PSYCH-UA 11: Statistics and Data Analysis for Research in Psychology

Spring 2024 Monday / Wednesday 12:30 pm – 1:45 pm
Silver Center (31 Washington Place), Room 411

Who you'll be working with

Dr. Kelsey Moty (Pronouns: she/her)
You can contact me at: moty@nyu.edu
You can find me at: Meyer 401 (or on Zoomland)
My office hours are: Wednesdays 11 am – 12 pm, in-person (or by appointment, on Zoom)
Appointments can be scheduled at: https://calendly.com/kelseymoty/office-hours

Class Assistant:
Henriette Van Marcke
hv2101@nyu.edu

What you should expect to learn (briefly)

Statistical fluency is becoming increasingly important in our data-driven world. Being comfortable, knowledgeable, and skilled in dealing with data can provide a notable benefit in everyday life. The main goal of this course is to provide a functional understanding of data, statistics, and the means of making sense of the former (data) by using the latter (statistics).

Prerequisites for this course:

No prerequisites.

As of Fall 2023, students have now a variety of options to fulfill their statistics requirement:
- Statistics for Behav. Sci. (PSYCH-UA 10) and this course (PSYCH-UA 11), in any order.
- This course (PSYCH-UA 11) and Data Literacy (PSYCH-UA 8), in any order.
- This course (PSYCH-UA 11) and a quantitative advanced elective, in any order.
- Statistics for Behav. Sci. (PSYCH-UA 10) and Data Literacy (PSYCH-UA 8), in any order.
- Statistics for Behav. Sci. (PSYCH-UA 10) and a quantitative advanced elective, in any order.

Note that students can now fulfill their requirements without PSYCH-UA 11 (e.g., see the last 2 options).

Some important information you should read:

1) This course (kind of) uses a textbook.

I list readings that can provide other ways of thinking about the material discussed in class. All of these readings are accessible for free.

- *Explaining Psychological Statistics, 4th Edition, by Barry Cohen*
  This textbook is freely available through NYU. [Click this link](#) > then click "Download Book". You'll need to create a quick ProQuest account (name/email/pw) and download Adobe Digital Editions, which are both free.
- *R for Data Science by Hadley Wickham*.
  It's free! It's [online](#)! It will teach you R! Good if you want to learn how to code or are interested in data science.
- *Learning Statistics with R by Danielle Navarro*
  Also free and [online](#)! They will teach you R and JASP! Extra points for the engaging way in which Danielle Navarro writes.

2) Attendance at lecture in-person is *highly recommended*.

The best learning environment for you and your classmates is when everyone attends via the same medium because the demands of an in-person versus a remote class are quite different. This class is designed for in-person learning, meaning your learning experience will likely be the best if you attend in-person.

If for some reason you cannot attend class in-person (e.g., an illness), lectures will be recorded. But I cannot emphasize enough that the class is more engaging if you can attend live and in-person. Additionally, classes build cumulatively off each other, and missing classes consistently will make it harder to catch up later.

3) Attendance at recitation is *required*.

Recitation provides an additional opportunity to discuss and engage with the material in class. It also provides opportunities to practice using R while in an environment where you can ask an instructor questions.

That being said, life happens. Sometimes it just isn't feasible to make it to class because of illness, etc. I get that. To accommodate this, you can miss 2 recitations without any penalty, no questions asked.

4) Please, please, please ask questions.

Lectures are more interesting (for both you and me!) if I am not talking the entire time. You might think the answer is obvious to others, but there's a good chance that at least several other students in the class have the same question.

I also welcome your opinions and observations and look forward to your contributions to lectures and discussions.

What you will do in this course:

1) Exams (40%)
There will be four exams in this course: three during the semester and one final exam. Exams will consist of a mix of multiple-choice questions. Exams will be in-class and timed (75 minutes). You can bring a single 8.5 x 11" sheet of notes. ***Your lowest exam score will be dropped, so each exam is worth roughly 13.34% of your final grade.***

2) Structured Labs (5%)
Think of these an opportunity to learn how to do certain types of analyses and data manipulations in R. That is, they are essentially tutorials that will prepare you to complete the data assignments and reports. These will be graded on completion and will generally be done during recitation (but some outside class time may be required).

3) Semi-Structured Data Assignments (20%)
These problem sets will ask you to conduct a specific set of analyses on various datasets. That is, you will have to apply the knowledge you learned in the labs to a new dataset.

4) Unstructured Data Reports (30%)
You will complete two data reports in which you will be provided with a dataset and you will have to determine the appropriate analyses to use on the dataset and write up a short results section.

5) Attendance at Recitation (5%)
Come to recitation and participate, and you'll get marked that week for participating. I get that life happens, so you can miss two recitations without any impact on your grade, no questions asked. You will still be responsible for completing the lab from that day.

Course schedule:

This is our tentative course schedule. Depending on the pace of our class, I reserve the right to make changes. These changes will never make something due earlier than what's listed on the schedule. Updates (if any) will be made to the syllabus and reflected on Brightspace.

Date	Topic	Reading	Assignment	Recitation
Jan 22	Introduction	Cohen Ch 1		Introductions
Jan 24	Data and measurement	Cohen Ch 1 Experimentology - 8 Measurement		Lab 0: Accessing R + RStudio
Jan 29	Data wrangling in R			Lab 1: R basics (functions, packages, importing)
Jan 31	Visualizing data	Cohen Ch 2		
Feb 5	Describing data	Cohen Ch 3		Lab 2: Making plots in R
Feb 7	Concepts in Probability Theory I	Cohen Ch 4	Feb 9: Data Assignment 1	
Feb 12	Concepts in Probability Theory II	Cohen Ch 4		Lab 3: Data transformation 1
Feb 14	Sampling	Cohen Ch 4		
Feb 19	NO CLASS – President's Day			No required recitation: TA office hour during Feb 20 recitation time slot
Feb 21	Point Estimation			
Feb 26	Preregistration + in-class review			Review Session
Feb 28	Exam 1			
Mar 4	Hypothesis testing	Cohen Ch 5		Lab 4: Data transformation 2
Mar 6	Statistical power and effect size	Cohen Ch 8	Mar 8: Data Assignment 2	
Mar 11	Hypothesis testing: t-test	Cohen Ch 6,7		Lab 5: t-tests
Mar 13	Hypothesis testing: ANOVA	Cohen Ch 12, 14		
Mar 18 – Mar 22: NO CLASS – Spring Break				
Mar 25	Multiple comparisons	Cohen Ch 13		Lab 6: ANOVA
Mar 27	Nonparametric tests		Mar 29: Data Assignment 3	
Apr 1	How to write your results up + in-class review			Review Session
Apr 3	Exam 2			
Apr 8	Modeling data: Regression I	Cohen Ch 10		Lab 7: Non-parametric
Apr 10	Modeling data: Regression II	Cohen Ch 17	Apr 12: Unstructured Report #1	

Apr 15	Generalized linear models	Cohen Ch 17		Lab 8: Regression
Apr 17	Model complexity and model comparison			
Apr 22	Multivariate statistics I			Lab 9: Data tidying
Apr 24	Multivariate statistics II		Apr 26: Data Assignment 4	
Apr 29	Meta-analyses			Review Session
May 1	Review + Special topics			
May 6	Exam 3			No required recitation: TA office hour during May 6 recitation time slot
May 13	Final Exam: Monday 12:00PM - 1:50PM 31 Washington Pl (Silver Ctr) Room 411		May 10: Unstructured Report #2	

Technology for this course:

R and RStudio Software

What is R? Think of R as a language just like English or Polish are languages. R allows us to communicate with our computer to manipulate, analyze, and visualize data. In order for you to communicate with your computer using R, you need to download R.

But how does it differ from RStudio? Think of RStudio like Microsoft Word or Google Docs. All of these are mediums that allow us to effectively write in their respective languages. It's much nicer for me to write up this syllabus using Microsoft Word (over say, Notepad) because it has a lot of nice features. Same thing with RStudio. It's an interface for more effectively writing code in R. RStudio is also free to download.

Alternatively, you can make a free RStudio Cloud account to get started with R. Using the cloud version ensures that everything has been properly installed and you'll have no issues when trying to load packages. However, the free version only allows 25 working hours per month. That should be enough to satisfy the needs of this class, but if you intend to use R outside of class (or for another class), you should consider installing R on your own computer.

We will be teaching how to use R in the class. However, if you find that you need extra assistance, Bobst library provides software-specific tutorials as well as statistical consultants who are familiar with R. For more details, see their website.

"But I'm not a programmer!" Don't worry. You won't be tested on programming during timed assessments and this class assumes you are coming in with no knowledge. The

assignments are structured in such a way that those who want more programming experience can get it, and those who don't want it, only need to know the bare fundamentals of running analyses in R.

LMS (Brightspace)
Course information, including assignments and Zoom recordings, will be available through the course web site.

Campuswire
We will be using Campuswire to communicate. You can join our class via this link: https://campuswire.com/p/GB127C6F4

Please post all class-related questions on Campuswire (unless it's a private issue, then please email me or the TA directly). You are able to post your questions anonymously to Campuswire.

Other frequently asked questions:

What is the grading scale for this course? Do you round grades?
Your numerical grade will be rounded to the nearest integer and turned into a letter grade as follows:

93-100 A	90-92 A-	87-89 B+	83-86 B	80-82 B-	
77-79 C+	73-76 C	70-72 C-	67-69 D+	60-66 D	0-59 F

Will you post lecture slides?
Yes! Lecture slides will be posted on Brightspace before (or at the start of) class. I cannot guarantee they will be posted in advance of the start of class.

Will there be a study guide for exams?
Yes, but it will mostly be a list of key words / topics you should know. It's up to you to create a more comprehensive guide on each topic. I also cannot guarantee that the study guide will be exhaustive, but it should cover at least 90% of the relevant material for the exams.

Will there be practice questions for the exams?
Potentially? I can't guarantee it, sorry. It takes a lot of work to write good exam questions.

How should I study for the exam?
Come to lecture, read the textbook, go over your notes, work through the study guide, meet with either me or your TA to go over questions you have, create a study group with your fellow students.

Are the exams cumulative?
No, except for the final. However, topics in statistics build off each other, so you might see questions on later exams that build off topics from earlier in the semester.

Are the exams curved?
I don't write exams with the intention of them being curved, but if it appears the exam was harder than intended, then I might curve the exam by a couple of points.

Do you assign letter grades along a "bell curve"?
No, I don't have a quota where only X% of students can get an A, X% of students can get a B, etc. Your ability to do well in this course is not dependent on others doing poorly.

Do I need to take the final exam?
If you are happy with your score on the first three exams, you do not need to take the final (as your lowest exam score is dropped).

Do I need to email you if I am unable to attend lecture?
No. However, if you anticipate missing multiple class because of extenuating circumstances (e.g., an illness) that will significantly impact your ability to do well in class, please feel free to reach out to discuss how to best handle your situation.

Is there extra credit in this course?
No, but there are opportunities to make up lost points (e.g., lowest exam score dropped).

Can I attend a different recitation than my official recitation time?
Yes, that should generally be fine. Just make sure the TA marks you as attending.

When are assignments due?
Officially, at 11:59 pm at the date listed on the syllabus. On a practical level, before I wake up the next day (that is, 7 am the following day).

Are late assignments accepted?
Yes, but there is a late penalty for each day an assignment is late. Please see below.

Days Late	Penalty
1 day (within 24 hours of original deadline)	10%
2 days	25%
3 days	50%
4 days	75%
5 days	Assignment no longer accepted

If your assignment is less than 7 hours late (i.e., it's turned in before I wake up the next day), no late points will be docked. You do not need to email me or the TA asking for this grace: it will be given to you automatically.

If you anticipate turning in an assignment late (for a reason you feel that you should not be penalized for), please email your TA **before the due date** to discuss your situation. Exceptions may be granted for illnesses, emergencies, and other exceptional circumstances (verification may be required).

Do you offer make-up exams?
There are **no make-up exams** in this course. If you miss an exam due to an emergency, that exam is the one that will be 'dropped'. In the rare circumstance that you miss a second exam, you will be offered a long essay format exam.

In the case of a conflict due to a religious holiday, you may request an alternative exam date; please make these requests within the first two weeks of class.

Some more important policies:

1) Email policy
I will answer emails as soon as possible between the hours of 9 am and 5pm Monday through Friday. Messages outside of these hours will be answered as soon as possible, typically within 24 hours (or not till Monday if over the weekend).

Please post your content-related questions onto Campuswire, so that other students from the class can benefit from the answer. If your question pertains to the content of the course (e.g., you're confused about something from the book or said in lecture), these questions may be better answered in-person (with either me or your TA).

2) For students with disabilities
I encourage students with disabilities, including non-visible disabilities like chronic diseases or learning disabilities, to meet with me early in the semester to discuss accommodations. You should also contact the [Moses Center](#) as soon as possible to verify eligibility for academic accommodations. Accommodation statements should be shared with me as early as possible, but if there is a change to the course structure that would better serve you (and your fellow students), please let me know!

3) Religious observances
Some students may wish to take part in religious observances that occur during this academic term. If you have a religious observance which conflicts with your participation in

the course, please meet with me by the end of the 2nd week of the term to discuss accommodations.

4) Respect for diversity

It is my intent that students from diverse backgrounds and perspectives be well served by the course and that the diversity—in its many forms—that students bring to this class be viewed as a strength. It is my intent to present only materials and activities that are respectful to diversity. As we will discuss throughout the course, the field of developmental science has been—and largely still is—dominated by certain perspectives (those of Western, educated, English-speaking researchers who study primarily Western, White, educated, cisgender children). I hope we can acknowledge these limitations, while still thoughtfully engaging with the foundational material of the field.

5) Don't cheat / plagiarize

No form of academic dishonesty will be tolerated. Suspicions of academic dishonesty during exams or on writing assignments will be reported to and adjudicated by the Associate Dean for Students. If a case of academic dishonesty is confirmed, it will result in a penalty that is at least as severe as receiving a 0 on the assignment or quiz. Academic dishonesty includes all forms of plagiarism. Plagiarism includes (but is not limited to): copying or paraphrasing from someone else's work (another student, an online source, or a journal article), turning in someone else's work as your own, or presenting someone else's ideas (a student, online source, or scholar) as your own.

Most importantly, cheating only really serves to cheat yourself out of a learning opportunity. There are many opportunities to make up for a less-than-ideal grade, so don't let the possibility of a bad grade tempt you to cheat.

We will do our best to make clear the line between academic dishonesty and collaborative learning. But if you have any questions about where this line is, it is your responsibility to ask me or your TA.

5) Update policy

The syllabus may change as necessary during the semester (i.e., there are a couple of topics not thoroughly discussed in the book that I am still looking for appropriate readings for). Reasonable efforts (announcement in class and e-mails) will be made to update students if changes arise. Students are responsible for the current syllabus (if there are no changes) and any updates that might occur.

6) Extra help

If you start to struggle at any time during this course, please let us know as early as possible. We are happy to help but it's a lot easier to do so early on than it is to change

things after the fact. If you come to us at the end of the class, there may be very little we can do.

The [University Learning Center](#) has free peer tutoring, including weekly group sessions in support of statistics. Please see their website for their schedule.