Analysis of Behavioral Data (PSYC 218 007)

Course Description and Goals

Numerical information plays a crucial role in our daily lives. Whether through scientific studies, polls, and surveys, or through informal investigations (e.g., determining the best car deal), we frequently gather and interpret data to draw evidence-based conclusions. This course provides an introduction to statistics as a tool for making sense of quantitative data. We will explore key elements of research design (how to collect data to answer specific questions), descriptive statistics (how to identify trends and patterns in datasets), and inferential statistics (how to test hypotheses and draw meaningful conclusions). Gaining experience in these areas will enhance your ability to critically evaluate others' claims about data and help you design, conduct, and analyze your own research projects.

This course is an *introduction* to statistics, so we won't be covering everything about statistics. Some concepts we'll explore might not seem relevant to understanding human behavior, but they're building a foundation you can carry forward into future courses and real-world applications. For some people, this course can be challenging. Stay committed, keep up with the material, and don't hesitate to ask for help. With effort, you'll be on your way to developing statistical literacy and gaining deeper insights into human behavior. Along the way, you might even discover something new about yourself!

By the end of this course, you will be able to:
- Differentiate between descriptive and inferential statistics.
- Calculate various statistics (e.g., means, variance, correlation) commonly used in psychology, both manually and using software.
- Understand the connections between key statistical concepts, including alpha, confidence intervals, effect size, power, variability, and sample size.
- Select and apply the appropriate statistical methods to analyze a dataset, based on the study design and research objectives.
- Draw conclusions about a research hypothesis through data analysis.
- Understand the reasoning behind statistical methods and critically assess others' interpretations of statistical results.

Land Acknowledgement

Our course is held on the UBC Point Grey campus, which is situated on the traditional, ancestral, unceded territory of the xʷməθkʷəy̓əm (Musqueam) First Nation. We acknowledge and respect the continued presence of the Musqueam people on their land.
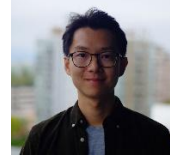
Lecture Times
Tuesdays & Thursdays
11am - 12:30pm
Location: BUCH A203

Instructor
Dr. Enda Tan
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In-Person Office Hours:
Thursdays 2pm-3pm
Location: Kenny 4226

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Mondays 3pm-4pm
Zoom link

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Fridays 11am-12pm
Location: Kenny 4202

Course Prerequisites

To enroll in this course, you must have completed PSYC 217 and declared a major in Psychology, Cognitive Systems, or Speech Sciences. This course is a core requirement for the BA Psychology major and serves as a prerequisite for the Honours program and PSYC 359 (Advanced Statistics).

Course Materials

- **Textbook:** Pagano, R. (2012). *Understanding Statistics in the Behavioral Sciences* (10th Edition). Available at the UBC bookstore. Alternately, an e-book version of this textbook is available (www.vitalsource.com).
- **SPSS Guide:** Cuttler, C. (2020). *A Student Guide to SPSS* (3rd Edition). Available at the UBC bookstore in digital and hard copy forms; either format is acceptable.
- **SPSS (Version 28 or 29):** Available for free download from https://ubc.onthehub.com.
- **Top Hat account:** [free] Please follow the instructions on Canvas for joining the course. Join code: 667586 (https://app-ca.tophat.com)
- **Scientific calculator:** You will need a basic scientific calculator (one with inverse and square root functions will be sufficient) for exams. Graphing calculators are NOT permitted during exams.

Course Website

Our course website can be accessed through UBC Canvas and can be used to download course materials, view exam grades, and find out about course announcements. Any updates to the course schedule, such as changes to deadlines for the assignments, will be announced during lectures and on the website. Lecture slides will be posted after class. Make sure to check the website regularly to find out about any changes.

Learning Assessment

Learning Assessment Activity	Date	Percent of Total Grade
Midterm 1 (Ch 1-5)	Feb 4	21%
Midterm 2 (Ch 6-9)	Mar 4	21%
Assignments (4% x 5)	Throughout term	20%
In class participation (Top Hat)	Throughout term	4%
Research Experience Component (REC)	Throughout term	4%
Final Exam (cumulative)	TBD	30%
Total		**100%**

See last page of the Syllabus for detailed course schedule.

Exams (72%): There will be two midterms (each worth 21% of the final grade) and a final exam (worth 30% of the final grade). The final exam will be longer than the midterm exams and will be cumulative, covering material from the entire course. The date and time of the final exam will be set by the registrar. The exams will include multiple-choice questions, short-answer questions, and computational questions. A formula sheet will be provided. The content will be based on both lectures and readings. The exams are designed to challenge you to go beyond mere memorization, encouraging you to integrate and apply the material.

Missing Exams. If you have a scheduled UBC-sanctioned sports event or a religious obligation that conflicts with an exam date, you must notify the instructor <u>within the first week of classes</u> to arrange an alternative. If you miss an exam for a valid reason, contact the instructor before the exam or as soon as possible afterward. Makeup exams are subject to approval and must be completed <u>within one week</u> of the original exam date unless your circumstances require more time. Missing an exam for reasons like oversleeping or forgetting the date will result in a score of "0" on the exam.

If you have three or more final exams scheduled to start and finish within a 24-hour period, you may request to write the second exam on a different day. You must make this request to the instructor giving the second exam at least one month before the exam date. If you absolutely must miss the final exam due to an extenuating circumstance like severe illness, you or your caregiver must apply for Academic Concession by contacting your Faculty's Advising Office.

Reviewing Exams. You may review your exam after midterm exam grades are released. Your TA will be available to address any questions or concerns. Requests to review your exam must be made <u>within two weeks</u> of the grades being posted. After this period, the exam will no longer be available for review.

Lab Assignments (20%): The course includes five lab assignments, each worth 4% of your final grade, designed to provide hands-on experience in analyzing and interpreting data using SPSS software. Please see the Course Schedule at the end of the syllabus for specific dates and deadlines. Each lab assignment has three components to be completed on your own time:

1. Generating Data with Qualtrics or Reading Article Information. The data for Assignments 1 and 2 will be generated by the whole class using a Qualtrics survey. This will create a dataset for class assignments and help you develop a deeper understanding of data analysis and interpretation by involving you as a participant. <u>If you fail to complete the Qualtrics survey on time, you will lose 1⁄4 (25%) of your assignment grade (i.e., 1% of your final course grade).</u> Survey links are available on Canvas. For subsequent assignments, data will come from real research articles and datasets, which may be simplified for this course. Since you are not generating the data as a participant, familiarize yourself with the research question and the variables by reading the article information on the assignment page on Canvas.

2. Student Guide to SPSS and In-Class Demonstration. After completing the online experiment or survey, you should read the corresponding chapter(s) for each lab assignment in *A Student Guide to SPSS (3rd Edition)*. The corresponding chapter(s) will be announced in class and written in the instructions for each lab assignment. These chapters provide detailed information about how to perform all the SPSS functions you will need for the lab assignments. There will also be in-class demonstrations of the main functions of SPSS required for each lab assignment.

3. Laboratory Assignment. After each in-class SPSS demonstration, you will have about one week to complete the lab assignment. These will be posted in a module called "Assignments" on Canvas. These assignments involve analyzing and drawing conclusions about the dataset your class has generated or the data from a research paper. The due dates and times for the lab assignments are listed at the end of the syllabus. <u>You will lose 1/8 (12.5%) of your assignment grade (i.e., 0.5% of your final course grade) for each day your assignment is late. Late assignments will not be accepted after 7 days. Each student is given two one-day late passes for lab assignments, which can be used separately (1 day for two</u>

assignments) or together (2 days for one assignment). Once these passes are used, standard late penalties will apply unless there are emergency circumstances.

Lab assignments must be completed individually. While you may seek assistance from teaching fellows, you must perform the analyses and write-ups independently. You may not share your work with other students, use another student's work, or use answers from AI sources (e.g., ChatGPT). You may also not post your answers to any lab assignment questions on the Canvas discussion boards. Anyone who posts any answers to any assignment questions on Canvas will receive 0 on the assignment.

In class participation (4%): Attendance at lectures is critical for success in this course, as is spending additional time outside of class to practice and review the material covered in lectures. As a rough guideline, you should expect to spend 3-5 hours outside of class for every hour of lecture (some people may need more than this). To foster engagement, I will include a few Top Hat questions in each lecture to assess understanding of key concepts and encourage discussion. Please have the Top Hat website open during lectures so you can respond to questions in real time.

Participation will be assessed as follows:

If you respond to the majority of questions in…	You will receive...
80-100% of all classes with Top Hat questions	4%
70-79% of all classes with Top Hat questions	3%
60-69% of all classes with Top Hat questions	2%
50-59% of all classes with Top Hat questions	1%
0-49% of all classes with Top Hat questions	0%

Research Experience Component (4%): The Research Experience Component (REC) is designed to help you learn more about psychology and how research is conducted by providing first-hand experience in psychology studies. For this course, you will be asked to earn _four_ research experience credits.

The Human Subject Pool (HSP) Option
Most students will choose to earn these credits by spending four hours participating in psychology studies (usually worth 1% point for each hour with some exceptions) through the Department of Psychology's Human Subject Pool (HSP) system. You can locate, create an account, and sign up for studies by going to https://hsp.psych.ubc.ca. Please register in the system by the end of the first month of classes to have the opportunity to earn your first ½ hour credit with a brief online survey that will increase your eligibility for more studies.

Once registered in the system, you will be able to browse through and select which studies you wish to participate in, sign up for an available timeslot, and confirm your accumulated credits afterward. At the end of the last day of class for the term, the subject pool is closed. At that point, you will no longer be able to receive credits. I strongly urge you to participate in and confirm your credits long _before_ the last week of class since many studies will not offer timeslots near the end of the term and you may be locked out before allocating your credits to your desired course. Further instruction on how to use the HSP online system can be found at https://psych.ubc.ca/undergraduate/opportunities/human-subject-pool/.

HSP Online Study Credit Limit (NEW PILOT PROGRAM): We will no longer have an online credit limit. Instead, students are free to receive their HSP bonus credits from any combination of "in-lab" and

"online" studies. However, "in-lab" studies will offer a bonus 0.5 credits on top of the standard 0.5 credits per 30 minutes of participation (e.g., a 1 hour "in-lab" study will award 1.5 credits, while an equivalent "online" study will award 1 credit).

The Library Option

As an alternative to participation in psychology subject pool experiments, you may complete a library-writing project. Such projects consist of reading and summarizing 1) the research question, 2) the methods and 3) the results (in written form) of a research article from the peer reviewed journal *Psychological Science*. You will receive one (1) research participation credit for each article summary that meets the following requirements.

Requirements:
- The article must have been published in the journal titled "*Psychological Science*"
- The article must have a publication date from the year 2000 to present (i.e. papers from 2001 are acceptable; those from 1999 or earlier are not)
- The article must be a research article; it cannot be a review article, a news item, a notice, or a letter to the editor, for example
- The summary should be approximately 500 words in length
- You must include your name, student number, course, section, instructor and email address on each summary
- You must log on to the Human Subject Pool (HSP) system (http://hsp.psych.ubc.ca/) and create an account before submitting your article summaries. Your credit is assigned using the online system.
- Summaries must be submitted no later than 10 days before the end of classes.

You are to submit your article and your summary to turnitin.com. If you don't have a Turnitin account already (from a previous course), you will need to create a user account in Turnitin. For the library assignment the class ID is 46712531, class name is "HSP 2024-2025 W2" and password is "Research". See www.turnitin.com, and click on the "Training" link at the top of the page for detailed instructions on how to submit papers to Turnitin. Any student who is suspected of plagiarism will, at a minimum, not be granted credit, and their course instructor will be notified. Further action may be taken at a departmental or university level.

Psychology Department Grading Policy 2024/25

In the Psychology Department, we aim to offer learning experiences that welcome and challenge all students to engage meaningfully in our discipline. We strive for grades that accurately reflect student learning and achievement of course learning objectives, rather than solely reflecting their performance relative to others.

In Psychology at UBC-V, we employ department-wide grading standards to promote equitable alignment, supporting students and course instructors as they learn and teach across many diverse courses and sections. For each Course Section, instructors should aim for a grade average in the following Target Ranges (before any bonus HSP points are added, but including any mandatory HSP points): **B- (68-71%) in Introductory 100-level and 200-level courses;** B (72-75%) in Intermediate 300-level courses; B+ (76-79%) for Advanced 400-level courses and Selective-Entry lower-level courses (e.g., PSYC 277, 278, 312, 370, 371, 349, 359, 365). Ranges are intended to provide some flexibility to instructors and account for differences that can occur between classes. Ranges increase across year levels to account for improvements in student learning, and students' ability to self-select into more specialized courses.

During the course, instructors may choose to adjust grades and/or difficulty of the assessments, to align with the Target Range. At the end of the course, if the average falls outside the Target Range (either direction), instructors will typically be expected to use a linear transformation to adjust final grades (i.e., add or subtract the same number of points to all students' marks, while ensuring no student fails the course due to this transformation). If a course mean falls in within one +/- letter grade band above the Target Range (e.g., in the B+ range for Intermediate courses), and the instructor believes these grades to be justified, the instructor may submit a justification request using the departmental approval final grades submission form, and the grades may stand. This Upper Range is intended to inspire further excellence in learning and teaching, and allow for the possibility that some classes select for higher performing students. Courses with means exceeding the Upper Range will be expected to provide justification as well as use a linear transformation to fall within the Upper Range.

Grades are not official until they appear on students' academic record. Students will receive both a percent and a letter grade for this course. At UBC, they convert according to the key below:

A+	90-100%	B+	76-79%	C+	64-67%	D	50-54%
A	85-89%	B	72-75%	C	60-63%	F	0-49%
A-	80-84%	B-	68-71%	C-	55-59%		

Support Resources and Early Alert

University students often encounter setbacks from time to time that can impact academic performance. If you run into difficulties and need assistance, I encourage you to contact me. I will do my best to support your success during the term. This includes identifying concerns I may have about your academic progress or well-being through Early Alert. With Early Alert, faculty members can connect you with advisors who offer students support and assistance getting back on track to success. Only specialized UBC advisors are able to access any concerns I may identify, and Early Alert does not affect your academic record. For more information about Early Alert, visit http://earlyalert.ubc.ca.

Additional resources may also be helpful as you contend with the challenges of taking university courses, and just dealing with life's challenges more broadly.
• Assistance with working remotely: https://it.ubc.ca/ubc-it-guide-working-campus
• Guidance on useful skills for students: https://learningcommons.ubc.ca/student-toolkits/
• Student's guide to Canvas: https://students.canvas.ubc.ca/
• Counselling Services: http://students.ubc.ca/livewell/services/counselling-services
• Wellness Centre: http://students.ubc.ca/livewell/services/wellness-centre
• Student Health Services: http://students.ubc.ca/livewell/services/student-health-service

In the Classroom

University courses are spaces for learning and rigorous intellectual inquiry where everyone should feel included and respected, regardless of race, ethnicity, gender identity, gender expression, sexual orientation, political or religious affiliations, ability, age, social status, or any other characteristic. Students are encouraged to engage thoughtfully with the course material and to express their perspectives in a manner that respects all class members. It is essential to contribute to an environment of mutual respect and consideration. Please review

UBC's policy on building and maintaining a respectful learning environment. Additional resources on equity, diversity, and inclusion can be found on the Psychology Department's website: Equity & Inclusion in Psychology.

Access and Diversity

UBC is dedicated to providing equal educational opportunities for all students, including those with documented physical or learning disabilities. If you have a disability that may impact your learning or exam performance, please visit UBC Access and Diversity to take the necessary steps to support your success at UBC.

Copyright and Intellectual Property

All course readings are copyrighted and cannot be redistributed without permission from the copyright owner. Similarly, lecture videos and other course materials are the intellectual property of the instructor(s) and cannot be redistributed in any form (e.g., posting on external websites or sharing through other means) without explicit instructor permission. Violating these policies may result in academic discipline.

Academic Misconduct

Cheating on exams will result in a score of 0 for that exam. Lab assignments must be completed independently. Sharing your answers to lab assignment questions or using another student's work is considered cheating and will result in a score of 0 for that assignment. Using another student's Top Hat account to answer questions for them is also considered cheating. If you are caught with more than one Top Hat account in class, you will both receive a 0 for course participation. All forms of academic misconduct will be reported to the university for appropriate action.

Psychology Department's Position on Academic Misconduct

Cheating, plagiarism, and other forms of academic misconduct are very serious concerns of the University, and the Department of Psychology has taken steps to alleviate them. In the first place, the Department has implemented software that can reliably detect cheating on multiple-choice exams by analyzing the patterns of students' responses. In addition, the Department subscribes to Turnitin – a service designed to detect and deter plagiarism. All materials (term papers, lab reports, etc.) that students submit for grading will be scanned and compared to over 4.5 billion pages of content located on the Internet or in Turnitin's own proprietary databases. The results of these comparisons are compiled into customized "Originality Reports" containing several sensitive measures of plagiarism; instructors receive copies of these reports for every student in their class.

In all cases of suspected academic misconduct the parties involved will be pursued to the fullest extent dictated by the guidelines of the University. Strong evidence of cheating or plagiarism may result in a zero credit for the work in question. According to the University Act (section 61), the President of UBC has the right to impose harsher penalties including (but not limited to) a failing grade for the course, suspension from the University, cancellation of scholarships, or a notation added to a student's transcript.

All graded work in this course, unless otherwise specified, is to be original work done independently by individuals. If you have any questions as to whether or not what you are doing is even a borderline case of academic misconduct, please consult your instructor. For details on pertinent University policies and procedures, please see Chapter 5 in the UBC Calendar (http://students.ubc.ca/calendar) and read the University's Policy 69 (available at http://www.universitycounsel.ubc.ca/policies/policy69.html).

Unless explicitly authorized by the instructor, use of generative AI (e.g., Chat GPT, OpenAI) for lab assignments is not permitted and will be considered academic misconduct.

University Policies

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious and cultural observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available here (https://senate.ubc.ca/policies-resources-support-student-success/).

COURSE SCHEDULE

Any changes to this schedule will be announced during lectures and on the course website.

Week	Date	In-Class Topic	Pagano Reading	Out of Class Event	In Class Event
1	Tue Jan 7	Course Intro, Math Review	Ch 1 & 2	**Sign up for Top Hat**	
	Thu Jan 9	Measurement Basics, Frequency Distributions	Ch 2 & 3		
2	Tue Jan 14	Central Tendency, Variability	Ch 4	**Qualtrics survey due by 11:00am**	
	Thu Jan 16	Central Tendency, Variability, Normal Curve	Ch 4 & 5		
3	Tue Jan 21	Normal Curve, Standard Scores	Ch 5		SPSS Demo 1
	Thu Jan 23	Catch-up, Review	Ch 5		
4	Tue Jan 28	Correlation	Ch 6	**Assignment 1 due by 11:00am**	
	Thu Jan 30	Correlation	Ch 6		
5	Tue Feb 4	Regression	Ch 7		
	Thu Feb 6	Regression	Ch 7		
6	Tue Feb 11	**Midterm 1**	Ch 1-5		
	Thu Feb 13	Random Sampling and Probability	Ch 8		SPSS Demo 2
7	Tue Feb 18	Reading Break			
	Thu Feb 20				
8	Tue Feb 25	Binomial Distribution	Ch 9	**Assignment 2 due by 11:00am**	
	Thu Feb 27	Hypothesis Testing	Ch 10		
9	Tue Mar 4	**Midterm 2**	Ch 6-9		
	Thu Mar 6	Sign Test	Ch 10		
10	Tue Mar 11	Power	Ch 11		SPSS Demo 3
	Thu Mar 13	Sampling Distributions; z-tests	Ch 12		
11	Tue Mar 18	z-tests	Ch 12	**Assignment 3 due by 11:00am**	
	Thu Mar 20	Student's t-test for single samples	Ch 13		SPSS Demo 4
12	Tue Mar 25	Dependent samples t-tests	Ch 14		
	Thu Mar 27	Independent samples t-tests	Ch 14	**Assignment 4 due by 11:00am**	
13	Tue Apr 1	ANOVA	Ch 15		SPSS Demo 5
	Thu Apr 3	ANOVA	Ch 15		
14	Tue Apr 8	Catch-up, Review		**Assignment 5 due by 11:00am**	
The **final exam** is scheduled for **Sunday, April 27, 2025, from 12:00 PM to 2:30 PM**.					