MSc Criminology and Criminal Justice

Quantitative Analysis for Social Scientists: Introduction to Statistics and SPSS

Hilary 2016

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Summary of Course:

This course is designed for students who want to learn quantitative analysis techniques for use in criminological contexts. Students will learn both basic statistical concepts and how to use SPSS, a statistical package widely used in the social sciences. The course will be taught using a version of the Crime Survey for England and Wales (CSEW) dataset. By the end of the course, students will be able to understand and critically assess papers containing quantitative data, use appropriate statistical methods, and present their analyses effectively in their dissertations.

Course Objectives:

The course will enable students to:

- Understand and interpret quantitative criminological research.
- Conduct analysis of existing datasets using SPSS.
- Present findings in an appropriate manner.

Target Audience:

- Students who are new to statistics and statistical analysis.
- Students who are planning on doing secondary data analysis for their dissertations.
- Students who are considering applying for jobs where a basic knowledge of statistics and statistical computer packages is required.

Students:

- Compulsory for MSc (Research Methods) students
- Optional for MSc students

Duration and term:

- Duration: 8 classes over 8 weeks
- Term: Hilary Term.

Organization of each class (4 hours):

- 120 minutes of statistical concepts, delivered as a lecture in most cases.
- 120 minutes of working in SPSS. Students will complete set assignments in class. These will be structured around the type of analysis under consideration, not the use of the computer programme *per se*. The intention is not to 'teach' SPSS in a formal sense – rather, students will be introduced to the relevant aspects of the package as the course progresses, meaning that they will learn to use it in an organic fashion.

- Note there will be a 10 minute break at the midpoint of each class – each 2 hour session will be treated as a discrete 'unit'.

Assessment:

- The course will be examined by an assessed essay of 2,500 to 3,000 words (inclusive of footnotes, but excluding bibliography and appendices). This will involve producing analyses containing descriptive and inferential statistics.
- Students will also be asked to complete a short assignment each week, to be handed to the lecturer at an agreed later time. These will be marked on an informal pass/fail basis and returned to them the following week.

Pre-requisites:

- There are no formal pre-requisites for this course but it will assume that students are familiar with research design and methodology (i.e. students should have completed 'Research Design and Data Collection').
- No prior knowledge of statistics is required, and only extremely basic mathematic skills will be assumed (or required).

Reading

This course has one recommended course text:

- Agresti, A. and Finlay, B. (2009). *Statistical Methods for the Social Sciences (Fourth edition)*. Pearson. (AF)

Students may also find the following text book more 'user-friendly':

- Field, A. (2009). *Discovering Statistics Using SPSS (Third edition)*. London: Sage.

In addition, students may wish to consult the LSE Methodology Department's excellent set of on-line tutorials, which cover much of the same material as the current course: http://www.lse.ac.uk/methodology/tutorials/SPSS/home.aspx

Additional references to relevant scholarly articles, books and other sources are provided below. Students will be encouraged to read these papers, although doing so will not be a formal course requirement. Note that these papers are *not* given as examples of best practice, merely of cases where specific techniques have been used.

Course Outline

As noted each class will be a mixture of lecture and practical session using SPSS. The lectures will cover both conceptual issues and practical examples: the emphasis will be on why and how to perform specific analyses. In the practical sessions students will work at their own pace through a class assignment. This will be provided in written form, along with instructions on how to conduct the necessary analyses.

WEEK 1

Unit 1: Introduction

Lecture: What is statistical data? Why analyse data? Available sources of data.
Practical: Retrieving, entering and saving data; data management.

Unit 2: Descriptive statistics

Lecture: Univariate and bivariate statistics; distributions; presentation of data.
Practical: Descriptive statistics (frequencies, percentages, crosstabulations); charts and figures (histograms, bar charts, line charts, box-plots).

Readings:

- AF 1, 2.1 and 3.
- Bowling, B. and Philips, C. (2007). Disproportionate and discriminatory: Reviewing the evidence on police stop and search. *The Modern Law Review* 70(6): 936-961.
- ONS (2015). *Crime in England and Wales, Year Ending March 2015.* Available at: http://www.ons.gov.uk/ons/rel/crime-stats/crime-statistics/year-ending-march-2015/stb-crime-march-2015.html.
- Jannson, K. (2007). *British Crime Survey: Measuring crime for 25 years.* Available at: http://webarchive.nationalarchives.gov.uk/20110218135832/http://rds.homeoffice.gov.uk/rds/bcs1.html

WEEK 2

Unit 3: Introduction to statistical inference

Lecture: Samples and populations; sampling distributions and probability distributions; statistical inference.
Practical: Random sampling and calculations of sample means.

Unit 4: Introduction to statistical inference (continued)

Lecture: Hypothesis testing; t-tests.
Practical: Two-sample tests for group means; confidence intervals for point estimates

Readings:

- AF 2, 4, 6, 7.
- Chaplin, R., Flatley, J. and Smith, K. (eds) (2011). *Crime in England and Wales 2010/2011: Findings from the British Crime Survey and police recorded crime (First Edition)*. London: Home Office. Chapter 5.

WEEK 3

Unit 5: Associations between categorical variables: contingency tables

Lecture: Two-way contingency tables; Chi-square tests.
Practical: Generating and interpreting contingency tables; chi-square tests.

Unit 6: Associations between categorical variables: contingency tables continued

Lecture: Two- and three-way contingency tables; Chi-square tests; the concept of statistical control
Practical: Generating and interpreting contingency tables; chi-square tests.

Readings:

- AF 8 and 10.
- Hoare, J. and Moon, D. (2010). *Drug Misuse Declared: Findings from the 2009/10 British Crime Survey.* Home Office Statistical Bulletin 13/10.
- Roberts, J.V. and Hough, M. (2011). Custody or community? Exploring the boundaries of public punitiveness in England and Wales. *Criminology and Criminal Justice* 11: 181-197.

WEEK 4

Unit 7: Associations between continuous variables: correlation

Lecture: Scatterplots and the line of best fit; Pearson's correlation coefficient
Practical: Generating scatterplots and interpreting correlation coefficients.

Unit 8: Associations between continuous variables: simple linear regression

Lecture: Simple linear regression.
Practical: Estimating and interpreting simple linear regression models.

Readings:

- AF 9.
- Wilkinson, R. and Pickett, K. (2009) *The Spirit Level*. London: Allen Lane. Chapters 10 and 11.

WEEK 5

Unit 9: Scale Construction

Lecture: The concept of scales; validity and reliability; Cronbach's alpha
Practical: Constructing and validating scales.

Unit 10: Multiple linear regression

Lecture: Revisiting the concept of statistical control. Estimating and interpreting multiple linear regression models
Practical: Estimating and interpreting multiple linear regression models.

Readings (for weeks 5 and 6):

- AF 11.
- King, A. and Maruna, S. (2009). Is a conservative just a liberal who has been mugged? Exploring the origins of punitive views. *Punishment and Society* 11: 147-169.
- Offer, A., Pechey, R. and Ulijascek, S. (2010). Obesity under affluence varies by welfare regimes: The effect of fast food, insecurity, and inequality. *University of Oxford Discussion Papers in Economic and Social History*, Number 82, July 2010. Available at: http://www.economics.ox.ac.uk/materials/papers/4401/offer82.pdf
- Tankebe, J. (2010) Public Confidence in the Police: Testing the Effects of Experience of Police Corruption in Ghana. *British Journal of Criminology* 50: 296 – 319.

WEEK 6

Unit 11: Multiple linear regression (continued)

Lecture: Further interpretation of linear regression models; dummy variables.
Practical: Generating dummy variables; estimating and interpreting multiple linear regression models including dummy variables as predictors

Unit 12: Multiple linear regression (continued)

Lecture: Further interpretation of linear regression models; model diagnostics.
Practical: Estimating and interpreting multiple linear regression models.

WEEK 7

Unit 13: Binary logistic regression

Lecture: Regression models for binary response variables.
Practical: Estimating and interpreting binary logistic regression models.

Unit 14: Binary logistic regression (continued)

Lecture: Model selection
Practical: Estimating and interpreting binary logistic regression models.

Readings:

- AF 15.1.
- Jackson, J. and Gray, E. (2010) Functional Fear and Public Insecurities About Crime. *British Journal of Criminology* 50(1): 1-22.
- Tarling, R. and Morris, K. (2010). Reporting crime to the police. *British Journal of Criminology* 50(3): 474-490.

WEEK 8

Revision session