Psychology/Neuroscience 201: Statistics and Research Methods in Psychology
Spring 2025

MWF, 9-9:50am in Taylor Science Center G042

Professor Jen Borton (she/her/hers)
Email: jborton@hamilton.edu

Welcome to Psych Stats! A primary goal of this course is for you to understand and use statistical methods so that you can critically and appropriately evaluate not only academic reports, but also information presented in non-academic settings (e.g., the internet, newspapers, social media). I encourage you to "dig in" deeply, engage and work consistently because this course provides a background for all upper-level courses in Psychology and Neuroscience, including the Senior Project experience.

We're here to help you!

Prof. Borton's office hours in SCCT 3032

Mon. & Fri., 3:00 – 4:30pm
or by appointment

My office hours are an opportunity for you to connect with me, ask questions about/get help with course content, and find support. I welcome you to stop by!

Student TAs & hours

Teaching Assistant	Email
Matthew Dooley '27	mdooley
Sarah Morgan '27	semorgan
Rachel Zou '26	rzou

Every Sunday from 1-5 and 7-9pm
in room SCCT 3025 (the Stats Lab)

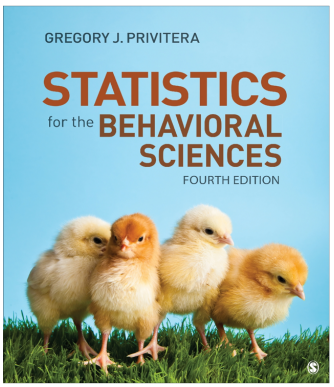
Keypad code to enter the Stats lab: 70243

QSR Center
Drop-in hours in CJ 303
Thurs., 4-7pm (Hope Obolanle) and Sun., 4-6pm (Andreas Molnar)

Facilitated study groups with Georgia Brown (times TBD)

Student homework graders
Hadley Rogers '26 (hrogers)
Smirithi (Smurf) Menon '27 (smenon)
Christina Monroe '27 (cmonroe)

Required textbooks



Privitera, G. J. (2023). *Statistics for the behavioral sciences (4th ed.)*. Sage.

Morling, B. (2021). *Research methods in psychology (4th ed.)*. Norton.

Both are available as e-book or hard copy for rental or purchase. Be sure you have the 4th edition of each. The Hamilton bookstore price matches; let them know if you find either book at a lower price elsewhere. A copy of each is also available for use in the Psych Stats lab.

You'll also need a simple calculator that is not your phone.

A few things to put you at ease if you're feeling a little nervous about Psych. Stats:

* You don't need a math background to do well in this course. Honest!

* You have the option to correct all of your homework assignments for full points.

* Relax. You will be just fine and I'm here to help in any way that I can!

Course Description and Goals

Learning statistics will empower you! It's my hope that the knowledge and skills you gain in this course will help you become a critical consumer and producer of information. We depend on statistics in many important aspects of our lives, such as in making medical decisions, choosing the best product or service, or evaluating claims made in the popular media. This class will take consistent, steady work and discipline, but it will be worth it! Students in advanced Psych and Neuro courses frequently report making use of their notes and the SPSS instructions booklet (a.k.a. "The Yellow Book"), so be sure to hang onto your materials at the end of the semester. Along the way, we will engage with some of the broad educational goals set forth by Hamilton College, such as:

> **Analytic Discernment:** You'll learn the statistical techniques necessary to analyze data collected using a variety of methods. You'll learn to analyze data both by hand and using software.
>
> **Disciplinary Practice:** You'll learn appropriate research methods employed by psychologists and neuroscientists to answer a variety of research questions as well as how to perform data analysis using the Statistical Package for the Social Sciences (SPSS) computer program.
>
> **Communication and Expression:** In this class you will also learn how to clearly communicate research results in American Psychological Association (APA) style and will practice those skills on homework assignments throughout the semester.

By the end of the course, you should have a strong understanding of not only the methods and statistics themselves, but also how to use them appropriately in conducting research. You should be able to evaluate the appropriateness of methods and statistical results reported in academic journals and the popular press (e.g., newspapers, television, magazines). This course also provides essential background for upper-level courses in Psychology and Neuroscience.

How Will We Achieve These Goals?

Active engagement, extensive practice, and spaced learning are the best ways to build a deep and lasting understanding of the material. There is no easy way to learn statistics; as with most things in life, you will get out of this course only as much as you are willing to put into it. By engaging fully with the course activities (attending class, taking notes, reading the text and completing assignments) you will gain the ability to understand methodological and statistical concepts that you can apply to real-life problems. You've got this!

Reading and Preparation for Success

Reading assignments for each class are listed in the syllabus. I recommend allocating 2-3 hours to read each chapter. You are expected to complete the reading **prior** to coming to class. You will likely have trouble understanding the class material if you have not yet completed the assigned reading. Because everything you learn in statistics builds on what came before it, I strongly advise you not to fall behind. If you don't understand something, see me or the TAs ASAP. Please do not let embarrassment or uncertainty prevent you from coming to office hours, even if it's about something we covered a while back. I expect that some concepts you initially found bewildering will lead to "Ah-ha!" moments as you continue to practice the material. Try to recognize when something doesn't make sense to you so that the TAs and I can help you!

The textbooks in this course are user friendly – settle in with your reading, keep your pencil (and, if you're like me, an eraser) handy, and challenge yourself to work actively on problems as you read. The Privitera textbook offers Learning Checks, end-of-chapter summaries, SPSS exercises, and answers to the even-numbered homework problems. Morling includes "Check Your Understanding" opportunities and chapter reviews. I encourage you to make use of all the resources available to you.

Course Requirements/Learning Opportunities

Homework Assignments (posted on Bb)

The purpose of the weekly homework exercises is to help solidify your understanding and to give you extensive practice with the material. Homework assignments are due via Gradescope* before the beginning of class on the date listed in the syllabus. Homework assignments involve hand computations of statistics, creation of tables and figures to graphically represent data, SPSS analyses, and APA-style written summaries of statistical findings. **Expect to spend several hours on these assignments; I advise starting early in the week and not leaving everything until Sunday.** Note that even if we don't get to the SPSS component of a statistical test until Friday's class, you can rely on your SPSS guide and/or your textbook.

Please be sure to write legibly and list the problems in order. Showing your step-by-step solution is extremely important; you need to show enough work on the page that you could receive partial credit even if the final solution is incorrect. Due to the amount of material we need to cover in the course, you will not always have the most recent homework graded before an exam, but feel free to consult with the TAs or me if you want to verify an answer.

The first homework has an SPSS component, so it is critical that you install the Citrix Workspace App on your laptop during the first week of class so you can access SPSS. See https://www.hamilton.edu/offices/lits/rc/installing-the-citrix-client-on-your-computer for instructions. There's also a video available at https://www.youtube.com/playlist?list=PLleE3uv8kr3ijiktcH_G5UvMS_k-klts8. Don't wait until just before you start the homework, in case you run into trouble. If you don't have a laptop, you can access SPSS via Citrix on any public lab computer on campus.

Please note: Off-campus access to SPSS via Citrix requires a VPN (virtual private network). See the yellow SPSS packet for details on how to request and gain access if you expect to need SPSS while away from campus. Please get in touch with me as soon as possible if you foresee any difficulties.

*You will submit each homework assignment as a *single* pdf file on Gradescope. See p. 16 of the SPSS packet for instructions. Here's a link to an instructional video on how to submit pdf homework assignments: https://www.gradescope.com/get_started#student-submission. To learn how to view your homework (and exam) feedback, see: https://www.gradescope.com/get_started#student-submission-view

All homework must be submitted in order to pass the course. Late or incomplete homework will receive a grade of zero. Because life is unpredictable at times, each student will receive *one* no-questions-asked **Late Homework Pass** (with the late homework to be submitted *before the start of Wednesday's class*). To take advantage of your late pass, you must indicate for which homework you are using it via the "Late HW Pass" Google form on Bb; the late pass must be submitted before the homework was originally due (e.g., no later than 9am Monday).

Homework Corrections

Because my ultimate goal (and yours, I hope!) is for you to deeply understand the material, you will have the opportunity to submit one corrected version of each homework for a higher grade as long as your **first attempt is complete** (i.e., you made a good-faith effort and did not skip any problems). The higher grade will be the one recorded. You need re-do only those problems you answered incorrectly the first time. Homework corrections are due via Gradescope no later than 11:59pm on Thursdays. Corrections will be submitted as a new assignment in Gradescope (labeled as corrections). Corrections for late homework assignments that received a zero may still be submitted for feedback, but the grade will remain a zero.

Exams

You will take four exams in this course, plus a cumulative final (see section below about the final). Exams are designed to assess your deep understanding of the material, and generally include short answer questions, short essays, and calculations/interpretations. Previous students have appreciated having more than 50 minutes to complete exams, so exams are held in the evening on the dates listed in the syllabus. We have two rooms (**SCCT G041 and G042)** so that you can spread out; students from both sections of Psych Stats will take their exams at the same time. TAs will be available to distribute and collect exams and answer questions. You may come anytime between 4-10pm; the exams should generally take you 1.5 – 3 hours. Leave yourself plenty of time; the TAs will not stay past 10pm. You will be permitted to **bring a calculator (not your phone) to exams**. You will be provided with formulas and any necessary statistical tables. The formula sheets for each exam are provided on Bb under "Exam stuff" so you can see ahead of time what formulas will be provided. Please inform me at the beginning of the semester if you have a conflict with any of the evening exams.

Final Exam

The final exam will be an open-book, open-notes practical exam using SPSS. You will be given data sets for two different hypothetical studies and will analyze and interpret the data to test different hypotheses. We'll talk more about the final as it approaches, and we'll do practice problems together in class. Seven practice problems are already posted to Bb if you're curious and want to take a look.

Extra Credit Opportunities

You may earn a maximum of 3 extra credit points using any combination of the following methods; each submission is worth up to 0.2 points added to your final grade for the course. Extra credit may not be used to increase a final grade from an A to an A+ or from a failing to a passing grade.

Participating in Research Studies

You may earn extra credit by participating in research studies conducted by faculty and students in the Psychology Department. For every 30 min. of participation, you will be awarded 0.2 extra-credit points toward your final grade. You may sign up for studies on SONA (http://hamilton.sona-systems.com). If you miss two sessions without 24-hour prior cancellation (there is no penalty to cancel), your SONA access will be revoked and you will be ineligible for extra credit via research participation for the rest of the semester. Sona closes at 4pm on the last day of classes; you are responsible for making sure your participation tally is accurate. If your tally is inaccurate or you are having difficulty accessing the web-based interface, please contact sona@hamilton.edu.

Understanding Statistical Analyses in Journal Articles

You may earn extra credit by reading an empirical journal article describing original psychological research and writing a summary that explains the statistical analyses used and why they were appropriate to answer the research question. The article must use a statistical test you learned in this class. To receive extra credit, your explanation must be correct. Be sure email me a pdf of the article along with your summary. You may not submit the same extra credit assignment in more than one class, and may only submit one summary/explanation per week (i.e., you can't turn in several on the last day of class). Submissions will be accepted up until 4pm on the last day of classes.

Attending Departmental Lectures/Colloquia

You may earn extra credit by attending talks sponsored by the Psychology Department or Neuroscience Program. To earn the equivalent of a Sona point (e.g., 0.2 points extra credit), email a paragraph to me summarizing the talk and describing what you found most interesting about it. Paragraphs should be submitted no more than a week following the talk.

Grading

Assignment	% of grade
Weekly homework assignments	24
Exams (4 @ 15% each)	60
Final Exam	16
Total	100

I reserve the right to modify the grading system either for the class as a whole or for individual students, depending on circumstances that arise.

Grade	% of points		Grade	% of points
A+*	97.5-100		C	73.5-77.4
A	93.5-97.4		C-	70.5-73.4
A-	90.5-93.4		D+	67.5-70.4
B+	87.5-90.4		D	63.5-67.4
B	83.5-87.4		D-	60.5-63.4
B-	80.5-83.4		F	60.4 or less
C+	77.5-80.4			

*A+ cannot be earned by extra credit

Quick Reference Exam Dates

(all on Mondays, any time between 4pm and 10pm in SCCT G041 or G042)

Exam 1: February 10
Exam 2: March 3
Exam 3: April 7
Exam 4: April 28

Final Exam: Sunday, May 18, 2025 (7-10pm) in SCCT G042, 3023, or 3039

This will be you after the final exam in May!

Course Policies

Attendance, Classroom Expectations, and Technology Use

Attendance in class is critical for success in this course. Please arrive on time (having read the day's material), stay engaged, and ask questions. Tablets/iPads for notetaking are permitted, but should be switched to airplane mode. Be sure your laptops and cell phones are switched off and put away during class. Aside from the distraction laptops present to both the users and other students, research demonstrates that handwriting (versus typing) notes leads to better understanding and recall of the material[1]. (I encourage you to read the Flanigan et al., 2024 meta-analysis referenced below!) If you have a documented accommodation allowing for laptop use, please come chat with me.

Illness/Missing Class

If a circumstance arises at some point during the semester that may cause you to miss class (e.g., illness, family emergency, travel for athletics), you are responsible for letting me know ahead of time. Otherwise, I expect that you will be present for every class session. I take attendance. I do not video-record class, so if you are absent you should promptly get notes from a peer, visit office/TA hours and/or review resources on Bb to catch up on the missed material and/or activities.

Blackboard, Email, Gradescope

All course materials (e.g., Powerpoint slides, homework assignments, Gradescope link) will be posted to Blackboard (available via the Tools menu on My Hamilton or at https://blackboard.hamilton.edu). The TAs, graders, and I will use Bb and Gradescope to send out announcements to the class, so **please be sure to check your email daily.** You should also feel free to email me with any questions you may have about the course, though anything requiring a detailed explanation may be better suited to a discussion during office hours. Emails sent during regular business hours will likely receive a reply within a few hours; evening and weekend emails may wait until the next business day.

Exam Rescheduling

If you experience a circumstance that interferes with an exam (e.g., family or medical emergency, another exam at the same time) and you need to reschedule it, you must email or talk with me **prior** to the exam (no later than 10am the day of the exam). You will not be penalized for asking, and I will do my best to try to accommodate your needs. If a pre-approved College-sanctioned activity (athletic contest, religious observance) conflicts with the exam schedule, please notify me within the first two weeks of the semester. Make-up exams can be taken early or a few days following the regular exam date.

Honor Code

The Honor Code helps us maintain a community based on trust and integrity. I take it very seriously and expect you to do so as well. Please re-read the Hamilton Honor Code to be clear about what is expected of you. Although you are encouraged to study in groups and to see the TAs if you have questions about your homework, any homework assignment or exam you submit must be your own work. For example, on homeworks in which you are asked to make up a study and generate your own data, you are free to talk through your ideas with others, but you may *not* share ideas or data. Similarly, you may not share your homework (or images of it) with other students. If a peer is confused or has a question, you are welcome to help explain a concept to them using a hypothetical problem, but *not* using your own homework answers. If you or a peer are struggling to understand a concept or problem, please ask me or the TAs for help. Any instance of academic dishonesty will be referred to the Honor Court.

Incompletes

Students who are prevented from completing the course due to special circumstances beyond their control (e.g., death of a close family member/friend, illness, accident) are eligible for an incomplete. If you would like to apply for an incomplete, you must contact the Dean of Students office.

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[1] Flanigan, A. E., Wheeler, J., Colliot, T., Lu, J., & Kiewra, K. A. (2024). Typed versus handwritten lecture notes and college student achievement: A meta-analysis. *Educational Psychology Review*, *36*(3). https://doi.org/10.1007/s10648-024-09914-w

Resources and Support

If you need help this semester, I hope you will reach out. Your academic success *and* mental health are both very important to me. I am available to discuss any struggles you might be experiencing. Below are some helpful resources.

Course Support

If you need academic help during the semester, use any or all of the helpful resources available to you: visit my or the TAs' open hours, contact me via email to make a one-on-one appointment, visit the QSR Center (see below), and/or form a peer study group. The TAs for the course are knowledgeable, friendly, and communicate well, so I encourage you to make full use of their office hours. Meeting with them and/or me regularly will increase the likelihood that you grasp course concepts well. Please use the homework and exam feedback to identify weakness patterns (e.g., conceptual short answers, computations) and/or gaps in your understanding so we can better support you. Know that we will meet you wherever you are— please brave the first step so we can help you!

Quantitative and Symbolic Reasoning (QSR) Center

The QSR Center (CJ 303) offers drop-in and individual tutoring as well as weekly facilitated group study sessions for specific courses. Specifically for this course, drop-in tutoring is available on Sundays from 4-6pm and Thursdays from 7-9pm. You are welcome to come to the QSR as often and for as long as you would like. Georgia Brown (a QSR tutor who has also served as a TA for the course before) will offer weekly facilitated group study sessions; those who sign up commit to attending weekly for the semester. Stay tuned for an email from Georgia about those sessions.

Accessibility and Accommodations

I encourage anyone eligible to receive accommodations to speak with me regarding necessary arrangements. I'm more than happy to work with you, but it may take a little planning, so be sure to talk with me during the first two weeks of the semester. All discussions will remain confidential. You should also contact Assistant Dean for Accessibility Resources Allen Harrison in the Dean of Students Office (Elihu Root House; 315-859-4021); he coordinates services for students with disabilities.

Support for Multilingual Students

Multilingual speakers whose first language is not English are encouraged to contact me if they have concerns about exams or assignments. We can discuss possible accommodations. You can also contact Laura Widman, coordinator of multilingual student support, lwidman@hamilton.edu, for further assistance. For more information, please visit: https://www.hamilton.edu/academics/centers/esol.

ROOTS: Support for Students of Color in STEM

ROOTS is a student-run organization designed to help support students of color interested in careers in STEM (science, technology, engineering, and mathematics). ROOTS helps build community and foster academic and professional development. Weekly meetings are held on Wednesdays at 7pm in SCCT 2048. Feel free to reach out at rootstem@hamilton.edu or visit the ROOTS website for more information.

Mental Health Support

Life can be stressful and we all need help sometimes; don't be afraid to reach out for support if you need it. The Counseling Center, located in the Johnson Center for Health and Wellness (www.hamilton.edu/offices/counselingcenter, 315-859-4340), offers individual and group therapy, peer counseling (peercoun@hamilton.edu), psychiatric treatment, and a 24/7 hotline (call for immediate help, option 2). If you want off-campus help, call 1-800-273-TALK or text "START" to 741-741. You may also reach out to the Dean of Students office (dosdept@hamilton.edu; 315-859-4600), your academic advisor, your RA, or your residence hall area director. **If at any time you feel suicidal or in danger of harming yourself or others, please reach out for support! The Hamilton community cares and is available to help. Campus Safety is available 24/7 for urgent concerns at 315-859-4000.**

Class Schedule

P = Privitera statistics text [P: 1 = read Privitera, chapter 1]; M = Morling research methods book
Readings should be done prior to the day's class. HW is due before class on day listed.

Date		Topic	Readings/Videos	Assignments Due
1/22	W	Course introduction	Syllabus!	Syllabus quiz (on Bboard) due by 5pm
1/24	F	Levels of measurement	P: 1; M: 1, 3 (pp. 56-59), 5 (pp. 117-124)	
1/26	Sun.	7-8pm in G042 (our classroom) Meet the TAs/graders and get Citrix/SPSS set up on your laptop. Snacks provided!		
1/27	M	Frequency distributions/graphs	P: 2 (skip 2.4); M: 6 (pp. 153-165) Before class, watch the 33-minute SPSS instructional video I created (Bboard). Follow along with the yellow packet.	
1/29	W	Summarizing data: Central tendency	P: 3 (Appendix B reviews basic math concepts); M: 2 (pp. 23-36)	
1/31	F	Summarizing data: Variability	P: 4; M: 2 (pp. 36-53)	
2/3	M	Summarizing data: Variability, cont'd		**HW 1** (levels of meas., intro to SPSS, freq. dist. & graphs, central tendency)
2/5	W	Z scores & normal distributions	P: 6: Skip 6.7 (pp. 214-219)	
2/7	F	Z scores & normal distributions, cont'd	**Bring Z table to class**	
2/10	M	Exam Review **EXAM 1 (4-10pm)**		**HW 2** (variability, Z scores)
2/12	W	Probability & sampling distributions	P: 7 (skip 7.4)	
2/14	F	Hypothesis testing (one sample z test)	P: 8 (pp. 265-287, skip 8.3)	
2/17	M	Hypothesis testing, cont'd (errors, effect size, power)	P: 8 (8.3 and pp. 287-308) https://rpsychologist.com/d3/cohend/	**HW 3** (sampling distribs, hyp. testing)
2/19	W	Hypothesis testing, cont'd (one sample *t* test)	P: 9 (pp. 316-326)	
2/21	F	Hypothesis testing, cont'd (confidence intervals, SPSS)	P: 9 (pp. 327-342)	
2/24	M	Research design	M: 3 (pp. 60-65; 70-77), 8 (pp. 219-227), 9	**HW 4** (hypothesis testing)
2/26	W	Research design, cont'd	M: 10 (pp. 277-291)	
2/28	F	Research design, cont'd	M: 11 (334-337; 342-357)	
3/3	M	Exam Review **EXAM 2 (4-10pm)**		**HW 5** (research design)
3/5	W	Between-subjects designs I: Independent groups t test	P: 10 (pp. 351-364)	
3/7	F	Independent groups t test, cont'd	P: 10 (pp. 364-378)	

Date		Topic	Readings	Assignments Due
3/10	M	Between-subjects designs II: Oneway ANOVA	P: 12 (pp. 426-436)	**HW 6** (ind. samples *t* test)
3/12	W	Oneway ANOVA, cont'd	P: 12 (pp. 437-466)	
3/14	F	Oneway ANOVA, cont'd		
		SPRING BREAK!		
3/31	M	Methodological aspects of within-subjects designs	M: 10 (pp. 292-302)	
4/2	W	Within-subj. designs I: Paired samples t test	P: 11 (pp. 388-404)	**HW 7** (one-way ANOVA)
4/4	F	Paired samples t test, cont'd Activity: Choosing which statistical test to use	P: 11 (pp. 405-415)	
4/7	M	Exam Review **EXAM 3 (4-10pm)**		**NO HOMEWORK!**
4/9	W	Within-subjects designs II: Repeated-measures ANOVA	P: 13 (pp. 477-493)	P: 13 (pp. 494-514)
4/11	F	Repeated-measures ANOVA, cont'd		
4/14	M	Repeated-measures ANOVA, cont'd		**HW 8** (paired samples t test)
4/16	W	Correlation	P: 15 (pp. 588-615) M: 8 (pp. 203-219)	
4/18	F	Correlation, cont'd		
4/21	M	Linear regression	P: 16 (skip 16.9 – 16.11)	**HW 9** (rep-meas. ANOVA)
4/23	W	Multiple linear regression		
4/25	F	Activity: Choosing which statistical test to use; interpreting SPSS output		
4/28	M	Exam Review **EXAM 4 (4-10pm)**		**HW 10** (correl, regression)
4/30	W	Chi-square	P: 17 (no hand calculations; skip 17.5, 17.6, & 17.9)	
5/2	F	Factorial designs (2-way, b/w-sub. ANOVA)	M: 12	
5/5	M	Identifying main effects & interactions; how to make a bar graph in Excel	Watch my video of how to do a factorial ANOVA in SPSS (follow along in the yellow book).	**HW 11** (chi square and final exam practice problem)
5/7	W	Activity: Understanding interactions		
5/9	F	Final exam review	Read ALL SEVEN practice problems (on Bboard)	
5/12	M	Final exam review		**HW 12** (factorial ANOVA)

THE FINAL EXAM WILL BE HELD ON
SUNDAY, May 18 from 7-10pm in SCCT 3024, 3023 (Stats lab), or 3039 (larger Mac lab)