USC Suzanne Dworak-Peck School of Social Work

Social Work 760L

Introduction to Social Work Statistics

3 Units

Fall, 2019

Figures often beguile me, particularly when I have the arranging of them myself; in which case the remark attributed to Disraeli would often apply with justice and force: "There are three kinds of lies: lies, damned lies and statistics."
- *Mark Twain's Own Autobiography: The Chapters from the North American Review*

Instructor:	**Professor Michàlle Mor Barak, MSW, Ph.D.**
Lab Co-TA:	**Woo Jung (Amy) Lee, MA**
Lab Co-TA:	**Joshua Rusow, MSW, Ph.D. Candidate**
Course Day:	**Wednesday**
E-Mail:	**morbarak@usc.edu**
Course Time:	**8:00-10:50 (class) and 1:00-3:50 (lab)**
Office:	**MRF 341**
Course Location:	**MRF 204 (class) and SWC 118 (lab)**
Office Hours:	**By appointment**

Course Pre-requisites, Co-requisites, and/or Other Restrictions (including required prior knowledge or skills)

This is a doctoral level course. Registration by instructor's permission.

I. Catalogue Description

Foundation course covering univariate and bivariate descriptive and inferential statistics. Required lab covering basic computer skills and utilization of statistical software.

II. Course Description

Social Work Statistics 760 is the first of the three required statistical courses in the doctoral program. It covers the essential building blocks of statistical analysis,

including measures of central tendency, variation, introduction to probability theory as the foundation for inferential statistics, and univariate and bi-variate inferential statistics as well as some non-parametric statistics. In addition to the class instruction, the course has a lab component where you will learn Stata for Windows of Mac OS and acquire skills in computer-based data analysis.

III. COURSE OBJECTIVES

The overarching objectives of this course are
(a) to provide you with a conceptual understanding of basic univariate and bivariate statistical models frequently used in social science, social work, education, gerontology, psychology, management, and public health research;
(b) to provide you with the necessary operational skills needed for using quantitative methodologies to answer a variety of research questions;
(c) to give you an appreciation for the strengths as well as the limitations of quantitative analysis methodologies; and, (d) provide you with the foundation needed to master more advanced multivariate statistical techniques in your subsequent statistics courses.

IV. COURSE FORMAT / INSTRUCTIONAL METHODS

This course assumes that students already possess (a) knowledge and understanding of basic mathematical and algebraic principles; (b) a solid grounding in the concepts and logic of research methodology; and(c) a basic understanding of elementary statistical analysis.

Students are expected to read the assigned readings for each class and be prepared to discuss them. The reading assignments will be important preparation for students' comprehension and participation in class. Class/lab attendance is essential and students need to discuss anticipated absence with the instructors and notify them of any emergency related absence. Homework assignments need to be turned in on a weekly basis.

V. STUDENT LEARNING OUTCOME OBJECTIVES

Upon completion of this course, you should have gained:

1. A conceptual understanding of the logic and assumptions underlying statistical inference. We will focus on the application of a number of specific statistical methods to a variety of research questions. This will enable you to:
    a. Critically assess the use of statistical methods in empirically-based research; and
    b. Actively participate in the design, implementation, analysis and interpretation of on-going research.
2. Basic computational skills which will contribute to an operational

understanding of these statistical models;

3. An understanding of the interrelationships between methodological issues and statistical analysis;
4. Proficiency in accessing and utilizing the USC computer system and the Stata statistical package; and
5. Competence in reading and interpreting computer print-outs and reporting the results of statistical analyses.

VI. Course Assignments, Due Dates & Grading

Assignment	Due Date	% of Final Grade
Lab assignments and quizzes	Weekly/bi-weekly	5%
1st mid-term (in-class)	Session 7	25%
2nd mid-term (in-class)	Session 11	30%
Final exam (take home)	By Wednesday, Dec. 11th, noon during exam week	40%
	Total	100%

Each of the assignments is described below.

Homework

A combination of conceptual and computational problems from the text book will be assigned weekly.

Article summary

Each student will select an article from a peer-reviewed journal that demonstrates a specific application of a statistical method covered in class and will provide a one page summary that includes the following: (1) a complete reference for the article; (2) research question/hypothesis relevant to the specific application of the statistical method; (3) How the method was applied (short description with a page reference for the location of any text or tables in the article); and a brief critical evaluation of the application (was the statistical test applied correctly). Please be prepared to make a brief presentation (no more than 10 minutes) in class, scheduled by the instructor.

Lab Assignments and quizzes

The lab instructors will assign practice exercises and quizzes to help you master the application of the Stata software to statistical analysis (specific details are in the lab syllabus).

Mid-terms

The mid-term exams will include a combination of computational and conceptual problems. The format is open books and open notes (no internet access).

Final Take-home Exam

This exam will provide you with the opportunity to demonstrate the combined learning from the class and the lab. You will receive a data base from a real-life research project and will be asked to answer specific research questions by selecting and applying relevant statistical methods from those covered in class. The exam will also include a few conceptual questions.

VII. REQUIRED AND SUPPLEMENTARY INSTRUCTIONAL MATERIALS & RESOURCES

Required Textbooks

Agresti, A. & Finlay, B. 2009. Statistical Methods for the Social Sciences, Fourth Edition. Pearson Prentice Hall.

A thorough yet accessible text covering the spectrum of statistical methodology that will be covered in this class from descriptive statistics, through probability, estimation and inferential statistics to ANOVA, and statistical modeling.

Kachigan, S.K. 1986. Statistical Analysis: An Interdisciplinary Introduction to Univariate and Multivariate Methods. Radius Press.

This is a classic and excellent book that emphasizes the theory and conceptual framework for the statistical applications taught in class and complements the first text.

Recommended Textbooks

Siegel, S. & Castellan, J.N. 1988. Non-parametric Statistics for the Behavioral Sciences. New York: McGraw -Hill.

An excellent overview of non-parametric statistics, a classic book that is often cited in published articles because of its systematic and detailed approach to the subject (we will only use a few sections from the book).

Additional texts will be required for the computer lab portion of this course.

NOTE: Additional required and recommended readings may be assigned by the instructor throughout the course.

VIII. ATTENDANCE POLICY

Students are expected to attend every class and to remain in class for the duration of the session. Failure to attend class or arriving late may impact your ability to achieve course objectives which could affect your course grade. Students are expected to notify the instructor by email (morbarak@usc.edu) of any anticipated absence or reason for tardiness.

University of Southern California policy permits students to be excused from class, without penalty, for the observance of religious holy days. This policy also covers scheduled final examinations which conflict with students' observance of a holy day. Students must make arrangements *in advance* to complete class work which will be missed, or to reschedule an examination, due to holy days observance.

Please refer to SCampus and to the USC School of Social Work Student Handbook for additional information on attendance policies.

IX. STATEMENT ON ACADEMIC INTEGRITY

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. *SCampus,* the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: http://www.usc.edu/dept/publications/SCAMPUS/gov/. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: http://www.usc.edu/student-affairs/SJACS/.

Additionally, it should be noted that violations of academic integrity are not only violations of USC principles and policies, but also violations of the values of the social work profession.

X. STATEMENT FOR STUDENTS WITH DISABILITIES

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. *Please be sure the letter is delivered to the instructor as early in the semester as possible*. DSP is located in STU 301 and is open from 8:30 a.m. to 5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

XI. EMERGENCY RESPONSE INFORMATION

To receive information, call main number (213)740-2711, press #2. "For recorded announcements, events, emergency communications or critical incident information."

To leave a message, call (213) 740-8311
For additional university information, please call (213) 740-9233
Or visit university website: http://emergency.usc.edu

If it becomes necessary to evacuate the building, please go to the following locations carefully and using stairwells only. Never use elevators in an emergency evacuation.

University Park Campus		Academic Centers	
City Center	Front of Building (12th & Olive)	**Orange County**	Faculty Parking Lot
MRF	Lot B	**San Diego**	Building Parking Lot
SWC	Lot B	**Skirball**	Front of Building
VKC	McCarthy Quad		
WPH	McCarthy Quad		

Do not re-enter the building until given the "all clear" by emergency personnel.

XII. Statement about Incompletes

The Grade of Incomplete (IN) can be assigned only if there is work not completed because of a documented illness or some other emergency occurring after the 12th week of the semester. Students must NOT assume that the instructor will agree to the grade of IN. Removal of the grade of IN must be instituted by the student and agreed to be the instructor and reported on the official "Incomplete Completion Form."

XIII. Policy on Late or Make-Up Work

Please discuss with the instructor any unforeseen needs or emergencies that could affect your compliance with course expectations. If no arrangements have been made ahead of time late submission of work could affect your grade.

XIV. Policy on Changes to the Syllabus and/or Course Requirements

The instructor may make some minor modifications to the class schedule in order to facilitate the learning process of the class.

XV. Complaints

Please let the instructor know of any concerns you have regarding the course content or delivery. If you are unable to reach a satisfactory outcome, feel free to discuss your issue with the director of the doctoral program and/or the Associate Dean for Student Affairs for further guidance.

Course Schedule: Detailed Description

Session 1 — **August 28th, 2019**

Topics

- INTRODUCTION: COURSE OBJECTIVES, ASSIGNMENTS, GRADING
  - INTRODUCTION TO STATISTICS, THE ROLE OF STATISTICS IN THE RESEARCH PROCESS: SAMPLING, MEASURMENT AND DESIGNS
    - VARIABLES AND LEVELS OF MEASUREMENT

Required Readings

- Kachigan, chapters 1 and 2.
- Agresti & Finlay, chapters 1, 2 (skip section 2.4 -- the different types of sampling methods will be covered in your research class so we will only briefly cover the topic in class as it is relevant to understanding the logic of statistical inference)

- UNIVARIATE DESCRIPTIVE STATISTICS – FREQUENCY DISTRIBUTION AND MEASURES OF CENTRAL TENDENCY

Required Readings

- Kachigan, chapters 3, 4.
- Agresti & Finlay, chapter 3 (sections 3.1, 3.2)

Recommended Readings

Articles demonstrating the use of the methodology:

- Holosko, M.J., 2009. What types of designs are we using in social work research and evaluation? Research on social work practice, 1-10. (Demonstrates the use of descriptive statistics).
- Brown M.J.,& Groscup, J. 2008. Perceptions of same-sex domestic violence among crisis center staff. Journal of family violence, 24:87-93. (Descriptive statistics)
- Mor Barak, M.E., Levin, A., Nissly, J.A. & Lane, C.L. 2006 Why do they leave? Modeling child welfare workers' turnover intentions, Children and Youth Services Review 28: 548-577. (Descriptive statistics in the context of testing a more advanced statistical model)

Session 2 — **September 4th, 2019**

Topics

- UNIVARIATE DESCRIPTIVE STATISTICS –
  - FREQUENCY DISTRIBUTION AND MEASURES OF CENTRAL TENDENCY (cont.)
  - MEASURES OF DISPERSION AND VARIATION

Required Readings

- Kachigan, chapter 5
- Agresti & Finlay, chapter 3 (section 3.3)

Recommended Readings

Articles demonstrating the use of the methodology:

- Alas, R., & Rees, C.J., 2006. Work-related attitudes, values and radical change in post-socialist contexts: a comparative study. Journal of Business Ethics, 68: 181-189. (Demonstrates the use of means and standard deviations. Also demonstrates the use of K-S, please see sessions 10-11).
- Porter, L.E. & Alison, L.J. 2007. Examining group rape: A descriptive analysis of offender and victim behavior. European Journal of Criminology, 3(3): 357-381. (Basic frequencies and other descriptive statistics).
- Stark, R.B. & Cohen, B. E. 2007. Promoting positive student attitudes toward social work research using course web sites. Journal of Teaching in Social Work 27(1/2): 181-198. (Graphic representation of descriptive statistics).

Session 3 — September 11th, 2019

Topics

- INFERENTIAL STATISTICS –
  - INTRODUCTION TO PROBABLITY

Required Readings

- Kachigan, chapter 6
- Agresti & Finlay, chapter 4 (4.1)

Session 4 — September 18th, 2019

Topics

- SAMPLING DISTRIBUTIONS

Required Readings

- Kachigan, chapter 7
- Agresti & Finlay, chapter 4

Session 5 — September 25th, 2019

Topics

- PARAMETER ESTIMATION

Required Readings

- Kachigan, chapter 8
- Agresti & Finlay, chapter 5

Session 6 — October 2nd, 2019

Topics

- **FIRST MIDTERM**

Session 7 — October 9th, 2019

- Holiday No Class

Session 8 — October 16th, 2019

Topics

- HYPOTHESES TESTING

Required Readings

- Kachigan, chapter 9
- Agresti & Finlay, chapters 5, 6, 7 (EXCEPT 7.7)

Recommended Readings

Articles demonstrating the use of the methodology:

- Buckley, T., et. al 2009. Prospective study of early bereavement on psychological and behavioural cardiac risk factors. Internal medicine journal, 39:370-378. (independent t-test, paired t-test, Mann-Whitney, Wilcoxon, Chi-square – see also sessions 10-11).

- Rapaport, Judd, Schettler, et a., 2002.A descriptive analysis of minor depression, American Journal of Psychiatry, 159: 637-643. (Descriptive statistics, t-test, chi-square and Wilcoxon.

Session 9 — October 23rd, 2019

Topics

- HYPOTHESES TESTING (continued)

Session 10 — October 30th, 2019

Topics

- NON-PARAMETRIC STATISTICAL TESTS

Required Readings

- Seigel, chapters 3,4
- Agresti & Finlay, chapter 7 (section 7.7)

- ORDINAL SCALES: NON-PARAMETRIC TEST
  - Runs Test; Mann-Whitney U Test

Required Readings

- Kachigan, chapters 19
- Siegel, chapters 6.4, 6.6, 5.3

- ORDINAL SCALES TWO SAMPLE NON-PARAMETRIC TEST

Required Readings

  - Kolmogorov-Smirnoff Test; Wilcoxon Signed Ranks Test

- Kachigan, chapters 19
- Siegel, chapters 6.4, 6.6, 5.3

Required Readings

- Siegel, chapter 8.3

Recommended Readings

Articles:

- Alas, R., & Rees, C.J., 2006. Work-related attitudes, values and radical change in post-socialist contexts: a comparative study. Journal of Business Ethics, 68: 181-189. (Demonstrates the use of Kolmogorov-Smirnov test – see also session 3 above).

- Buckley, T., et. al 2009. Prospective study of early bereavement on psychological and behavioural cardiac risk factors. Internal medicine journal, 39:370-378. (independent t-test, paired t-test, Mann-Whitney, Wilcoxon, Chi-square – see also sessions 8-9 above).

Session 11 — November 6th, 2019

Topics

- **SECOND MIDTERM**

Session 12 — November 13th, 2019

Topics

- NOMINAL SCALES: CONTINGENCY TABLES

Required Readings

- Kachigan, chapter 13
- Siegel, chapters 6.1, 6.2, 8.1, 5.1
- Agresti & Finlay, chapter 8 (8.1, 8.2)

Recommended Readings

- Hawkins, S.C., et. Al., 2007. Paid work increases and state benefit claims decrease after bariatric surgery, Obesity surgery, 17:434-437. (Wilcoxon and Chi-Square)

Session 13 — November 20th, 2019

Topics

- INTRODUCTION TO ANOVA

Required Readings

- Kachigan, chapter 12
- Agresti & Finlay, chapter 12

Recommended Readings

- Plummer, C.A., et. Al., 2009. Volunteerism among social work students during hurricanes Katrina and Rita. Journal of social service research, 34(3):55-71. (Demonstrates the use of ANOVA)
- Mor Barak, M.E. & Levin, A. 2002. Outside the corporate mainstream and excluded from the work community: a study of diversity, job satisfaction and well-being. Journal of Community, Work and Family, 5(2):133-157. (t-test and ANOVA in the context of testing a conceptual framework).

Session 14 — Thanksgiving – University Holiday — November 27th, 2019

- Holiday, no class

Session 15 — December 4th, 2019

Topics

- ANOVA (CONT.) AND COURSE WRAP-UP

FINAL EXAMINATION — December 11th, 2019

Final Exam due Wednesday Dec. 11th at noon.

Have a great winter break!