



School of Social Work
Challenging Minds, Leading Change, Transforming Lives

SW 9100 Social Statistics and Data Analysis (3 credits) Fall 2013	
Section 001 (#13826), Mondays 05:30PM - 08:15PM 0111 Old Main Instructor: Dr. Faith P. Hopp	Office: 315 Thompson Home Email (Preferred way to reach me): faithopp@wayne.edu Office Hours: Mondays (1:00-3:00pm) or by appointment

I. COURSE DOMAIN AND BOUNDARIES

This is a required course in the research methods sequence for WSU doctoral students. At the end of this course, students will be able to apply univariate and bivariate statistics and analysis of variance to analyze data obtained from social work practice settings. Students will learn to formulate research questions and hypotheses, choose the appropriate statistical analyses, conduct these analyses, using SPSS, interpret their findings, and communicate their results clearly and effectively to both scholarly and social work practice audiences. Prerequisite: Master's-level statistics in social, behavioral or health sciences.

II. KNOWLEDGE AND SKILL OBJECTIVES

By the end of this course, the student should be able to:

1. choose and apply appropriate descriptive and bivariate statistical techniques to address research questions and hypotheses;
2. use SPSS for univariate and bivariate data analyses;
3. interpret findings;
4. communicate results clearly and effectively, using APA format;
5. understand statistical assumptions and how to detect and address violations; and
6. appreciate current controversies related to topics addressed in this course.

III. PERFORMANCE CRITERIA

Three papers, regular homework, and two tests are required. The papers are "take-home" assignments. These papers require students to perform data analyses using SPSS, present the using APA format, and to interpret the results. Secondary datasets will be provided for the assignments by the instructor. However, students may obtain permission from the instructor to analyze their own data.

Papers are expected to be written independently, although students are encouraged to work together prior to writing. If you want extra help with assignments and understanding the material, please see the instructor. Before you consider using a tutor, please speak with me—I can provide some helpful suggestions.

Homework assignments will primarily consist of problem sets from the required texts. **Students will be expected to do one class demonstration per term based on the homework assignment (details to be discussed in class).** The two tests cover essential statistical concepts that students will need to continue their study of statistics and data analysis.

<u>Assignment (due date)</u>	<u>% of Grade</u>
Paper #1:Descriptive statistics/Data Screening (10/7)	20%
Test #1 (10/21)	20%
Test #2 (11/18)	20%
Paper #2:T-test and ANOVA (11/25)	20%
Paper #3:Contingency table analysis (χ^2) and correlation (12/13)*	20%
TOTAL	100%

*this is the Friday after the last class on 12/9

Grading Criteria:

Papers will be graded according to the following scale:

- A: Excellent, exceeds expectations; superior performance;
- B: Good, meets all normal expectations; consistent grasp of content and competency in meeting course objectives; or
- C: Fair, meets some expectations but misses others; acceptable but barely adequate; uneven grasp of course content.

95.0-100 A	90.0-94.9 A-	87.0-89.9 B+	83-86.9 B	80.0-82.9 B-
77.0-79.9 C+	73.0-76.9 C	72.9 or below F		

GRADING SCALE:

IV. REQUIRED TEXTS/REQUIRED MATERIALS

* Jaccard, J. & Becker, M. (2002). *Statistics for the behavioral sciences* (4th ed.). Belmont, CA: Wadworth/Thompson Learning.

**Mertler, C.A. & Vannatta, R.A. (2013, 5th edition). *Advanced and multivariate statistical methods* (5th ed.) Glendale, CA: Pyrczak Publishing

Meyers, L., Gamst, G. & Guarino, A.J. (2013, 2nd Edition). *Applied Multivariate Research: Design And Interpretation*. Thousand Oaks, CA: Sage Publications.

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SPSS (Statistical Package for the Social Sciences) is available to students for FREE at the WSU Software clearinghouse:

<https://commerce.wayne.edu/clearinghouse/customer/account/login/>

For further assistance with installing SPSS, contact C&IT support at (313) 577-4778 or at

helpdesk@wayne.edu

* Note that this is NOT the most recent edition.

**This book will also be used for SW 9300; you may be able to find the 4th edition as a used copy; this is acceptable as long as you make sure you have the correct page references.

V. RECOMMENDED TEXTS

American Psychological Association (2009). *Publication manual of the American Psychological Association* (6th ed.). Washington, DC: Author.

Elliott, A.C.; Woodward, W.A. 2007. *Statistical Analysis: Quick Reference Guidebook, With SPSS Examples*. SAGE Publications. \$45.95

Morgan, S., Reichert, T., & Harrison, T. (2002). *From numbers to words: Reporting statistical results for the social sciences*. Boston, MA: Allyn and Bacon.

Munro, B.H. 2005. *Statistical Methods for Health Care Research*. 5th edition. Lippincott Williams & Wilkins. \$58.45 (Amazon.com).

Nicol, A., & Pexman, P. (1999). *Presenting your findings: A practical guide for creating tables*. Washington, DC: American Psychological Association.

VI. COURSE OUTLINE

Session 1: September 9

Introduction and Overview

- Course overview
- Key concepts/terminology
- Measurement
- Notation
- Introduction to SPSS and the lab

Readings: Jaccard and Becker, Ch. 1

Session 2: September 16

Descriptive Statistics: Univariate Distributions

- Frequency and probability distributions
- Modes of presentation

Descriptive Statistics: Central Tendency and Dispersion

- Mean, median, mode
- Range
- Sum of squares

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Variance and standard deviation
Skewness and kurtosis

Readings: Jaccard and Becker, Ch. 2 & 3

Session 3: September 23

Lab Session for entire class

Descriptive Statistics Using SPSS
Pre-Analysis Data screening

Readings: Meyers, Gamst, & Guarino, 2006, Chapters 3A and 3B: Data Screening; Data Screening using SPSS

Session 4: September 30

Descriptive Statistics: Relative Standing

Percentiles
Standard scores
Normal distributions

Pearson Correlation & Regression: Descriptive Aspects

The Linear model
Pearson Correlation Coefficient
Correlation & Causation
Interpreting the magnitude of a correlation coefficient
Regression

Probability

Probability of a simple event
Conditional probability
Joint probability
Adding probabilities
Relationship among probabilities

Readings: Jaccard and Becker, Ch. 4, 5 & 6

Session 5: October 7

Paper #1 due: Descriptive statistics/Data Screening

Introduction to Inferential Statistics

Inferential Statistics: Hypothesis Testing

Null versus alternative hypotheses
Type I and Type II errors
Significance
Effect size
Confounding variables

Correlation & Regression: Inferential Aspects

Linear model
Strength of Relationship
Confidence Intervals
Regression

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Presenting Results

Readings: Jaccard and Becker, Ch. 9 & 14

Session 6: October 14

Estimation and Sampling Distributions

Samples and populations
Sampling distributions
Standard errors

Readings: Jaccard and Becker, Ch. 7

Session 7: October 21

Test 1 (closed book; necessary formulas will be provided): Levels of Measurement, hypothesis testing, correlation (J&B chapters 1-5 + lectures 1-4)

Inferential Statistics: T-tests

Inferences about a single mean
Independent groups t-test
Correlated groups t-test

Readings: Jaccard and Becker, Chs. 8, 10 & 11

Session 8: October 28

Entire Class Session in Lab: T-Tests

Readings: Meyers, Gamst, & Guarino, 2006, Chapters 8A and 8B: Univariate Comparisons of Means; Univariate comparisons of means using SPSS

Session 9: November 4

Entire Class Session in Lab: ANOVA

Inferential Statistics: ANOVA

Factors
Between-subjects and within-subjects designs
Variance decomposition F test
Multiple comparison procedures
Two way ANOVA

Jaccard and Becker, Ch. 12 & 13

Session 10: November 11

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Review session:

**Bring your questions related to
Test #2**

Article Discussion:

Cohen, J. (1990). Things I have learned (so far). *American Psychologist*, 45, 1304- 1312.

Prentice, D. & Miller, D. (1992). When small effects are impressive. *Psychological Bulletin* 112, 160-164.

White, L. (2005) Writes of passage: Writing an empirical journal article. *Journal of Marriage and Family* 67: 791-798.

Shlonsky, A., D'Andrade, A., & Brookhart, M.A. (2002). JSWE submission suggestions for statistical methods. *Journal of Social Work Education* 38, 5-13.

Session 11: November 18

(Lab will be available)

**Test #2 (open book):Probability,
Fundamentals of Inferential
Statistics, T-tests & ANOVA**

Following test:

**Discussion/Questions on
Papers #2 & 3**

Session 12: November 25

Paper #2 due: T-tests and ANOVA

Inferential Statistics: Contingency Table Analysis

Chi-square

Other measures of association

Readings: Jaccard and Becker, Chapters 15 & 16

Session 13: December 2

Inferential Statistics: Bivariate Regression

Regression and prediction

Linear versus curvilinear models

Standardized and unstandardized coefficients

Readings: Jaccard and Becker, Chs. 5 & 14

Meyers, Gamst, & Guarino, 2006, Chapters 4A and 4B: Bivariate
Correlation and Simple linear regression

Course Evaluation (SET)

Session 14: December 9

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Note: Paper #3 due on Friday, December 13:

Contingency table analysis (χ^2) and correlation

Inferential Statistics: Advanced ANOVA

Main effects and interactions (Factorial designs) Analysis of covariance (ANCOVA)

Multivariate analysis of variance (MANOVA)

Repeated-measures analysis of variance (RM-ANOVA)

Readings: Jaccard and Becker, Ch. 17

SELECTED BIBLIOGRAPHY

The following sources are resources that you may find helpful as you prepare your assignments.

Austin, D. M. (1999). A report on progress in the development of research resources in social work. *Research on Social Work Practice*, 9(6), 673-707.

Berger, P. & Luckmann, T. (1967). *The social construction of reality: A treatise in the sociology of knowledge*. Garden City, NY: Anchor Books.

Berger, R. (1997). The common logic of research and practice in social work. *Social Work and Social Sciences Review*, 7(2), 112-121.

Bloom, M, Fisher, J. & Orme, J. (1996). *Evaluating practice: Guidelines for the accountable professional* (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.

Campbell, D. T. and Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research*. Chicago: Rand McNally.

Chavkin, N. F. (1993). *The use of research in social work practice*. Westport, CT: Praeger.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. New York: Academic Press.

DePoy, E., Hartman, A. & Haslett, D. (1999). Critical action research: A model for social work knowing. *Social Work*, 44(6), 560-568.

DeVellis, R.F. (1991). *Scale development: Theory and applications*. Newbury Park, CA: Sage Publications.

Fook, J. (Ed.). (1996). *The reflective researcher*. St. Leonards, Australia: Allen & Unwin.

Fowler, F. J. (1995). *Improving survey questions: Design and evaluation*. Thousand Oaks, CA: Sage Publications.

Fuller, R. & Petch. A. (1995). *Practitioner research*. Buckingham: Open University Press.

Gibbs, A. (2001). The changing nature and context of social work research. *British Journal of Social Work*, 31(5), 687-704.

Gibbs, L. E. (1991). *Scientific reasoning for social workers: Bridging the gap between*

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research and practice. New York: Merrill.

Gil, E. F., & Bob, S. (1999). Culturally competent research: An ethical perspective. *Clinical Psychology Review*, 19(1), 45-55.

Gillespie, D. F. & Gilsson, C. Eds. (1992). *Quantitative methods in social work*. Binghamton, NY: Haworth.

Gilsson, C., & Gillespie, D. F. (1993). Toward the development of quantitative methods in social work research. *Journal of Social Service Research*, 16(1/2), 1-10.

Grinnell, R. M. (1999). *Social work research and evaluation*. Itasca: F.E. Peacock.

Guba, E. G., Ed. (1990). *The paradigm dialog*. Newbury Park, CA: Sage Publications.

Hudson, W.W., & Nurius, P.S., Eds. (1994). *Controversial issues in social work research*. Boston: Allyn and Bacon.

Jaccard, J. & Becker, M. (2002). *Statistics for the behavioral sciences* (4th ed.). Belmont CA: Wadsworth/Thomson Learning.

Kerlinger, F.N. & Lee, H.B. (2000). *Foundations of behavioral research* (4th ed.). New York: Holt, Reinhart and Winston.

Kimmel, A. J. (1988). *Ethics and values in applied social research*. Newbury Park, CA: Sage.

Kirk, S.A. & Reid, W. J. (2002). *Science and social work*. New York: Columbia University Press.

Koeske, G.F. (1994). Some recommendations for improving measurement validation in social work research. *Journal of Social Service Research*, 18(3/4), 43-73.

Mertler, C.A. & Vannatta, R.A. (2005). *Advanced and Multivariate Statistical Methods: Practical Application and Interpretation* (3rd ed.). Los Angeles: Pyrczak Publishing.

Miller, D.C. & Salkind, N. J. (2002). *Handbook of research design and social measurement* (6th ed.). Newbury Park, CA: Sage Publications.

Orcher, L.T. (2005). *Conducting research: Social and behavioral science methods*. Glendale, CA: Pyrczak Publishing.

Patten, M.L. (2002). *Understanding research methods* (3rd ed.). Los Angeles: Pyrczak Publishing.

Patten, M.L. (2005). *Proposing empirical research*. (3rd ed.). Los Angeles: Pyrczak Publishing.

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Reinharz, S. (1992). *Feminist methods in social research*. New York: Oxford University Press.

Rosenthal, R., Cooper, H., & Hedges, L.V. (1994). *The handbook of research synthesis*.

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New York: Russell Sage Foundation.

Rubin, A. (2007). *Statistics for evidence-based practice and evaluation*. Belmont, CA: Thompson Higher Education.

Schalock, R. L. (1995). *Outcome-based evaluation*. New York: Plenum.

Weinbach, R. W. & Grinnell, R.M. (1997). *Statistics for social work*. New York, NY: Longman.

Weinbach, R.W. (2005). *Evaluating social work services and programs*. Boston: Pearson Education, Inc.

Westerfelt, A., & Dietz, T.J. (2005). *Planning and conducting agency-based research* (3rd ed.). Boston: Pearson Education, Inc.