Statistical Methods in Behavioral Science

Is the mean always the best to use?

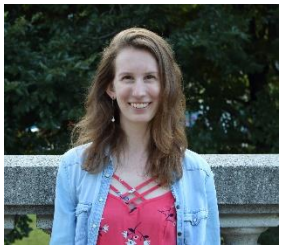
When I get a significant result, how do I interpret it?

How do I know if drinking coffee is related to creativity? What about causality?

COURSE INFORMATION:

Course Number: Psychology 343 (CRN: 33128)
Lecture Time and Location: T/TR 11:00 am-12:15 pm in BSB 119
Discussion Time and Location: F 10:00 am-10:50 am in Lincoln Hall 104

ABOUT YOUR INSTRUCTOR



Professor: Lindsay Novak (call me Professor Novak or Lindsay; pronouns: she/her)

Email: lkeera2@uic.edu (You can expect a response within 2 business days. ***Please*** email me again if you haven't heard back by then or if it's very urgent!) I will not respond to emails about assignments the day they are due.

Office location: BSB 3058C

Student (office) hours: Student hours are time that I've dedicated to meeting with all of you! I highly encourage you to meet with me throughout the semester, whether it's just to say hi or to ask questions about the course (e.g., course content, assignment questions, study tips, class resources, challenges). I'm also happy to discuss psychology, college generally, and life after college! **I will hold office hours on Tuesdays from 2-3:30 pm online via Zoom (Link:** https://uic.zoom.us/j/89245496209?pwd=ZTZ5NXR1RVByV2VkV0tFakZSZVRjdz09) **or by appointment, either in-person or online.** I always enjoy meeting with students, so don't be shy! I'm here for you. It also helps me get to know you better if I can put names with faces.

Regarding class communications and online etiquette: You must carefully read all email and Blackboard communications from the professor. Please check Blackboard and your email frequently.

A few notes about online etiquette:

- In emails, always identify yourself and what class and section you are in. It is a good practice to put your course and section in the subject line. This helps your instructor identify course-related emails. Please also use proper email etiquette for your content (e.g. full sentences, be mindful of spelling, address the email with something like "Hi Professor Novak", end the email with your name). Email is not a place for texting-like language when you are emailing your instructor.

- Please put your full name on any assignment you submit via Blackboard or email. Submit assignments in .pdf or .doc format only.

COURSE OVERVIEW & GOALS

Welcome to the wonderful world of psychological statistics! This is an introductory course that will help you better understand the science of psychology, specifically how statistics are used in psychology. I will be your guide and facilitator on this journey. I recognize that there are a range of feelings surrounding a statistics course, but my hope is to show you that statistics are important for reasons beyond just learning more math. I choose to teach this course because gaining the knowledge of how to calculate, interpret, and convey statistics is useful in many fields, not just for a career in psychology. During this course, I will do my best to help you learn a variety of statistical concepts and their application in the real world. I am excited you are here and look forward to getting to know each of you throughout the semester!

Student learning goals for the course:

To take this course, you must be majoring in psychology or a related field (e.g. Neuroscience). Upon getting a degree, I anticipate that one of the main goals is getting a job or continuing your education in the field. My job as your instructor is to help you gain skills and provide you with resources that will help you take that next step. This course builds on what you have learned so far about the science of psychology by providing you the tools to analyze, interpret, and evaluate results of research studies.



I want you to be able to learn what the numbers mean and how to convey what they mean to a broader audience, as well as develop skills for critically examining different aspects of research.
With this in mind, after this course you should:

a) Understand basic statistical concepts (Example: What is a t-test?)
b) Perform common statistical tests (Example: How do I calculate a correlation?)
c) Communicate statistical results (Example: I calculated a correlation coefficient of .8 for height and shoe size; how should I describe the relationship between these two constructs?)
d) Apply these concepts to research designs and questions used in psychology (Example: When is the mean versus median a better descriptive statistic to use?)
e) Critically evaluate statistics and understand their strengths and weaknesses (Example: If I got a significant t-test result, does this prove that my hypothesis is correct?)

These skills will make you a competitive job/graduate school candidate, a knowledgeable consumer of scientific research, and a well-informed citizen.

Course Pre-requisites: Enrollment in this course is limited to those who meet the following requirements:

- Completed PSCH 242 with a minimum grade of C
- Psychology and neuroscience majors only
- Registered for both the lecture and discussion section

Students who do not have these prerequisites will be automatically dropped from this course

COURSE FORMAT

We will meet two times a week (T/TR) for lecture, which will primarily focus on learning concepts and formulas. We will meet once a week (Fri) for discussion section, which will focus more on hands-on practice.

Lectures and discussion will be held in person, except for the first two weeks (per the University announcement), which will be online via Zoom. Please use the following link to access our class:
https://uic.zoom.us/j/84174246564?pwd=Z2pUcDBpa2dHVXZ1QWtiNmJsTDJLUT09

If you have any questions about Zoom or accessing your UIC Zoom account, please feel free to email me.

A few notes about the initial online classroom setting:
1) I strongly encourage you to use your camera and audio during class. You can blur your background or create a fun virtual background if that makes you more comfortable! I understand that there are privacy concerns for students. However, using camera and audio helps build initial connections and makes it feel more like a typical in-person class because we can have more active interaction and you can see your peers. It also honestly helps me out to as your instructor to interact with you "face-to-face" because I can get real time feedback with how the learning experience is going! Please know that you can use the chat function as well.

2) I do not plan to record the online lectures or discussion sections at this time, so if you have to miss a class, you can get notes from a classmate or contact me if you need help.

Note: The expectation is that you will attend in person, unless the University changes their protocol. If for any reason there comes a point that you are finding yourself unable to attend in-person for an extended period of time, please contact the DRC.

COURSE MATERIALS

Required text: *Statistics for the Behavioral Sciences* (Gravetter & Wallnau, 2010).
You can use any textbook edition from 7th -10th. Relatively inexpensive used copies of editions 7-9 are readily available from wherever you rent or purchase textbooks. You don't need access to supplemental material. There will also be a copy on reserve at the library.

Calculator: Please make sure that you have a calculator for exams and class. **This should be a basic calculator that you can use to add, subtract, multiply, divide, and calculate squares and square roots**. No graphing calculators allowed. I would also suggest having scrap paper on hand for working out problems!

Jamovi (a statistical analysis program): We will use Jamovi in discussion sometimes to learn an extra statistical skill and help us review our answers to practice problems. This is a free statistical program that you can download onto your computer. I will provide more details as we get further along in the class.
Download here: https://www.jamovi.org/download.html
Instructions/User manual here: https://www.jamovi.org/user-manual.html

COURSE EXPECTATIONS

What I expect from you as my students:	What you can expect from me as your instructor:
-Follow COVID policies (e.g. wearing mask over nose and mouth, social distancing when possible). You will be removed from the classroom if you are not following the covid protocol for the safety of yourself and everyone around you. *Please do not come to class if you are feeling sick.*	-I will follow all COVID policies, such as wearing a mask properly and maintaining distance as much as I can.
Class etiquette: -Be respectful of your instructor and your peers (with time, listening, actions, etc.). Do not speak over others. Be kind to each other. -If you have a question, please raise your hand and ask it. -See me earlier than later if you need help in the course -ASK QUESTIONS! There are no stupid questions.	Provide a comfortable environment by doing things like: -Giving you time and opportunity to ask questions, being respectful of you and your time, facilitating an inclusive and respectful space with an expectation that all class members will abide by this as well.
Laptops & cellphones: Laptops are fine as long as they are not distracting others. Unless using a cellphone for a poll or calculation in class, please put away cellphones during class.	Access to resources to help you succeed and navigate the course, such as: -exercises that relate to your own interests, plenty of practice problems with calculation and interpretation, incorporating different ways of explaining material

HOW YOUR LEARNING WILL BE ASSESSED

Grading: Course grades will be based on exams (60%), quizzes (20%), homework (10%), and attendance (10%).

EXAMS (60%)

There will be 2 midterm exams and a final exam, each worth 20% of your grade. Exams are not cumulative: the first exam will cover the first section of the course, and the other two exams will cover the material learned since the previous exam. However, course content is somewhat cumulative: the basic methods taught early in the course will be a part of more advanced methods taught later. **At this time, I am planning for in-person exams**.

Exam Format: The exams will ask you to engage with both calculation and conceptual knowledge (e.g. you may need to calculate your answer and also explain/interpret your results in conceptual terms). I will provide you with a formula sheet. Exams will be a mix of multiple choice, short answer, and longer-length applied questions. The exam will lean heavily on conceptual questions compared to calculation questions. *Before each exam, you will have access to practice exam problems that will have comparable formats and difficulty as your exam.*

To help reinforce learning and because no exams are dropped, there will be optional revisions for Exam 1, for which you will have the opportunity to earn some of the points back you missed (up to half credit back). More information about the revision format and due date will be given near the date of Exam 1. The option exam revisions will ONLY occur for Exam 1.

One of the best tips I can give for prepping for exams is to keep up with the material and study over the course of the weeks leading up to each exam. This will be better than trying to cram for the exam the night before!

GRADE POLICIES

Life is crazy and things can get disrupted (even outside of the pandemic)! I completely understand this – it happens to all of us! This is why I build in the ability to drop the lowest two quiz and homework scores and miss two lectures and one discussion section. There will not be makeup exams. However, under unavoidable circumstances, like serious illness or extreme personal matters (e.g., family tragedy), **I reserve the right to amend these grading policies**. If these circumstances apply to you, please contact me **right away** to make alternate arrangements on assignments or exams. If you know ahead of time that you have a scheduling conflict for an exam or other assignment, please let me know ASAP.

If you have are feeling sick, or have any symptoms of COVID-19, please do not come to class. Instead, contact me and we can make other arrangements.

An additional exception here is religious holidays. You can find the university policy at the following link: https://oae.uic.edu/news-stories/university-holidays-and-religious-observances/. Please see me one week BEFORE the holiday so we can work out an alternative plan for assignments if they will be impacted.

For any grading disputes you would like to bring up, you have one (1) week from when you receive your grade to review it and contact me. After the week has passed, I will not review it again.

QUIZZES (20%)

Short multiple-choice quizzes will be given covering the previous class material. The quizzes are designed to ensure that you keep up with the material (both lecture and readings). *Quizzes are open note and will take place online*. You will submit your quiz on Blackboard. If you do the reading and attend class you should feel well prepared for the quizzes. Quiz dates are approximate. Thus, I reserve the right to change their dates. **As of now, quizzes will be released on the date listed in the syllabus and will be due by the following class (e.g., released on Thursday and due by the next Tuesday)**. There will be eight (8) quizzes. The two lowest quiz scores will be dropped, so late or missed quizzes will not be accepted.

If you have any issues with submitting a quiz on Blackboard, please take screenshots of any errors or completed work and email me ASAP. I will work with you to resolve the problem.

HOMEWORK (10 %)

Homework assignments will consist of worksheets that help reinforce concepts we have been learning recently in class. You will be asked to complete mostly calculation problems and interpret the answers if needed, but a few of the homeworks may ask you to practice applying the data and concepts to the real world or have you come up with your own experimental designs and work through analyses related to those (tailored to make sure you can complete it in a timely manner). ***Homework is a check of your understanding of the calculations and concepts you learn in class, so homework is graded only for effort, not for correctness (i.e., it is graded pass/fail).***

There will be eight (8) homework assignments. **Homework assigments for the week will be due at the start of discussion section (Fridays at 10 am), so you will turn them into me in person (except for Homework 1, which will be submitted via Blackboard)**. Tentatively, you will be able to access the homeworks by the weekend before they are due, but I will keep you posted on their availability as the semester goes on. You can miss two (2) homeworks with no penalty for the semester**.**

ATTENDANCE (10%)

Attending lectures is the best way to keep up with the material and get the most out of the course. Not all topics we cover appear in the book and there are extra examples or key concepts I will highlight. There may be times where extra credit is given during in-class assignments, and these opportunities cannot be made up. Discussion sections are a time for us to engage in hands-on work based on the material we cover in class. This may take the form of short group assignments or individualized problem sets. In discussion, I can offer help on practice problems and we can review concepts that you find confusing.

You will get the most out of lecture and discussion if you actively engage with the material and ask questions (even though I know this can be daunting!). **To receive full points, you must attend lecture and discussion and try to actively participate (e.g., be attentive, answer**

questions, participate in group work, contribute thoughtful comments). You can miss two (2) lecture and one (1) discussion sections with no penalty for the semester, no questions asked.

Grade Breakdown

Exams	60%
Quizzes	20%
Homework	10%
Attendance	10%
Total	**100%**

Final grades will be on a standard 100-percentage scale: 90 – 100% = A; 80 – 89% = B; 70 – 79% = C; 60 – 69% = D; below 60% = F. **NOTE:** I round up any decimal above .5: e.g., 79.7 = 80 (B); 89.5 = 90 (A); 69.2 = 69 (D). There is no curve.

Note: I will give you a guide for how to calculate your final grade later in the semester

Please put your heart into this class. Mine is already there. Do the work, be happy to learn, be excited, and ask questions – that's the only way you'll learn!

ACADEMIC INTEGRITY

Don't. Cheat. If you cheat on any exam, quiz, or assignment in this class, you will be given a zero on the assignment and possibly a failing grade in the class. You will also be subject to official judicial charges by the Dean of Students. There will be no exceptions.

Cheating includes (but is not limited to): looking at other people's exams/quizzes or letting them look at yours during an exam/quiz period, copying or giving others homework answers, and copying others' written responses on homework. You are allowed to check your answers on in-class activities or homework assignments with other students, but you must complete your work independently and check answers only after you have fully tried on your own. You should be writing your answers in your own words (e.g., interpretations of results, explanations of what statistical concepts mean). For more information about violating academic integrity and its consequences, consult the website of the UIC Office of the Dean of Students at http://www.uic.edu/depts/dos/studentconduct.html.

By enrolling in this course, you agree to uphold a class honor code in which we trust one another and engage only in behaviors that reflect our community standards of academic integrity.

If any part of you feels even slightly tempted to engage in academic dishonesty for the sake of a better grade, come talk to me and I'll give you all sorts of tips and tricks to earn that grade you're hoping for.

PSCH 343 TENTATIVE COURSE SCHEDULE
Note: the course schedule is tentative and subject to change.

Week	Date	Topic	Reading	Quiz	Discussion
1 (Remote via Zoom)	1/11	Introduction to Statistics	GW Ch 1		
	1/13	Intro (cont.), Frequencies	GW Ch 2		
	1/14				Worksheet
2 (Remote via Zoom)	1/18	Central Tendency, Intro to Variability	GW Ch 3+4		
	1/20	Variability	GW Ch 4	Ch 1-4	
	1/21	Last day to add/drop classes HW 1 due Friday 1/21 at start of discussion			Worksheet
3	1/25	z-scores, Intro to Probability	GW Ch 5+6		
	1/27	Probability & Samples	GW Ch 6+7	Ch 5+6	
	1/28	HW 2 due at start of discussion			Worksheet
4	2/1	Sampling & Hyp. test	GW Ch 7+8		
	2/3	Hypothesis testing	GW Ch 8	Ch 7+8	
	2/4	HW 3 due at start of discussion			Worksheet
5	2/8	Review for Exam 1			
	2/10	Exam 1			
	2/11				*No meeting*
6	2/15	Introduction to t-statistic	GW Ch 9		
	2/17	Introduction to t-statistic, cont.	GW Ch 9		Lindsay at SPSP for 2/17-2/18
	2/18	Professor Burke covering Lec 2/17 & 2/18 Discussion			Worksheet
7	2/22	Dependent Samples t-test	GW Ch 11		
	2/24	Independent Samples t-test	GW Ch 10		
	2/25				Worksheet/Exam review
8	3/1	Optional Exam 1 revisions (done in class)			
	3/3	Review of t-tests		Ch 9+11	
	3/4	HW 4 (t-test) due at start of discussion			Jamovi/Worksheet
9	3/8	Intro to ANOVA	GW Ch 12		
	3/10	One-way ANOVA		Ch 10+12	
	3/11	HW 5 due at start of discussion			Worksheet

10	3/15	Review for Exam 2			
	3/17	Exam 2			
	3/18				*No Meeting*
SB	3/22	Spring Break			
	3/24	Spring Break			
	3/25	Spring Break			*No Meeting*
11	3/29	Two-Way ANOVA	GW Ch 14		
	3/31	Two-Way ANOVA, cont.			
	4/1				Worksheet
12	4/5	RM ANOVA	GW Ch 13		
	4/7	ANOVA Review		Ch 14	
	4/8	HW 6 due at start of discussion			Worksheet
13	4/12	Correlation	GW Ch 15		
	4/14	Correlation/Regression		Ch 13	
	4/15	HW 7 due at start of discussion			Worksheet
14	4/19	Regression	GW Ch 16		
	4/21	Regression		Ch 15+16	
	4/22	HW 8 due at start of discussion			Worksheet
15	4/26	Catchup			
	4/28	Final Exam Review			
	4/29	Last day of instruction			Review
Final	TBD	Will update when receive information			

COURSE RESOURCES

Students with Disabilities

UIC strives to ensure the accessibility of programs, classes, and services to students with disabilities. Any class I teach will welcome anyone who may need accommodations because of their disability. Reasonable accommodations can be arranged for students with various types of documented disabilities. If you have questions or need help in obtaining access and accommodations, the *Disability Resource Center (DRC)* is available to assist students and work with me as your instructor. Please contact DRC at 312-413-2183.

Getting Extra Help

If you need a little extra help, come see me as soon as possible. Besides meeting with me, the UIC chapter of Psi Chi (the international honor society in psychology) offers statistics tutoring (https://psch.uic.edu/academics/undergraduate-studies/current-students/psi-chi). You can also take advantage of the services offered by the **Academic Center for Excellence**. The staff there can help you with reading, writing, study skills, and time management. Please contact them at 312-413-0031 for some great tips!

Resources for Stress and Mental Health

Finally, juggling all the responsibilities of being a college student can be difficult for anyone! I encourage you to pursue **Counseling Services** at UIC if you are having difficulty managing these responsibilities. You can receive **free** confidential services from the UIC Counseling Center (www.counseling.uic.edu). Please contact: 312-996-3490 or visit them in the Student Services Building at the corner of Harrison & Racine. Alternatively, the Counseling Center offers the InTouch Crisis Hotline for support, referrals, and telephone crisis interventions. Please contact: 312-996-5535 (6:00 p.m.-10:30 p.m.).

Syllabus Disclaimer: This syllabus is intended to give you guidance on what will be covered during the semester, and will be followed as closely as possible. However, I may modify, supplement, and make changes throughout the semester.

*Parts of the syllabus were inspired by Rebecca Littman & current/former UIC statistics instructors