INTRODUCTION TO STATISTICS AND DATA ANALYSIS

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COURSE REQUIREMENTS:

1. There will be 7-8 homework assignments. These will involve computer analysis using the Statistical Package for the Social Sciences (SPSS). This work will constitute thirty percent (30%) of your course grade. It is ESSENTIAL that this work is done ON TIME, which I define as 3:00 pm on the date due, unless otherwise noted. Late papers will lose 1 point (of a possible 10) of the grade per calendar day.

2. Each student will prepare two 9-12 page papers based on independent analysis of data on a topic chosen by the student. A more detailed description of this requirement will be given later.

   Paper 1 is due Friday, October 17 at 3:00 PM. (30% of course grade)
   Paper 2 is due Friday, December 12 at 3:00 PM. (40% of course grade)

Late papers will be penalized 3 (or 4) points (of a possible 30 or 40) per calendar day.

NOTE: For both Papers 1 and 2, except for catastrophic medical or grievous personal reasons, I will NOT grant extensions.

COURSE TEXTS:


Recommended Supplementary Reading: Marija Norusis: SPSS 19.0 STATISTICAL PROCEDURES COMPANION (or version 18.0 or 20.0, etc.). Or Norusis: SPSS 19.0 GUIDE TO DATA ANALYSIS (or version 18.0 or 20.0, etc.).


For those who plan to take SOCY7703 in the spring: Note that the Polit text and Norusis’s Companion will be used extensively in that course.

Several other books may be of use for reference purposes and are on reserve in O’Neill:

Nancy Leech et al., SPSS FOR INTERMEDIATE STATISTICS (3rd ed.) HA32.L444
GENERAL SOCIAL SURVEYS: CUMULATIVE CODEBOOK HN29.N33
Sidney Siegel, NONPARAMETRIC STATISTICS H61 S.57
Rebecca M. Warner, APPLIED STATISTICS (Sage: 2008) HA31.35 W37
RECOMMENDED: You might want to download the "SPSS Brief Guide 22.0.pdf" from this web page:


The “Brief Guide 22” can be used as a reference manual later in the course. Chs. 4-6 are worth browsing. NOTE: The 'Brief Guide" has 98 pages, so you may not want to print it.

The BC Application Server is called apps.bc.edu. It allows members of the BC community to access and use certain licensed applications, including SPSS 22, from any computer with a network connection. Here is some information on apps.bc.edu:

http://www.bc.edu/offices/help/teaching/app_server.html

In order to use apps.bc.edu you must first install Citrix Receiver on your MAC or PC. Staff from BC’s Information Technology Help Desk and Research Services departments will attend our class on Sept. 4 in order to address questions regarding the installation and use of apps.bc.edu and the related cloud based data storage area.

AppsStorage.bc.edu

You may read about AppsStorage.bc.edu here:
http://www.bc.edu/content/bc/offices/help/teaching/app_server/apps-files/saving.html

Those of you who plan to go on to SC703 next semester might also want to download (but not print – it’s 2000+ pages!) the SPSS 22 “Command Syntax Reference Manual.” Individual command syntax references are also available from the SPSS Help pull down menu when running SPSS from apps.bc.edu. However, if you do wish to download the entire manual, it is available at:
TOPICS AND READINGS

Dates are subject to change
Additional topics may be added as time allows

1. INTRODUCTION; USING SPSS (Week of Sept. 2)

Objectives: to learn some of the basics of SPSS programming; to submit an SPSS run.
Reading: Handouts as assigned or distributed; Polit, Chs. 1-2; Linneman: Chs. 1 & 2.
Warner, Chs. 1-2, and 4; Healey, Chs. 1-2; Norusis Guide 14.0, Cs. 1-2; Norusis Companion 16.0, Chs. 1-2 and 7

2. DESCRIPTIVE STATISTICS (Sep. 9, 16, 23)

Objectives: to be able to use, and interpret the output of, the FREQUENCIES and DESCRIPTIVE procedures in SPSS.
Topics Considered: level of measurement (nominal, ordinal, interval, ratio), histograms, measures of central tendency, measures of dispersion, percentiles, Z scores, mean, median, mode, variance, standard deviation, standard error, skewness, range, the normal distribution. Other topics as deemed appropriate.
Reading:
Polit, Chs. 3 and 5; Linneman: Ch. 3.
Healey, Ch. 3-4; Warner, Chs. 1, 2, and 4; Norusis Guide Ch. 5;
Norusis Companion, Chs 3-6 and 10; Levin & Fox (L&F), Chs. 1-6 (esp. 5 and 6); Malec, Chs. 1-4.

3. DIFFERENCES IN MEANS (Sept. 30, Oct. 7, 14)

Objectives: to be able to use, and interpret the output of, the T-TEST and ONEWAY procedures.
Topics Considered: probability; sampling distribution, samples vs populations, simple random samples vs other types of samples; the research hypothesis, the null hypothesis, directional vs nondirectional research hypotheses; alpha and the critical region; Type I vs Type II error; statistical significance vs substantive significance, sampling distribution of the mean, confidence intervals, one-tailed vs two-tailed tests; the t-test; equal (or pooled) variance estimate vs unequal (or separate) variance estimate; simple one-way analysis of variance. Other topics as deemed appropriate.
Reading:
Polit, Chs. 6-7; Linneman, Ch. 5 & 6.
Warner, Chs. 3, 5 and 6; Norusis Guide Cha. 10-14;
Norusis Companion, Chs. 7-9; L&F, Chs. 10 and 11; Malec, Ch. 7
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4. CROSSTABULATION & MEASURES OF ASSOCIATION (Oct. 21, 28, Nov. 4),

Objectives: to be able to use, and interpret the output of, the CROSSTABS procedure, to understand the distinction between a measure of association and a test of significance, to understand the concept of statistical inference and the uses and misuses of tests of significance.

Topics Considered: measures of association (nominal measures, Chi-Square, PRE measures, ordinal measures; the elaboration paradigm (explanation, interpretation, specification, spurious relationships, suppresser variables); main and interaction effects in crosstabs tables. Other topics as deemed appropriate.

Reading:
- Polit, Ch. 8 (to p. 178 only); Linneman: Ch. 4.
- Warner, Ch. 8 and section 10.12; Norusis Guide Ch. 17 to p. 377), 18 (pp. 400-402) and19; Norusis Companion, Ch. 10 (also 447-451); Malec, Ch. 8, 9 (pp. 137-154), 11 (pp. 184-193); L&F, Chs. 7-9, 12, and 13 (pp. 330-354)

5. PEARSON CORRELATION COEFFICIENT, PARTIAL CORRELATION, SCATTERPLOTS, AND SIMPLE REGRESSION (Nov. 11. 18. 25)

Nov. 24 is Thanksgiving – no class.

Objectives: to be able to use, and interpret the output of, the CORRELATIONS and PARTIAL CORR procedures.

Topics Considered: the Pearson correlation coefficient, R-square, slope, intercept, the equation for a regression line, predicted value vs actual value, standard error of estimate, use and interpretation of scattergrams, partial correlation, higher order partials. Other topics as deemed appropriate.

Reading:
- Polit, Ch. 9; Linneman: Ch. 7 & 8.
- Warner, Ch. 7, 9 and 10.1-10.11, also skim Ch. 11; Norusis Guide Ch. 20; Norusis Companion Chs. 11-12 and pp. 237-254; L&F Ch. 13 (to p. 330); Malec, Ch. 9 (pp. 154-158), 10, 11 (pp. 189-192)
6. **NONPARAMETRIC TESTS** (Dec. 2)

**Objectives:** to be able to use, and interpret the output of, the **NONPAR TESTS** and **NONPAR CORR** procedures

**Topics Considered:**
- Spearman’s rank correlation coefficient, Mann-Whitney test (and others as time allows).
- Other topics as deemed appropriate.

**Reading:** Polit, Ch. 8 (pp. 178-194).

**Paper 2 is due Friday, December 12 at 3:00 PM** (40% of course grade). Late papers will be penalized 4 points (of a possible 40) per calendar day.

**ACADEMIC INTEGRITY**

It is your obligation to be fully aware of the Boston College policies on academic honesty. ANY violation may subject the offender to severe penalty, including course failure. If you are not familiar with the Boston College policy on academic honesty, see:

http://www.bc.edu/offices/stserv/academic/resources/policy.html#integrity

**OFFICE HOURS**

My office hours are Wednesday from 2:00-4:00, Tuesday & Thursday from 10-11, and by appointment. (But on 9/17 I will not have office hours)