

SOCI 350: Statistics in Social Research

Instructor: W. Zachary Marshall

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Office Hours: by appointment

Office: Online

Class Hours: T,TH 11:35-12:55

Class Room: RPHYS 112

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1 Course Description

This course introduces students to the basics of statistics and data-driven analysis, with a focus on how they are used in social science research. At the end of this course, students should be able to use various numerical and graphical tools to describe a single variable, and to summarize the distribution of a variable using measures of central tendency and dispersion. In addition, they should be able to use correlation and basic regression to describe the relationship between a pair of variables.

The course also discusses the basics of statistical inference, i.e., a set of methods that draw conclusions about some broader population on the basis of sample data. It discusses the concepts underlying probability sampling, what a sampling distribution is, and the role of a sampling distribution in statistical inference. Students apply these concepts by learning how to test hypotheses about means, proportions, and pairs of means and proportions. They also learn how to calculate the confidence intervals associated with these tests.

1.1 Who is this course for?

- This is your first semester-long course on quantitative methods for data analysis. If you have already taken a full semester quantitative (or statistics) course, you are recommended not to enroll.
- You want to be able to better read and interpret quantitative research in the social sciences (even if you only intend to do qualitative work yourself).

- You are willing to spend time outside of the classroom to learn the course materials, as data analysis is a skill learned through actual practice.
- You want to be able to apply quantitative methods to your papers and future career.

1.2 Prerequisites

Some familiarity with elementary algebraic notation is assumed. This is an introductory course, so no previous experience in statistics is required. The course serves as a background for further statistics and data-analysis courses, helping to provide the intuition that can sometimes be lost amid the formulas.

2 Course Objectives

- Learn the basic tools of empirical research in the social sciences.
- Gain competency in the critical evaluation of empirical analyses of the social world you are confronted with in civic life.
- Obtain the tools both technical and intellectual to perform statistical analyses and critiques of your own.
- Gain real-world skills (such as coding or project-management skills) that will help you obtain jobs in careers of the future.

3 Instructional Method

Given the current challenges caused by Covid-19, this semester is unique in that course material will be delivered remotely (digitally). The course will use a mixture of techniques to deliver the material. This includes a mix of prerecorded lectures, Q and A sessions, and lab sessions. As the course evolves some of this may change, as different approaches appear to work better, or worse, than expected.

Lectures will be a mix of live and prerecorded. During these lectures we will cover basic conceptual tools that are the foundation of statistical analyses, these lectures should be available for the duration of the course to review through the MyCourses portal.

To accompany these lectures we will have Q and A sessions that occur on Zoom. During these sessions I (and possibly the TAs) will answer questions, and review lecture material. The goal is to have these sessions be flexible and student driven. This will allow lectures to be largely uninterrupted, so they are more accessible to review.

-These sessions may also be accompanied by problem sets that students can work through, and ask questions about. These problem sets will allow students to gain a better understanding of the course material (these problem sets will not be graded and are purely for the benefit of the students.)

The final method of instruction will be lab sessions (conferences). During these sections you will experience a mix of demonstrations/exercises/lab sessions that demonstrate how to use statistical software. For this course the primary software will be Stata. One of the TAs will walk you through a series of lab sessions that help you learn the software, and gain the necessary skills to complete your assignments for the course.

Required readings are assigned. These readings will largely be assigned from an introduction to statistics textbook. While lectures will be recorded, it is strongly recommended that students read the assigned chapters at least once before watching the lectures, as the lectures will assume students have read the assigned readings for the week.

3.1 Textbook

The textbook for this course will be:

Healey, J., Prus, S. G.. *STATISTICS : A TOOL FOR SOCIAL RESEARCH, 4th Canadian edition*. Toronto: Nelson Education.

If you find a cheaper version which is an older edition, that is also fine, but it your responsibility to be aware of any discrepancies. The textbook should be available in Le James bookstore, but cheaper options may exist.

Any additional readings will be provided on the MyCourses page and advertised before the respective class.

3.1.1 Other Resources (optional)

- David Pevalin and Karen Robson. 2009. *The Stata Survival Manual*. McGraw–Hill. This book provides guidance on how to use STATA, a statistical software widely used in the social sciences. **Note:** This book is optional, as both myself and the TAs will guide you towards learning Stata both in class and during office hours. Also, there are multiple online resources that are good substitutes of this book — feel free to ask us if interested.

3.2 Course Website

I will use **MyCourses** to post resources used in this class. These include the syllabus, the required readings, the databases we will use to perform statistical analyses, the demos run in class or labs, and lecture overheads. It is the students' responsibility to familiarize themselves, if they have not done so already, with MyCourses. The MyCourses website is located at <https://mycourses2.mcgill.ca/d2l/home>.

I will attempt to post the lecture overheads along with any recordings the morning of each class on the MyCourses page.

Again, please note that due to the online nature of the class this semester, I strongly encourage students to use the forums on MyCourses so that myself, TAs, or even other students can help answer your questions.

3.3 Preparing for Lectures

One way to prepare for class is to read the chapters ahead of time. After class, read the chapter again and do any assigned problems; do additional problems if you are having trouble. Then read the text of the chapter again to solidify what you learned. Additionally you can rewatch any recorded lectures. At the beginning of every class, I will make an effort to review briefly what we have covered in the previous class.

3.4 Computer Software

The **software** I will use in this class for demonstration/exercise sessions and that I also expect you to utilize to complete assignments is called Stata. This software should be available for all students to access remotely. The Faculty of Arts has purchased a license that should cover all students.

You can also purchase a temporary student license to use Stata on your own computers, however this should not be needed with the remote access provided by the Faculty of Arts.

However, if you still wish to purchase Stata for this class, Stata/IC will work. The price for a temporary Stata/IC license is \$48 for six months (<https://www.stata.com/news/student-pricing/>). If you think you might use Stata again in the future for your own research, however, I recommend opting for Stata/SE instead of Stata/IC.

3.5 Calculators

You will need a scientific calculator for some assignments. You may want to choose a calculator that also has some statistical functions (mean, standard deviation, and correlation) built in. You are responsible for learning how to use the statistical functions on your calculator. We do not provide specific instruction on how to use calculators.

4 Evaluation Policy

Quiz 1	10%	October 1st*
Assignment 1 (Individual)	15%	October 8th
Assignment 2 (Individual)	25%	November 12
Quiz 2	10%	November 17
Assignment 3/Final Project (Group)	40%	December 10th

*N.B. Dates are estimates, and may change before the start of classes.

Below is a description of the means of evaluation to be used in the course. Note that there will be **no final exam**. Your final grade will be based on the following components:

- **Two Quizzes, worth 10% each of your final grade (20% overall)**. These will be short quizzes that students will access through MyCourses. These quizzes will be up for 24 hours (starting during class time), so students will be able to complete them at their convenience. However, there will be a time limit once these quiz is opened, so ensure you have set aside enough time to complete the quiz (they will be shorter than a class session, so around 60 minutes).

These quizzes will not touch on the software (Stata) element of the course.

- **Three assignments, worth 15%, 25%, and 40% of your final grade (80% overall)**. I recommend starting working on the assignments as soon as they become available, which will give you the opportunity to follow the course as topics are being discussed, and also give you ample time to troubleshoot any possible issues with me and/or the Teaching Assistants. I will post assignments on MyCourses the day announced, and discuss them in class subsequently. Unless you meet an exception criterion, no late assignments are accepted. More details on the assignments below:

1. **Assignment 1, individual assignment, 15%**: In this assignment, you will be asked to perform sets of statistical analyses using Stata. You can discuss this assignment with other students in the class to further your understanding of the material, but you must write it up independently. To simply copy another student's assignment and turn it in is cheating. You will be expected to turn in both your answers to the assignment's questions and the Stata syntax you have employed to reach them (you will be taught on how to do this).
2. **Assignment 2, individual assignment, 25%**: Same type of assignment and same rules as for Assignment 1.
3. **Assignment 3, group assignment/project, 40%**: This is a different type of assignment that you are supposed to complete in groups of 3/4 students, where each team member will obtain the same grade — and only one write-up and code per group will be submitted. One of the goals of this course is to help you develop your skills as a producer of social research. As such, this assignment consists of a data-analysis project focused on descriptive statistics and graphical display of data, accompanied by a 5-page write-up — basically, a short academic paper on a research question of your own interest. We will provide you with a clean and simplified dataset that you can use for your project. You are also welcome to use your own dataset, but please share it with us beforehand so we can approve it and provide proper guidance. Details on this group project will be specified in class during the course. If you have troubles finding group members, reach out to me or the TAs. This group project will mark the

completion of this course, as there will be no final exam.

4.1 Re-Grading

Students who wish to contest a grade for an assignment or exam must do so in writing (by email, sent to me) providing the reasoning behind their challenge to the grade received within two weeks of the day on which the assignments are returned. The TA who graded the assignment will re-grade your assignment, and may **raise or lower the grade**. If you are still unsatisfied after the re-assessment, you can re-submit the assignment to me (original copy with TA comments), along with your justification. I will then re-evaluate the paper, but also reserve the right to **raise or lower the grade**.

4.2 Attendance

It is your responsibility to watch the lectures and attend any conferences or discussion sessions. As such, attendance won't be recorded class by class and no clickers will be used. Attendance will not count towards your final grade.

5 Communication Policy and Class Discussion List

This semester will present unique challenges for communication, I will be available to answer student emails, but I strongly encourage students to use MyCourses to ask questions, so myself and the TAs are not asked the same question multiple times. With that said, I will try to answer all emails within 24-48 hours (excluding weekends).

I will also be available by appointment, if students wish to discuss things one on one.

Again, I will also set up a discussion board on *MyCourses* as another means of communication. I encourage you to use this board to ask any questions you may have.

6 Make-Up Work Policy

No late assignments will be accepted without a proper documentation.

7 Academic Integrity

7.1 Course Policy on Computer Code

Just like writing a paper, copying other people's computer code constitutes plagiarism. Moreover, data programming is learned through trial and error. **Please do not under any circumstance copy another student's code**. If you are found to have done so, you may be referred to the appropriate Dean. The instructors reserve the right to use software to compare the code that has been written by different students.

7.2 McGill Policy

"McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures" (see <https://www.mcgill.ca/students/srr/honest/> for more information).

"L'université McGill attache une haute importance à l'honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l'étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le site www.mcgill.ca/students/srr/honest/)."

8 Other Policies

8.1 Language of Submission:

In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded." (approved by Senate on 21 January 2009 - see also the section in this document on Assignments and evaluation.)

Conformément à la Charte des droits de l'étudiant de l'Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté (sauf dans le cas des cours dont l'un des objets est la maîtrise d'une langue)."

8.2 Disabilities Policy

As the instructor of this course I endeavor to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me and the Office for Students with Disabilities, 514-398-6009.

8.3 Other McGill Resources and Support

If you need counseling and mental health support, do not hesitate to contact Counseling Services, where Psychologists, Social Workers, Counseling, Psychotherapies and Psychiatrists support the wellbeing and mental health of McGill students. You can reach the Student Wellness Hub at <https://www.mcgill.ca/wellness-hub/>.

If you have been impacted by sexual violence — sexual harassment or assault, gender-based or intimate partner violence, cyberviolence —, do not hesitate to contact the Office for Sexual Violence Response, Support and Education. You can reach the Office by mail at osvrse@mcgill.ca, in person at 550 Sherbrooke O. Suite 585 (West Tower elevators 1-11) and visit <https://www.mcgill.ca/osvrse/>.

8.4 End-of-Course Evaluations

End-of-course evaluations are one of the ways that McGill works towards maintaining and improving the quality of courses and the student's learning experience. You will be notified by e-mail when the evaluations are available. Please note that a minimum number of responses must be received for results to be available to students.

9 Class Schedule

Scheduling of topics for the course listed below and associated readings are subject to change at my discretion. Such changes, should they take place, will be announced in class and through MyCourses. Students are responsible for keeping abreast of any changes made.

Quiz 1	10%	October 1st
Assignment 1 (Individual)	15%	October 8th
Assignment 2 (Individual)	25%	November 12
Quiz 2	10%	November 17
Assignment 3/Final Project (Group)	40%	December 10th

The course will be broken up in to 3 sections, with an assignment following each section.

- Part a. Introduction to Data and Descriptive Statistics
-Weeks 1-4
- Part b. Inferential Statistics
-Weeks 5-10
- Part c. Measures of Association
-Weeks 11-13