, unauthorized collaboration, cheating, etc.) will result in official Institute sanction. Possible sanctions include receiving a failing grade on the assignment or exam, being assigned a failing grade in the course, having a formal notation of disciplinary action placed on your MIT record, suspension from the Institute, and expulsion from the Institute for very serious cases.

Please review the Academic Integrity policy and related resources (e.g., working under pressure; how to paraphrase, summarize, and quote; etc.) and contact me if you have any questions about appropriate citation methods, the degree of collaboration that is permitted, or anything else related to the Academic Integrity of this course.[1]

Special Accommodations and Disability Support Services

If you need disability-related accommodations, I encourage you to meet with us or let us know early in the semester. If you have not yet been approved for accommodations, please contact Student Disability Services at sds-all@mit.edu.

We look forward to working with you to assist you with your approved accommodations.

Mental Health

As a student, you may experience a range of challenges that can interfere with learning, such as strained relationships, increased anxiety, substance use, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may impact your ability to attend class, concentrate, complete work, take an exam, or participate in daily activities.

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[1] Office of Student Citizenship, W20-507, (617) 258-8423

Undergraduates: Please discuss this with Student Support Services (S3). You may consult with Student Support Services in 5-104 or at 617-253-4861.

Graduate Students: Please reach out to the deans for personal support in the Office of Graduate Education.

For urgent or after-hours concerns, please contact MIT Police.