Data Analysis I

Course Number: SW 388R6
Unique Number: 60680
Semester: Fall 2015
Time: Wednesday: 2:30-5:30pm
Room: SSW 1.214

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Canvas Website: https://utexas.instructure.com/courses/1151693

I. Course Description

This course is designed to introduce students to fundamental concepts and statistical procedures used in social work research. It also introduces students to computer applications for data analysis and helps them develop basic skills in data file construction and manipulation, data definition, and statistical analysis. The primary focus of the course is on developing a conceptual and mathematical understanding of statistics needed for advanced work in research design, model development, model fitting and estimation, hypothesis testing, multivariate techniques, and interpretation of data. The course will begin with basic statistical concepts such as central tendency, variability, sampling distributions, statistical significance, probability, normal curve, standardized scores, hypothesis testing, statistical inference, effect size, and statistical power. By the end of the semester, specific parametric and non-parametric statistical procedures will be introduced including t-tests, ANOVA (one-way, two-way), correlation and regression, chi-square and other non-parametric statistics.

II. Course Objectives

The stated mission of the doctoral program of the School of Social Work is "to prepare its graduates for successful academic careers as social work educators whose excellence as teachers and scholars will provide intellectual leadership for the profession." Pursuit of this mission will be the overall objective of this course. By the end of the semester students will:

1. Develop basic proficiency with computer data analysis including construction of data files, SPSS for data analysis, and development of an analysis plan;

2. Understand fundamental concepts of statistical analysis;

3. Develop basic skills necessary to organize, present, and interpret data;

4. Develop the ability to evaluate and interpret the results of statistical analysis;

5. Understand the relationship between research design and statistical methods.

II. Teaching Methods

It is my conviction that learning data analysis proposes a variety of challenges: using the computer to generate statistical output, memorizing a set of rules that may often appear counterintuitive, realizing that it is a complex process in which mistakes are likely, and, most important for PhD students, learning to communicate statistical results in clear and concise ways that make sense to general readers. These convictions guide my plan for the course.

The course design is based on a variation of the flipped classroom which emphasizes preparation prior to the class (reading text and preparing analysis) so that the actual class time can be used for feedback, clarification, and problem-solving.

The schedule contains a large number of small assignments, many of which (practice quizzes and practice analyses) only require an honest effort at completion to gain full credit. We will spend the majority of class time discussing your work on these practice analyses. The practice analyses provide the foundation for a major analysis paper that is divided into four installments. This paper and the presentation of it in class are designed to enhance your skills at presenting statistical finds clearly and concisely.

It is also my conviction that data analysis is an on-going learning process, and not something that is mastered in a single setting. It is my experience that every time I look at a topic that I have read or studied before, I see and learn new things. Repetition is an advantage.

To request help, send me an email. Usually you may anticipate a response within 24 hours. My email address is listed at the top of this syllabus. If I think your question is of general interest to the class, I may post it as an announcement unless you explicitly request that I do not post it.

If you need to meet with me individually, the best method for setting an appointment is via email. In data analysis, it often happens that you may need to show me something in the output, so start your work early so there is time to meet in person.

I have begun phased retirement (half-time) and plan to be on campus on Tuesdays and Wednesdays. I will check email on other days, so please do not hesitate to contact me.

IV. Required Text and Materials

Warner, Rebecca M. (2013) *Applied Statistics: From Bivariate Through Multivariate Techniques, Second Edition.* Sage Publications, Inc. ISBN-13: 978-1412991346

You should bring a laptop computer to the class to access CANVAS and test statistical procedures. If you do not have a laptop computer, you may borrow one from the Learning Resource Center in the School of Social Work (SSW 1.214A).

You will need SPSS for homework and class assignments. Your options for access to SPSS include:

- purchase the *SPSS Grad Pack* at the Campus Computer Store in the Flawn Academic Center (http://www.campuscomputer.com)
- license SPSS from Software Distribution & Sales (http://www.utexas.edu/its/products/spss/purchase.php)
- Check out a laptop with SPSS in the Learning Resource Center in the School of Social Work (SSW 1.214A)

The default data set for testing your research questions and hypotheses in written assignments is subsets of cases from the *General Social Survey*. A copy of the data set and codebook for all years are in the Data folder under the Files tab in Canvas. The files can also be downloaded from the National Opinion Research Center web site at http://www3.norc.org/GSS+Website/Download/SPSS+Format/ and http://www3.norc.org/GSS+Website/Documentation/. A smaller custom data set can be constructed and downloaded from the *SDA: Survey Documentation and Analysis* website hosted by the University of California, Berkeley at: http://sda.berkeley.edu/sdaweb/analysis/?dataset=gss12nw. Since this site provided both descriptions of variables and basic statistics, it can be very helpful for exploring the data set.

Each student has the option to substitute a data set available to them in their area of research interest for all written assignments. To qualify, the data set must contain at least 3 dichotomous variables, 3 categorical variables with 3 or more categories, and at least 5 quantitative variables (interval or scale), **about which defensible, meaningful research relationships can be formulated**. Students who are unsure whether their data set qualifies should discuss their concern with the instructor.

While it is likely that student research interests will overlap and they may wish to use the same data set, each student is expected to formulate unique research relationships for unique combinations of variables.

It is the responsibility of the student secure permission to use the data from its owner. Since this course does not expect or require any reporting of analyses or findings outside the course context, IRB approval is not be required for the work in this course. However, if the analysis of this data meets requirements for other courses or future activity involving publication and dissemination, an IRB application must be approved prior to the start of the analysis. Complete details about the requirements and procedures are at http://www.utexas.edu/research/rsc/humansubjects/class_project.html.

V. Course Requirements

Regular and timely class attendance is expected and students should come to class prepared to actively participate in the class. Course assignments include reading material from the textbook, practice quizzes, practice analyses, four major written assignments, and. Details and dues dates for all assignments can be found on the Canvas course website and the semester schedule below. The contribution of each type of assignment to the final grade are:

Practice quizzes	20%
Practice analyses	20%
Major analysis papers	40%
Major analysis presentations	20%

Final grades for this course will be assigned using the following scale.

94.0 and Above	A
90.0 to 93.999	A-
87.0 to 89.999	B+
84.0 to 86.999	B
80.0 to 83.999	B-
77.0 to 79.999	C+
74.0 to 76.999	C
70.0 to 73.999	C-
67.0 to 69.999	D+
64.0 to 66.999	D
60.0 to 63.999	D-
Below 60.0	F

Practice Quizzes

There will be a practice quiz at the beginning each class on the material assigned from the textbook for that class. The purpose of practice quizzes is to identify material in the text that requires further clarification and discussion. While the quizzes are graded for your individual feedback on content mastery, the quiz grades will not be used in computing your final grade. Instead, each student will receive 2 points toward the final grade for completing each of the ten quizzes, regardless of the quiz score based on correct/incorrect answers. The cumulative score for practice quizzes constitutes 20% of the final grade.

Make-up quizzes will not be provided. In the event that a student must miss a class when a quiz is due, they may obtain email permission from the instructor to complete the quiz in Canvas remotely.

Practice Analyses

To develop applied skills using the statistical techniques presented in the material assigned from the textbook for that class, each student will prepare a written practice analysis that satisfies the specifications presented in the description for each assignment on the Canvas web pages. Like practice quizzes, practice analyses will be given credit for timely completion of 2 points toward the final grade for each of the ten analyses submitted by the start of class, even if errors are found during the class discussion of the analysis.

Practice analyses should be brief (1 to 2 pages) and follow the template from the textbook for each analysis. It is expected that statistics will be formatted in APA style or the desired presentation style for disciplines other than Social Work. A clear statement of the research question or purpose of the analysis is required. For reference, the SPSS syntax and output should be appended at the end of the practice analysis.

Practice analyses should be submitted electronically in Canvas, using the link associated with the detailed description of the practice analysis in the Canvas Assignment pages.

Class Discussion

In each class, students will be randomly assigned to groups of 3 or 4 to present and critique the practice analyses of the group members. After these group discussions, each group will be asked to prioritize the presentations that present issues that merit sharing with the entire group, which will then discuss and present feedback to the presenter.

A different format will be followed for presentations of major analysis papers.

Major Analysis Papers

The major analysis paper for this course will be a complete and meaningful multiple regression analysis. The paper should be comparable to the data analysis and discussion in published research papers, including:
1. A brief description of the data set
2. A statement of the specific multiple regression research question(s), hypotheses, research aims or goals, etc. to be answered in this report
3. A brief description of the construct measured by each variable and the scaling of the variable.
4. Descriptive statistics for the sample used in the analysis.
5. A summary of the preliminary screening of variables.
6. A summary of the bivariate analysis supporting the multivariate research questions.
7. A narrative description of the statistical findings (significance and effect size), referencing supporting statistics or tables, including changes in relationships from bivariate analysis to multivariate analysis

8. A brief discussion of the practical implications of the findings (do not simply reiterate the findings)
9. Limitations including violation of assumptions, sample size limitations, measurement issues

The major analysis paper is due in four cumulative installments:

1. Multiple regression research question, logic behind the formulation of the research question, description of the data set, variables, sample (due September 9)
2. Preliminary data screening and bivariate support for multiple regression research question (due October 7)
3. Multiple regression with quantitative and categorical variables to answer research question (due November 11)
4. Multiple regression with multiple predictors and moderating variable(s) (due December 2)

The sections of the analysis that are due in each installment are listed in the Canvas assignment descriptions.

The expected length of the final installment is 15 to 20 pages, with previous installments scaled accordingly. Note that this paper does not include a literature review or theoretical grounding.

Each installment will be graded individually on 100% scale and annotated with feedback and suggestions. Papers are cumulative, and previously graded installments should be corrected as needed in the next installment. Students should not be surprised that previously graded installments may receive additional feedback or suggestions based on the context of the additional content.

Papers will be uploaded electronically in Canvas and graded online. SPSS syntax and annotated output should be submitted in Canvas in addition to the written paper.

Feedback and grading will be completed within two weeks to allow two weeks to complete and correct the next installment.

Major Analysis Paper Presentations

In the class period in which an installment of the major paper analysis is due, each student will do a brief presentation of their paper to the class. To allow enough time for each student to have an opportunity to present, presentations will be done in a modified version of the Pecha Kucha presentation format (20 slides, each for 20 seconds). While the Pecha Kucha format minimizes the use of text on slides, we will relax that expectation since that would be overly difficult for presenting research findings, though the creative use of graphics is encouraged.

A team of three respondents will be randomly selected to discuss and critique each presentation when it is complete.

VI. Class Policies

The University of Texas and the School of Social Work have policies that are required to be in all syllabi. A comprehensive listing of policies is provided below.

THE UNIVERSITY OF TEXAS HONOR CODE. The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.

PROFESSIONAL CONDUCT IN CLASS. The professor expects students to act as professionals in class. This means students should arrive on time for class, be prepared to participate in the class discussion, and show respect for one another's opinions. We will not, nor should we, always agree with one another. In this environment we should be exposed to diverse ideas and opinions, and sometime we will not agree with the ideas expressed by others. However, the professor does require that students engage one another with respect and professionalism.

CLASSROOM CIVILITY. A course brings together a group of diverse individuals with various backgrounds. Students are influenced and shaped by such factors as ethnicity, gender, sex, physical abilities, religious and political beliefs, national origins, and sexual orientations, among others. We expect to learn from each other in an atmosphere of positive engagement and mutual respect. Social Work deals with complex and controversial issues. These issues may be challenging and uncomfortable, and it would be impossible to offer a substantive classroom experience that did not include potentially difficult conversations relating to challenging issues.

UNANTICIPATED DISTRESS. Students may experience unexpected and/or distressing reactions to course readings, videos, conversations, and assignments. If so, students are encouraged to inform the instructor. The instructor can be responsive and supportive regarding students' participation in course assignments and activities, but students are responsible for communicating clearly what kind of support is desired. If counseling is needed, students can contact a service provider of their choosing, including the UT Counseling Center at 512-471-3515 or online at www.utexas.edu/student/cmhc/.

POLICY ON SOCIAL MEDIA AND PROFESSIONAL COMMUNICATION. Public social networks are not private. Even when open only to approved or invited members, users cannot be certain that privacy will exist among the general membership of sites. If social work students choose to participate in such forums, please assume that anything posted can be seen, read, and critiqued. What is said, posted, linked to, commented on, uploaded, subscribed to, etc., can be accessed and archived, posing potential harm to professional reputations and prospective careers.

Social work students who use social media (i.e. Facebook, Twitter, etc.) and other forms of electronic communication (i.e. blogs, etc.) must be mindful of how their

communication may be perceived by clients, colleagues, faculty, and others. Social work students are expected to make every effort to minimize material which could be considered inappropriate for a professional social worker in training. Because of this, social work students are advised to manage security settings at their most private levels and avoid posting information/photos or using any language that could jeopardize their professional image. Students are asked to consider the amount of personal information posted on these sites and are obliged to block any client access to involvement in the students' social networks. Client material should not be referred to in any form of electronic media, including *any* information that might lead to the identification of a client or compromise client confidentiality in *any* way. Additionally, students must critically evaluate any material that is posted regarding community agencies and professional relationships, as certain material could violate the standards set by the School of Social Work, the Texas Code of Conduct for Social Workers, and/or the NASW Code of Ethics.

Social work students should consider that they will be representing professional social work practice as well as the University of Texas at Austin School of Social Work program while in the classroom, the university community, and the broader area communities.

POLICY ON SCHOLASTIC DISHONESTY. Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. For further information, the student may refer to the Web Site of the Student Judicial Services, Office of the Dean of Students (http://deanofstudents.utexas.edu/sjs/).

USE OF CLASS MATERIALS. The materials used in this class, including, but not limited to, exams, quizzes, and homework assignments are copyright protected works. Any unauthorized copying of the class materials is a violation of federal law and may result in disciplinary actions being taken against the student. Additionally, the sharing of class materials without the specific, express approval of the instructor may be a violation of the University's Student Honor Code and an act of academic dishonesty, which could result in further disciplinary action. This includes, among other things, uploading class materials to websites for the purpose of sharing those materials with other current or future students.

DOCUMENTED DISABILITY STATEMENT. Any student who requires special accommodations must obtain a letter that documents the disability from the Services for Students with Disabilities area of the Division of Diversity and Community Engagement (471- 6259 voice or 471-4641 TTY for users who are deaf or hard of hearing). Present the letter to the professor at the beginning of the semester so that needed accommodations can be discussed. The student should remind the professor of any testing accommodations no later than five business days before an exam. For more information, visithttp://www.utexas.edu/diversity/ddce/ssd/.

RELIGIOUS HOLIDAYS. By UT Austin policy, students must notify the professor of a pending absence at least fourteen days prior to the date of observance of a religious holy day. If the student must miss a class, an examination, a work assignment, or a project in order to observe a religious holy day, the professor will give the student an opportunity to complete the missed work within a reasonable time after the absence.

USE OF E-MAIL FOR OFFICIAL CORRESPONDENCE TO STUDENTS. Email is recognized as an official mode of university correspondence; therefore, students are responsible for reading their email for university and course-related information and announcements. Students are responsible to keep the university informed about changes to their e-mail address. Students should check their e-mail regularly and frequently— daily, but at minimum twice a week—to stay current with university-related communications, some of which may be time- sensitive. Students can find UT Austin's policies and instructions for updating their e-mail address at http://www.utexas.edu/its/policies/emailnotify.php.

SAFETY. As part of professional social work education, students may have assignments that involve working in agency settings and/or the community. As such, these assignments may present some risks. Sound choices and caution may lower risks inherent to the profession. It is the student's responsibility to be aware of and adhere to policies and practices related to agency and/or community safety. Students should notify the professor regarding any safety concerns.

BEHAVIOR CONCERNS ADVICE LINE (BCAL). If students are worried about someone who is acting differently, they may use the Behavior Concerns Advice Line to discuss by phone their concerns about another individual's behavior. This service is provided through a partnership among the Office of the Dean of Students, the Counseling and Mental Health Center (CMHC), the Employee Assistance Program (EAP), and The University of Texas Police Department (UTPD). Call 512-232-5050 or visithttp://www.utexas.edu/safety/bcal.

EMERGENCY EVACUATION POLICY. Occupants of buildings on the UT Austin campus are required to evacuate and assemble outside when a fire alarm is activated or an announcement is made. Please be aware of the following policies regarding evacuation:

- Familiarize yourself with all exit doors of the classroom and the building. Remember that the nearest exit door may not be the one you used when you entered the building.
- If you require assistance to evacuate, inform the professor in writing during the first week of class.
- In the event of an evacuation, follow the professor's instructions.
- Do not re-enter a building unless you are given instructions by the Austin Fire Department, the UT Austin Police Department, or the Fire Prevention Services office.

VII. Semester Schedule

The following schedule is the weekly sequence of topics for the semester. The instructor reserves the right to make adjustments to the topic sequence if deemed necessary. Any changes will be made prior to the date of the class. The schedule of assignments and quizzes can also be found in the Canvas Calendar.

Class 1: August 26, 2015

1. Research Topics and Data Sets

Class 2: September 2, 2015

1. Practice Quiz: Chapter 4. Preliminary Data Screening

2. Practice Analysis: Preliminary data screening

Class 3: September 9, 2015

1. Major Analysis Paper 1: Research question, description of data set, variables, sample

2. Major Analysis Presentation 1: Research question, description of data set, variables, sample

Class 4: September 16, 2015

1. Practice Quiz: Chapter 5/6. Comparing Group Means Using the Independent Samples t Test/One-Way Between-Subjects Analysis of Variance

2. Practice Analysis: Comparing group means

Class 5: September 23, 2015

1. Practice Quiz: Chapter 7/8. Bivariate Pearson Correlation/Alternative Correlation Coefficients

2. Practice Analysis: Correlations

Class 6: September 30, 2015

1. Practice Quiz: Chapter 9. Bivariate Regression

2. Practice Analysis: Simple linear regression

Class 7: October 7, 2015

1. Major Analysis Paper 2: Bivariate support for multiple regression

2. Major Analysis Presentation 2: Bivariate support for multiple regression

Class 8: October 14, 2015

1. Practice Quiz: Chapter 10. Adding a Third Variable: Preliminary Exploratory Analyses

2. Practice Analysis: Adding a third variable

Class 9: October 21, 2015

1. Practice Quiz: Chapter 11. Multiple Regression With Two Predictor Variables

2. Practice Analysis: Multiple regression with two quantitative predictors

Class 10: October 28, 2015

1. Practice Quiz: Chapter 12. Dummy Predictor Variables in Multiple Regression

2. Practice Analysis: Multiple regression with categorical predictors

Class 11: November 4, 2015

1. Practice Quiz: Chapter 14. Multiple Regression With More Than Two Predictors

2. Practice Analysis: Multiple regression with quantitative and categorical predictors

Class 12: November 11, 2015

1. Major Analysis Paper 3: Multiple regression with quantitative and categorical variables

2. Major Analysis Presentation 3: Multiple regression with quantitative and categorical variables

Class 13: November 18, 2015

1. Practice Quiz: Chapter 13. Factorial Analysis of Variance

2. Practice Analysis: Factorial analysis of variance

Class 14: November 25, 2015

1. Practice Quiz: Chapter 15. Moderation: Tests for Interaction in Multiple Regression

2. Practice Analysis: Multiple regression with interaction

Class 15: December 2, 2015

1. Major Analysis Paper 4: Multiple regression with multiple predictors and moderating variable(s)

2. Major Analysis Presentation 4: Multiple regression with multiple predictors and moderating variable(s)