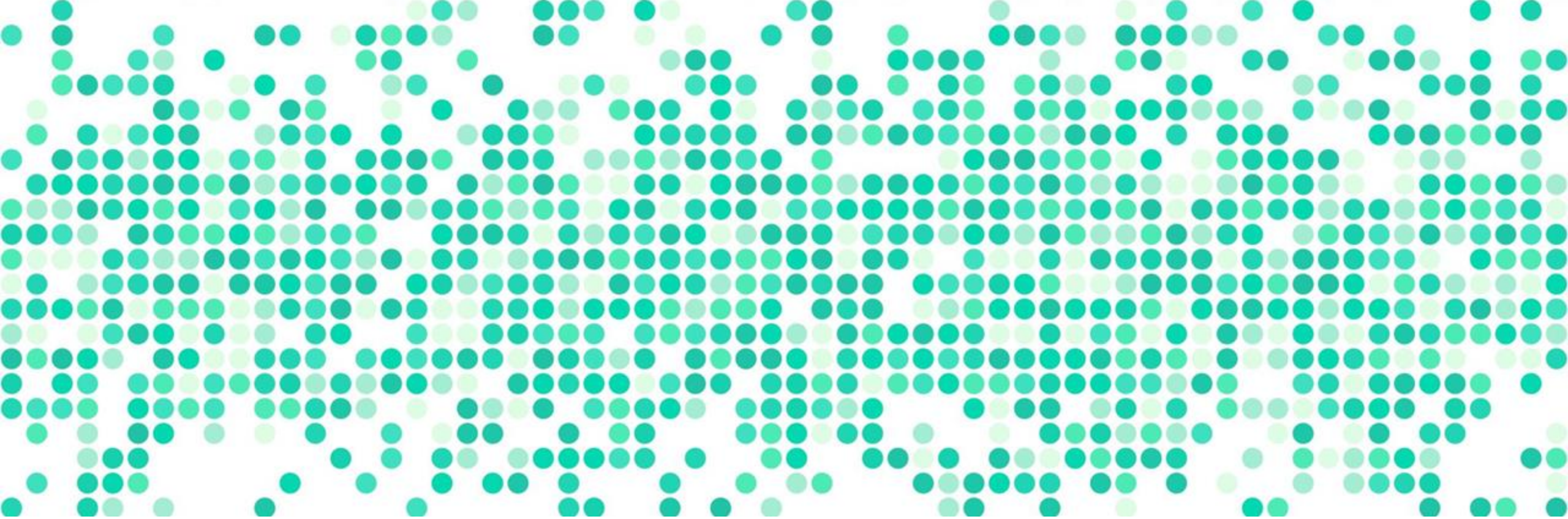

DATA ANALYSIS

Week 16: It’s a wrap!!

logistics: final

- now available: compiled resources
- take-home computational: 60% of final exam points
  - **due at 1 pm May 15 – NO LATE SUBMISSIONS**
  - open book but **NOT open person**
- in-class conceptual (on Canvas): 40% of final exam points
  - **1.30 – 3 pm May 15 – VAC South (here)**
  - **closed** book (do NOT leave Canvas page once you begin
- you can **bring**:
  - ONE handwritten help sheet
  - hypothesis flowchart
  - process sheet (packet)

Data Analysis: Compiled Resources

- **Final Exam Details**
  - Computational Exam due by **May 15 2025 1 pm ET**.
  - Conceptual Exam in class (VAC South) on **May 15 2025 from 1.30 - 3 pm ET.**
- **Office Hour / Review Session Links**
  - Prof. Kumar [Calendly link]
  - Jon's virtual review session: May 13, 5-6.30 pm ET [Zoom link]
  - Sydney's virtual review session: May 14, 5-6.30 pm ET [Zoom link]
    - Meeting ID: 950 0766 1726
    - Passcode: 109480
- **Practice exams (graded and ungraded)**
  - Ungraded practice
    - Week 1-5 Ungraded Practice
    - Week 6-12 Ungraded Practice
    - Week 13-15 Ungraded Practice
  - Midterm 1 and 2 practice exams
    - Practice Midterm 1 (Conceptual)
    - Practice Midterm 1: Computational [KEY]
    - Practice Midterm 2 (Conceptual)
    - Practice Midterm 2: Computational [KEY]
  - Final practice exams
    - Practice Final (Conceptual): 2 points towards class participation!
    - Practice Final (Computational) [KEY]

today's agenda

- which-test-when?
- conceptual questions
- course recap
- contest winners
- BCQs

which test when?

Subject	Days Before Giving Birth			
	7	5	3	1
A	39	40	49	52
B	38	39	44	55
C	44	46	50	60
D	40	42	46	56
E	34	33	41	52

The endorphins released by the brain act as natural painkillers. For example, Gintzler (1970) monitored endorphin activity and pain thresholds in pregnant rats during the days before they gave birth. The data showed an increase in pain threshold as the pregnancy progressed. The change was gradual until 1 or 2 days before birth, at which point there was an abrupt increase in pain threshold. Apparently a natural painkilling mechanism was preparing the animals for the stress of giving birth. The recorded data represent pain-threshold scores similar to the results obtained by Gintzler. Do these data indicate a significant change in pain threshold?

Repeated measures ANOVA

which test when?

Researchers have noted a decline in cognitive functioning as people age (Bartus, 1990). However, the results from other research suggest that the antioxidants in foods such as blueberries can reduce and even reverse these age-related declines, at least in laboratory rats (Joseph et al., 1999). Based on these results, one might theorize that the same antioxidants might also benefit elderly humans. Suppose a researcher is interested in testing this theory. The researcher obtains a sample of $n = 16$ adults who are older than 65, and gives each participant a daily dose of a blueberry supplement that is very high in antioxidants. After taking the supplement for 6 months, the participants are given a standardized cognitive skills test and produce a mean score of $M = 50.2$. For the general population of elderly adults, scores on the test average $\mu = 45$ and form a normal distribution with $\sigma = 9$.

One sample z-test

which test when?

Research indicates that the color red increases men's attraction to women (Elliot and Niesta, 2008). In the original study, men were shown women's photographs presented on either a white or a red background. Photographs presented on red were rated significantly more attractive than the same photographs mounted on white. In a similar study, a researcher prepares a set of 30 women's photographs, with 15 mounted on a white background and 15 mounted on red. One picture is identified as the test photograph, and appears twice in the set, once on white and once on red. Each male participant looks through the entire set of photographs and rates the attractiveness of each woman on a 10-point scale. The following table summarizes the ratings of the test photograph for a sample of $n = 9$ men. Are the ratings for the test photograph significantly different when it is presented on a red background compared to a white background? Use a two-tailed test with $\alpha = .01$.

Paired t-test / Repeated measures ANOVA

which test when?

Although the phenomenon is not well understood, it appears that people born during the winter months are slightly more likely to develop schizophrenia than people born at other times (Bradbury & Miller, 1985). The following hypothetical data represent a sample of 50 individuals diagnosed with schizophrenia and a sample of 100 people with no psychotic diagnosis. Each individual is also classified according to season in which he or she was born. Do the data indicate a significant relationship between schizophrenia and the season of birth? Test at the .05 level of significance.

Chi square test of independence

which test when?

Kirschner and Karpinski (2010) report that college students who are on Facebook (or have it running in the background) while studying had lower grades than students who did not use the social network. A researcher would like to know if the same result extends to students in lower grade levels. The researcher planned a research study comparing Facebook users with non-users for middle school students, high school students, and college students. For consistency across groups, grades were converted into six categories, numbered 0–5 from low to high.

Factorial ANOVA

which test when?

In the Preview for this Chapter, we discussed a study by McGee and Shevlin (2009) demonstrating that an individual's sense of humor had a significant effect on how the individual was perceived by others. In one part of the study, female college students were given brief descriptions of a potential romantic partner. The fictitious male was described positively and, for one group of participants, the description also said that he had a great sense of humor. Another group of female students read the same description except it now said that he has no sense of humor. After reading the description, each participant was asked to rate the attractiveness of the man on a seven-point scale from 1 (very unattractive) to 7 (very attractive) with a score of 4 indicating a neutral rating.

If assuming interval/ratio data: Independent samples t-test / Independent measures ANOVA

If assuming ordinal data: non-parametric chi-square test of independence with counts

conceptual questions

- head over to compiled resources
- look at the Practice Short Answer Conceptual Questions

- **Practice exams (graded and ungraded)**
  - Ungraded practice
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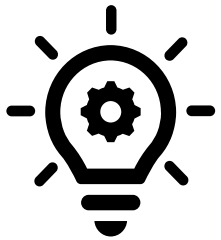
    - Practice Final (Computational) [KEY]

recap: what was 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

course outline



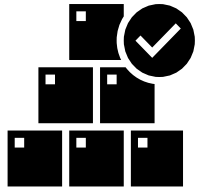
describe the *conceptual* principles behind statistical thinking and uncertainty

lectures

activities

quizzes

exams



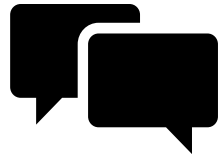
apply a *computational and statistical* toolkit to test specific claims and questions

activities

videos

problem sets

exams



communicate effectively through numbers, graphs, and scientific writing

activities

problem sets

extra credit

exams