

# Intermediate Social Statistics

## Hilary 2009

### Course Outline

**Course providers:** Ray Duch ([raymond.duch@nuffield.ox.ac.uk](mailto:raymond.duch@nuffield.ox.ac.uk))

**Course Website:** [www.raymond Duch.com/hilary2009/ISS](http://www.raymond Duch.com/hilary2009/ISS)

#### **Lecture Topics**

Introduction to Maximum Likelihood Estimation (MLE)  
MLE and the Linear Model  
Binary logit and probit  
Binary Logit and Probit Models: Extensions and Applications  
Ordered Logit/Probit  
Multinomial logit/probit  
Event Count Models  
Duration Models

#### **Course structure**

There will be a two hour lecture on Tuesday (first two weeks on Wednesday) 2-4 pm in Lecture Theatre in the Manor Road Building every week during Hilary term. These lectures are accompanied by four classes where the practical aspects of the models discussed in the lecture will be taken up. Classes will be run by Michelle Jackson and David Armstrong on Thursdays of weeks 3, 5, 6 and 8 in the Manor Road Building IT room from 4-6pm.

#### **Topics covered each week**

<b>Week</b>	<b>Topic</b>
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1	Introduction to MLE Long, J. Scott 1997, Chapters 1-2
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2	MLE and the Linear Model Long, J. Scott 1997, Chapters 1-2
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3	<i>Binary logit and probit models</i> This week reviews regression models for binary dependent variables such as yes/no or voted/abstained.
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Long, J. Scott. 1997 Regression Models for Categorical and Limited Dependent Variables. Chapter 3 and 4.

4 Binary logit and probit models extensions and applications

5 *Ordered logit/ probit*

These models are for ordered categorical variables, e.g. survey questions where there are ordered categories such as strongly agree, agree, neither agree nor disagree, disagree, strongly disagree.

6 Long, J. Scott. 1997 Regression Models for Categorical and Limited Dependent Variables. Chapter 5 and 6

*Multinomial logit/ probit*

These models are for categorical variables that are not ordered, e.g. survey questions where there are categories such as vote Labour, Conservative or LibDem.

7 Long, J. Scott. 1997 Regression Models for Categorical and Limited Dependent Variables. Chapter 5 and 6

*Event count models*

Models for count data are used for relatively infrequent events, with say an average between 0 and 7 (e.g. the number of presidential vetoes in a year).

Long, J. Scott. 1997 Regression Models for Categorical and Limited Dependent Variables. Chapter 8; and TBA

8 *Duration Models*

Models for count data are used for relatively infrequent events, with say an average between 0 and 7 (e.g. the number of presidential vetoes in a year).

Long, J. Scott. 1997 Regression Models for Categorical and Limited Dependent Variables. Chapter 8; and TBA

### **Assessment**

For those who are taking this course for credit, your grade will be based on four weekly assignments. Your homework assignments should be handed into your class instructors at the date indicated on each of the weekly assignments. In the homework, you will be expected to demonstrate skill in the application of, and ability to evaluate critically, the models and methods discussed in both the lectures and classes. There will also be a take home exam that will be due in Week 9.

### **Principal Texts:**

J Scott Long. 1997. *Regression Models for Categorical and Limited Dependent Variables*. Sage.

J Scott Long and Jeremy Freese. 2006. *Regression Models for Categorical Dependent Variables Using Stata*. Stata Press.

David J. Bartholomew, Fiona Steele, Irini Moustaki, and Jane I. Galbraith. *The Analysis and Interpretation of Multivariate Data for Social Scientists*. Chapman & Hall/CRC, 2002.

David A. Freedman. *Statistical Models; Theory and Practice*. Cambridge University Press, 2005.

David J. Bartholomew, Fiona Steele, Irini Moustaki, and Jane I. Galbraith. *The Analysis and Interpretation of Multivariate Data for Social Scientists*. Chapman & Hall/CRC, 2002.

### **Other Readings**

John Aldrich. 1984. *LPM, Logit, and Probit*. Sage.

Vani Kant Borooah. 2001. *Logit and Probit: Ordered and Multinomial Models*. Sage.

Dayton, Mitchell C. 1999. *Latent Class Scaling Analysis*. Sage.

John Fox. 1991. *Regression Diagnostics*. Sage.

John Fox. 1997. *Applied Regression Analysis, Linear Models, and Related Methods*. Sage.

Thomas H. Wonnacott and Ronald J. Wonnacott. 1990. *Introductory Statistics*. Wiley.