

DATA ANALYSIS

Week 1: Getting Started

welcome!



agenda for today

- general intuitions about statistics
- meet & greet
- course walkthrough





a problem and an ice breaker

- go to the course website
- click on the W1 Activity 1 link
- complete the activity
- come back and in groups of 3-4, discuss:
 - your names, pronouns, class years
 - what did you rank as most healthy?
 - was any item difficult to rank?
- report back your conversations



a problem

- get back into the same groups to discuss:
 - what is the information being presented in this graph?
 - what is main message the graph is trying to communicate?
 - does the graph align with your own rankings?
 - what are some questions a policymaker may have about this graph?



what is this course about?

- an introduction to the statistical procedures commonly used [by psychologists] to describe, analyze, and interpret data
- learning goals
 - describe the *conceptual* principles behind statistical thinking and uncertainty
 - apply a *computational and statistical* toolkit to test specific claims and questions
 - communicate effectively through numbers, graphs, and scientific writing



one statistical framework



course snapshot



course outline



exams

why Sheets?



where does the course live?

- course website:
 - https://teaching-me.github.io/data-analysis/
 - course schedule and policies
 - syllabus, slides, links to Canvas
- canvas
 - announcements
 - ALL submissions & discussions
 - grades
- textbook
 - Gravetter, F. J., & Wallnau, L. B. (2017). *Statistics for the Behavioral Sciences* (10th ed.). Belmont, CA: Thomson Wadsworth.



course website walkthrough

assessment formats

Points

- quizzes

- open book, NOT open person
- on Canvas, 2 attempts, 30 minutes: average score is recorded

- problem sets

- open book, NOT open person
- can choose to opt-in or opt-out at three points
- submissions: Google Docs + Sheets

- exams

- midterms: not cumulative, final: cumulative
- quiz-like in-class component + problem set-like take-home

Component	Points
<u>Weekly quizzes</u>	10
Problem sets	30
Exam: Midterm 1	15
Exam: Midterm 2	15
Exam: Final	20
<u>Class participation</u>	10
Extra credit	5
Total	105

Class participation

We all learn better by actively participating in and outside of class. To encourage you to critically engage with the class content, your participation will be assessed through the following mechanisms:

- In-class activities[2.5]: You will work on several exercises by yourself and with your peers during class. You will submit responses to these exercises via Canvas and your participation will be recorded. You will get full credit if you participate in at least 90% of the class exercises. Beyond that, you will be assigned partial credit based on the number of activities/exercises you miss, i.e., 0.5 point will be deducted for each 10% drop in participation (e.g., if you participate in 80% of the activities, you will earn 2 points, if you attend 70% of the classes, you will earn 1.5 points etc.).
- Videos [2.5]: Each week, there will be videos that will describe how to conduct statistical analyses via Google Sheets. Watching these videos will count towards class participation. If you watch 80% of these videos, you will be awarded the full 2.5 points. Beyond that, you will be assigned partial credit based on the number of videos you watch.
- Practice assessments [5]: Before each exam, practice exams will be made available to you to help with your preparation. Submitting these practice exams and getting at least 50% on them will count towards class participation. Practice exams for midterms are worth 1.5 point each and the practice exam for the final will be worth 2 points.

Extra credit

There will be some opportunities to earn extra credit during the semester. These opportunities are described below:

- <u>Complete class surveys (2 points)</u>: There will be 3 surveys during the semester to gather your reflections and suggestions to improve the course. You will be able to earn 1 point for completing the first survey, and 0.5 for the other two surveys. With the exception of the preclass survey, the two other surveys will be anonymous.
- 2. <u>Win Conceptual Czar (1 point)</u>: To incentivize timely preparation and encourage you to master the class content, you will have the opportunity to submit multiple-choice and/or true/false questions based on the course content covered each week. Submitting questions for 8 of the 11 content weeks will earn you this extra credit point. Additionally, if your question is selected to be on any of the exams, you will earn an additional extra credit point.
- 3. <u>Win Analysis Ace (1 point)</u>: To incentivize timely preparation and encourage you to master data analysis, the two students who score the highest on the *computational* exams throughout the semester will earn 1 extra credit point each.
- 4. <u>Win Memer of the Semester (1 point)</u>: Each week, you will have the opportunity to submit a meme via Canvas, that reflects your experience with the course content of that week. Memes should be *original*, i.e., they should be course-specific and something you have created yourself and not simply found on the internet, although you are allowed to use common images/tropes from popular memes as a starting point. All memes will be gathered and sent to the class anonymously at the end of the semester for a survey, and the student(s) with the average highest score and the best scoring meme will both receive 1 additional point. **Note**: A student can only receive a maximum of 1 point through this mechanism, even if the same student has the highest average score in the context *and* the best scoring meme.

course syllabus: questions

- find a group of 5!
- review the syllabus (5 minutes)
- come back with any questions!

Home Syllabus Schedule Grading Additional Resources



W1: Getting Started on
Statistical Thinking
W2: Summarizing and Fitting
Models to Data
W3: Variability & z-scores
W4: Correlation and
Regression
W5: Loose Ends / Exam 1
W6: Sampling

Syllabus: Data Analysis

Basic Course Information

Course number: PSYC 2520 Semester: Spring 2025 When: Tuesdays & Thursdays, 1.15 PM - 2.40 PM Where: Visual Arts Center (VAC) South Website: You are here! Pre-requisites: Two of:

- PSYC 1101 or Placement in above PSYC 1101
- Either BIOL 1102 or BIOL 1109 or Placement in BIOL 2000 level or PSYC 2510

Who is your instructor?

general weekly format

- prep(are)

- watch videos
- (sometimes) read textbook chapters

- try

- lectures (conceptual content)
- in-class activities (conceptual + computational)
- apply
 - conceptual (quiz)
 - computational (problem set)
 - extra credit opportunities



how to study for this class

- utilize evidence-based effective study strategies:
 - retrieval practice: quiz yourself, ask-a-friend, flash cards
 - elaborative encoding: ask "why" questions, work with data!
 - spaced practice: space out your studying, do not cram!
 - peer instruction: talk with your peers, verbalize knowledge
- but...your attitudes toward effort also matter
 - a <u>"growth mindset"</u>
 - feeling a sense of belonging
 - come prepared to class for engagement
 - minimize distractions
 - plan early for assignments and assessments



the course is designed to support you

- retrieval practice

- class participation via activities
- weekly quizzes on each learning module
- elaborative encoding
 - videos + exercises that force you to learn by doing
- spaced practice
 - later concepts build on early concepts
 - problem sets involve integrating old and new content
 - exams are cumulative
- peer instruction
 - before-after format for in-class exercises
 - weekly LA hours



some peer wisdom (spring 2024)

ask lots of questions!

be comfortable being uncomfortable at first

stay on top of the work - review every week

Ask for help! (from Professor Kumar first and foremost, but also from the LAs and your peers in class)

Give yourself more time than you think for problem sets

something about a textbook (ask someone who attended class!)

be prepared to be confused

Don't think this class will be easy

make sure to watch the videos and go to office hours

it can be overwhelming at times but just know that you can do it and it will all get done

Have confidence, and use your resources!

your class



your words!

deviation

data

math

t-tests

science

percentages

mean

information

numbers

knowledge of statistics



knowledge

I have learned about how to perform basic statistical analyses (descriptive and inferential) I have no formal knowledge of statistics

I know the conceptual basics of descriptive statistics (e.g., calculating means, histograms, etc.)

I know the conceptual basics of inferential statistics (e.g., t-tests, ANOVAs, etc.)

While I've learned about performing basic statistical analyses I definitely need a refresher to feel confident

experience with statistics



stats experience

as much as we did at Research Design in Psych.
I have analyzed multiple datasets independently
I have analyzed one dataset independently
I have never analyzed a dataset independently

feelings

excited and nervous! I am sure I will learn something useful that I will also enjoy :)

A little nervous.

I'm excitied to learn more about how statistics can be applied to psychology, but I am also nervous about having to carry out daunting mathematical calculations. I do think what I learn will be very useful for future psych courses, and also courses in other subjects!

I'm a little intimidated because I know large data sets can be difficult to work with but I'm excited to learn skills that will translate to the workforce! This course and its content makes me a bit nervous, for I do not feel very comfortable with numbers and large amounts of data. However, although I will face some challenges, this course covers information and skills that will be very important for me to master moving forward.

I am excited about this course because I know that what we learn is going to be highly applicable. I am also a bit nervous because I have not taken a math class since high school and have never taken a statistics course.

> I feel like I'll learn something new but am slightly worried about getting things down--I'm hoping I can challenge myself to stick with it and develop a routine to get the most out of this course.

make.

I am anxious and scared a little bit.

Excited, but a bit nervous

since I'm a bit rusty with stats. I've always loved stats though.

I am really excited to learn more

about how we interpret data and

how that affects decisions we

Excited, but a little intimidated. Data Analysis just has a little scary ring to it, but I am confident with the materials that Professor Armstrong helped me learn.

I am excited for this course. I feel it will help to solidify statistical concepts I may currently be shaky on and look forward to being exposed to new concepts/ideas.

nervous because I am not good with numbers. I feel like I will definitely learn useful information that could be applied to anything.

I'm excited to learn more about statistics

I am neutral. I know how important it is and that this knowledge will help me, but it is not as exciting as my other classes.

a weekly breakdown



when you have thoughts and questions

Prof. Kumar's office hours (Kanbar 217):

- Tuesdays & Thursdays, 4.15 PM 5.30 PM
- Fridays, 11 AM 12.45 PM (with some exceptions)

Sydney's office hours (Kanbar 101)

• Mondays: 6-8 pm

Jon's office hours (Kanbar 107)

- Sundays: 8-9 pm
- also: meetings by appointment
- also: anonymous feedback surveys each month



reasons to come to office hours (and whose)

- Prof. Kumar
 - Qs about material / concepts / assignments
 - Qs about course policies/assessments/grades
 - reflections on the classroom experience
- learning assistants
 - Qs about problem sets
 - informal feedback about course pace
 - Qs about Canvas deadlines/due dates
 - tech troubleshooting



pick the email you prefer

subject line: (no subject)

Hello,

I did the assignment for this week, and I am unsure about my grade. I thought I attempted all the questions, but it says I did not attempt two. Would be great if you could look into this!

subject line: PSYC2520: Week 3 quiz issue

Hello Professor,

I'm in your Data Analysis class. I did the Week 3 quiz and I am unsure about my grade. I thought I attempted all the questions, but when I look into Canvas, it says I did not attempt two. I would appreciate if you could look into this.

Thank you, Taylor Swift

email 1

email 2

Email isn't just annoying to Gen Z workers—it's stressing them out

Published Tue, Apr 23 2024-1:26 PM EDT

A majority of people say the volume of work emails they get each day is stressful, according to a recent survey of 2,000 U.S. office workers from Babbel, the language learning platform. But Gen Z workers ages 18 to 24 are the most likely to let those messages pile up.

More than a third, 36%, of Gen Z workers say they have over 1,000 unread emails in their inbox, compared with 18% of office workers overall.

They're also more likely than other age groups to say they've sent an email they regret, with 1 in 5 Gen Z professionals saying they "very often" regret the emails they send.

"From our findings, Gen Z appears to struggle the most with email stress and stacking up a huge quantity of unread emails due to a combination of factors," says Esteban Touma, a linguistics and culture expert at Babbel.

"Gen Z's communication preferences are heavily influenced by the prevalence of instant messaging platforms and social media," he says. Platforms like Snapchat and Instagram, for example, prioritize instantaneous communication, informality and visual cues.

On the other hand, "the structured and formal nature of email communication may feel unfamiliar and more complicated to many [Gen Zers]," Touma says.

story link

a note about emails

- emails (unfortunately) are the default mechanism for professional interaction
- please address the person you are emailing (Prof. Kumar, Jon, Sydney) and use a relevant subject line with the course title/number
- if an email is sent to you or a small group,
 please respond by the end of the day
- if you ask a question and get a response,
 please acknowledge the reply

subject line: PSYC2520: Week 3 quiz issue

Hello Professor,

I'm in your Data Analysis class. I did the Week 3 quiz and I am unsure about my grade. I thought I attempted all the questions, but when I look into Canvas, it says I did not attempt two. I would appreciate if you could look into this.

Thank you, Taylor Swift



valuing our voices

- I will try my very best to create an inclusive environment for all of you
 - we are all different and that is a strength
 - we also exist beyond the classroom!

sheets 101: demonstration



- any <u>dataset</u> typically has rows and columns
 - each row (typically) denotes a single observation / data point
 - each column (typically) denotes the measure being observed
- doing math in Sheets is super easy
 - double click on an empty cell:
 - \circ add two numbers: =2+3
 - subtract two numbers: =2-3
 - multiply two numbers: =2*3
 - \circ divide two numbers: 2/3
 - adding values from existing columns
 - =A2+B2 OR SUM(A2,B2)

quick note on math notation

- Σ : sigma / summation: add everything to the right of Σ
- ΣX = adding all values in column X
- ΣX^2 = squaring all values in column X and then adding them
- $(\Sigma X)^2$ = adding all values in column X and then squaring the sum



next time

- statistical thinking / what are data??

Before/End of Tuesday

- Read the <u>syllabus</u> for this course. If you have questions about the syllabus, then please ask them in class or on the pre-class survey.
- Complete the <u>Pre-class survey</u>!

Before Thursday

- Watch: <u>Introduction to Google Sheets</u>. Leave an annotation to complete participation.
- Read <u>Chapter 1</u> from the Gravetter & Wallnau (2017) textbook.
 Leave an annotation for any questions you have.
- Take the <u>Skills Assessment Exam</u> from the textbook (Appendix A) and submit a reflection. This will help me support you better in the course.

After Thursday

• See the <u>Apply</u> section.