UIC

MHPE 494
Data Analysis

Course Syllabus and Notes

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MHPE 494 – Data Analysis

Summer 2002   2 credits

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The goal of this one-week intensive course is to introduce students to a variety of techniques for analyzing behavioral science or educational data and to provide hands-on experience performing these analyses with statistical software. Students will gain a sense of the breadth of techniques available for understanding and exploring relationships in data.

Course objectives: Upon completion of the course, the student will be able to:

1. Organize a data set and examine data for discrepancies and errors in entry

2. Explore the relationships between variables in a data set and identify interesting patterns

3. Select appropriate statistical methods for testing hypotheses in a set of data, and perform the analyses

4. Interpret and report the results of statistical analyses

5. Recognize one's own limitations in data analysis

Textbooks:

DC Howell. *Statistical Methods for Psychology (5th Ed.)* Belmont, CA: Wadsworth Publishing Company, 1997.

> This is an excellent and fairly comprehensive practical statistics book that's suitable for any behavioral scientist or educator. It covers a number of important topics that many books leave out, including exploratory data analysis, logistic regression and log-linear analysis, and nonparametric tests, and does so in a clear and useful fashion.

SPSS 9.0 Guide to Data Analysis. SPSS Publications.

> A very handy guide to making SPSS for Windows do what you want with your data. Of particular use are the chapters that focus on data file manipulation and other non-statistical SPSS features.

Software:

SPSS Inc. *SPSS for Windows* (ideally, version 10 or higher)*.*

> SPSS has become the standard windows-based statistical software package for most psychological and educational applications. It's available in versions for MS Windows, Mac, and other operating systems. It includes a large array of statistical procedures and provides a convenient windows-based interface to them. However, SPSS is not the only good statistical program. SAS, notably, has some of the best documentation of any statistical package, and is preferred by some.

(Optional) Microsoft Corporation. *Microsoft Excel* (ideally, version 97 or higher).

> Although Excel isn't really a statistical package, it provides a more convenient interface for initial data entry and some exploratory analyses, and SPSS can read Excel files, which later versions of Excel can save their worksheets as.

Schedule:

The course includes assigned readings, short lecture sessions, and hands-on analysis of data sets during class time. Students will work in pairs for data analysis exercises, and will present their analyses and results to the class.

The readings provide additional information on topics covered in the lectures, as well as a reference for conducting analyses on SPSS. The Howell readings should be considered mandatory for each session; the Foster readings are optional, and designed to be consulted during hands-on analysis if required.

	Mornings (9:00 - noon)	**Afternoons (1:00 - 4:00)**
Monday	Readings: Howell: ch 2 SPSS: ch 3, 4, 6, app B Introduction Data entry and checking Exploratory data analysis	Readings: Howell: ch 4, 7 SPSS: ch 11-14 Hypothesis testing Testing means
Tuesday	Readings: Howell: ch 11, skim 12, 13.3-13.6, skim 14 SPSS: ch 15 Factorial designs	Readings: Howell: ch 18.6-18.10, 6 SPSS: ch 16-17 Nonparametric tests Chi-square
Wednesday	Readings: Howell: ch 9 SPSS: ch 18-19 Relationships between variables Correlation and linear regression Reliability measures	Readings: Howell: ch 15 SPSS: ch 22 Multiple regression Stepwise and hierarchical regression Logistic regression
Thursday	Readings: none Factor analysis Conceptual introduction to other techniques	Practicum
Friday	Practicum post-mortem	

Assignments:

Much of the course consists of hands-on data analysis in pairs followed by presentation of results to the class. The final assignment is a practicum: given a documented data set, and a series of questions and hypotheses about the data, pairs will test them using the techniques taught in the course.

There is no paper due for this course.

Grading:

The course grade will depend on:

Class participation   80%
Practicum   20%

Students will be graded individually on class participation. For the practicum, each student in the pair will receive the same number of points.