Longitudinal Data Analysis for Social Science Researchers

Re-introducing Survey Data: References / Resources

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This file is also available from http://www.longitudinal.stir.ac.uk/ .

Longitudinal research and data analysis training

These resources are produced to help social scientists conduct quantitative longitudinal research using large-scale survey datasets. It has been our experience that an intrinsic part of such training necessarily concerns recapping and revising some introductory issues in quantitative data analysis. The references below are intended to provide background materials which relate to a range of applications which are commonly applied in quantitative social science research. More specific guidance on longitudinal quantitative research is found in the corresponding file 'Quantitative Longitudinal Research: References / Resources'.

Re-introducing quantitative data analysis in the social sciences: reading recommendations

The references listed below are broadly divided by topics. Below we have highlighted a variety of texts which we have found useful for social science training – but it is worth bearing in mind that are many further resources and texts available.

i) Quantitative data analysis as a research programme

The texts below are examples of reflexive writing on the place of quantitative research in the social sciences. Of course you may well be in the position that you've moved beyond such reflection and want to learn the methods regardless of what others think of them! However it can still be helpful to know a little background on the contemporary issues. More extended cogitations can be found in literatures concerned with the philosophy of social research.

Bechhofer, F. "Quantitative Research in British Sociology", *Sociology* 30(5)583-91, 1996. (*Discussion of research methods in the discipline from a professional perspective).*

Blaikie, N. *Analyzing Quantitative Data: From Description to Explanation.* London: Sage; 2003. ISBN: 0-7619-6758-3. (*See introduction and chpt 1 for critical appraisals of the nature of quantitative research).*

Bryman, A. *Social Research Methods, 2nd Edition*. 2004 (1st edition 2001). Oxford, Oxford University Press. ISBN: 0-19-926446-5. (*See chapters 1-3; part 2 more generally describes the research components of quantitative analysis).*

Buckingham, A. and Saunders, P. *The Survey Methods Workbook.* Cambridge: Polity Press, 2004. ISBN: 0-7456-2244-5. *(Part I on research design is an excellent review of debates about the value of quantitative analysis for survey research).*

Davies, R.B. "Statistical modelling for survey analysis". *Journal of the Market Research Society*. 1994. 35(3)235-47. *(Succinct introduction to the thinking behind statistical models, plus development of arguments favouring longitudinal quantitative survey data).*

Goldthorpe, J. H. *On Sociology : Numbers, narratives, and the integration of research and theory*. Oxford: Oxford University Press, 2000 (2nd Edition in 2 volumes - 2007). ISBN: 0-1982-9572-3. (*A thoughtful but not introductory text on research methodologies, written by one of the leading figures in empirical UK survey research. Second edition is a two volume set).*

Maxim, P.S. Quantitative Research Methods in the Social Sciences. Oxford: Oxford University Press. 1999. ISBN: 0-19-511465-5. (*This is quite an advanced text, it combines critical discussion of the nature of data analysis methods with discussion of the more complex statistical methods that can be used to address them).*

Payne, G., Williams, M. and Chamberlain, S. "Methodological Pluralism in British Sociology" *Sociology*. 38(1)153-163. 2004. *(Argues that the use of and skills in quantitative methodologies in British sociology should be more widespread. There are two published replies to this article in Sociology 39(1)).*

Payne, G. and Payne, J. *Key Concepts in Social Research.* London: Sage, 2004. ISBN: 0-7619-6543-2. *(Introductory comments on quantitative along with other types of research method).*

Penn, R.D. *Social Change and Economic Life in Britain*. Bologna: Homeless Book, 2006. ISBN: 1-86220-162-5. *(Introduction includes a useful expression of the value of empirical data in studying social change).*

Punch, K. F. *Introduction to Social Research: Quantitative and qualitative approaches.* London: Sage; 1998. ISBN: 0-7619-5812-6. (*See chapters 5, 6 and 7.2nd edition published March 2005).*

Raftery, A.E. "Statistics in Sociology: A Selective Review. *Sociological Methodology*. 2001. 31:1-46. *(Outlines a series of traditions in data analysis in the social sciences. A brief version of the same article is available in Journal of American Statistical Association,2000, 95(450):654-61).*

Ragin, C.C. *Constructing Social Research.* Thousand Oaks, Ca. : Pine Forge Press, 1994. ISBN: 0-8039-9021-9. (*See chapter 6 for a succinct review of the nature of quantitative social research methods).*

Seale, C. (ed) *Social Research Methods: A reader.* London: Routledge, 2004. ISBN: 0-415-30084-3. *(See chapters 18, 19, 20, 22, 23. The selections in this book are somewhat biased – most critiques are based on the perceived quantitative research practices of many decades ago).*

Steuer, M.D. *The Scientific Study of Society.* Boston: Kluwer Academic, 2003. ISBN: 1-4020-7321-6. *(A wide review of social research practices which engages with issues of quantitative research).*

UK Data Forum. *The National Strategy for Data Resources for Research in the Social Sciences*. Warwick: University of Warwick, 2007. http://www2.warwick.ac.uk/fac/soc/nds/ (Accessed 18 June 2007).

Wheaton, B. "When methods make a difference", *Current Sociology*, 51(5)543-71, 2003. *(Methodological reflections on sociology's uptake of new methodological techniques, concentrating on quantitative methods and longitudinal analyses).*

ii) Reviews of widely used quantitative methods

There are a great many texts which describe the details of quantitative methods of analysis for the purposes of social science research. Their normal formula is to steadily work through a selection of the most commonly used statistical methods. Some of the better examples are listed below. * indicates 'readable', with limited statistical and software notation; † indicates inclusion of helpful guides to software; ‡ indicates less readable, but a more complete list of quantitative methods.

†Antonius, R. *Interpreting Quantitative Data with SPSS*. London: Sage, 2003. ISBN: 0-7619-7399-0. (*Extensive SPSS instructions and good review of techniques, though unfortunately all SPSS examples are via windows interface)*

*†Black, T.R. *Doing Quantitative Research in the Social Sciences: An integrated approach to research design, measurement and statistics.* London: Sage, 1999. ISBN: 0-7619-5353-1. (*One unusual feature of this book is that is gives advice on how to conduct statistical summaries in Microsoft Excel - more widely available than SPSS).*

*†Blaikie, N. *Analyzing Quantitative Data: From Description to Explanation.* London: Sage; 2003. ISBN: 0-7619-6758-3. (*A readable but also fairly comprehensive guide to data analysis methods for social scientists. It has strong opening sections on the uses and misuses of quantitative analysis methods).*

‡Blalock, H. M. *Social Statistics : Revised Second Edition.* Singapore: McGraw-Hill; 1979. ISBN: 0-0700-5752-4. (*This is a 'classic' student textbook for data analysts, widely used since its first editions in the sixties. Remains a good source for a thorough overview of significant analysis methods).*

†Boslaugh, S. *An Intermediate Guide to SPSS Programming: Using Syntax for Data Management.* London: Sage, 2005. ISBN: 0761931856. *(Whilst this text is oriented primarily to data management, it also serves as a helpful introductory guide to the operation of SPSS for data analysis – see chpts 1-7 and 13).*

*Bryman, A. *Social Research Methods, 2nd Edition*. Oxford: Oxford University Press, 2004 (1st edition 2001). ISBN: 0-19-926446-5. (*Chpts 11 and 12 are short but wide ranging descriptions of forms of quantitative analysis).*

†Bryman, A. and Cramer, D. *Quantitative Data Analysis with SPSS 12 and 13*. London: Routledge; 2005. ISBN: 0415340802. (*A popular long-running textbook. An advantage of the 1994 copy is that it has SPSS syntax instructions, whilst later editions move towards windows guides).*

*†Buckingham, A. and Saunders, P. *The Survey Methods Workbook.* Cambridge: Polity Press, 2004. ISBN: 0-7456-2244-5. (*See part 3 for methods of data analysis. This book also has a very useful series of online appendices with extended details on particular techniques of analysis).*

‡de Vaus, D. *Surveys in Social Research, 5th Edition.* London: Routledge; 2002. ISBN: 0-4152-6857-5. (*A best-selling guidebook to survey methods, but also includes a long section on data analysis. An attractive feature of this book is that the 2002 edition includes many links to helpful webpages – although on the other hand, quite a few of them are already broken!).*

*†Foster, J.J. Data Analysis using SPSS for Windows: A Beginner's Guide, *2nd Edition.* London: Sage, 2001. ISBN: 0-7619-6952-8. (*Although primarily an undergraduate text targeted at Psychology students, this book has considerable strengths in that it includes instructions on using SPSS syntax, and it is one of only a few books to cover many more advanced issues in data management and analysis, such as matching files and multivariate methods of analysis. Book includes a disc with some example files in it).*

Foster, J.J., Barkus, E. and Yavorsky, C. *Understanding and Using Advanced Statistics*. London: Sage, 2005. *(Chapters cover a selection of multivariate analyses techniques with mention of SPSS implementations.)*

‡Frankfort-Nachmias, C. and Nachmias, D. *Research Methods in the Social Sciences, 5th Edition*. London: Edward Arnold, 1996. ISBN: 0-3406-6226-3. (*Wide coverage of quantitative techniques as well as introductory guide to quantitative methods. Some SPSS instructions also).*

*†Gayle, V. 'Quantitative Data Analysis', in Burton, D. (ed) *Research Training for Social Scientists: a handbook for postgraduate researchers.* London: Sage; 2000. ISBN: 0-7619-6351-0. (*Very accessible, good range of coverage, plus many SPSS examples).*

Hardy, M. and Bryman, A. (eds) *Handbook of Data Analysis.* Sage, 2004. ISBN: 0-7619-6652-8. *(After the first 2 more introductory chapters, most of the chapters in this edited collection are relatively advanced in nature. They do however provide a helpful overview of 'state of the art' applications in quantitative social science research).*

†Kinnear, P.R. and Gray, C.D. *SPSS 12 made Simple: Release*. Hove: Psychology Press, 2004. ISBN: 1-8416-9524-6. (*Another undergraduate level guide to SPSS targeted mainly at Psychologists. Quite a strong book on the grounds that it is contemporary and comprehensive – a huge range of techniques are covered in terms of their SPSS applications. Unfortunately, almost all instructions involve SPSS GUI menus rather than syntax).*

†Kohler, U., & Kreuter, F. *Data Analysis Using Stata*. College Station, Texas: Stata Press, 2005. *(Recommended as a detailed account of working with Stata. A new edition is expected 2008/9).*

*Marsh, C. *Exploring data : an introduction to data analysis for social scientists*. Cambridge: Polity Press, 1988. ISBN: 0-7456-0172-3 *(A great example of accessible statistics writing and an excellent overview of techniques of exploratory data analysis and presentation. Also includes useful appendices describing data resources, though these are now becoming dated).*

*†Proctor, M. "Analysing Survey Data", p252-268 in Gilbert, G.N (ed) *Researching Social Life*. London: Sage, 2001. ISBN: 0-7619-7244-7. (*Outstanding as a simple introductory chapter).*

††‡Rabe-Hesketh, S. and Everitt, B. *A Handbook of Statistical Analysis using STATA, 4rd edition.* 2007. New York: Chapman and Hall. ISBN: 1-58488-756-7. *(Covers more advanced data analysis issues than many other introductory reviews, but makes for an outstanding collation of resources on working with STATA across a range of data analysis techniques).*

*Robson, C. *Real World Research : a resource for social scientists and practitioner-researchers (2nd Edition)*. 2002. Oxford, Blackwell . ISBN: 0-6312-1305-8. (*Chapter 13 is a thorough 60 page extract reviewing a wide range of quantitative analysis methods, and giving practical advice on undertaking quantitative research).*

*†Rose, D. and Sullivan, O. *Introducing Data Analysis for Social Scientists, 2nd edition.* London: Open University Press, 1996. ISBN: 0-3351-9617-9. (*Reviews most major issues in data analysis from the UK perspective and with mention of the BHPS. Includes some SPSS illustrations, though some computing advice has become outdated).*

†Wright, D. B. *Understanding Statistics: An introduction for the social sciences.* London: Sage; 1996. ISBN: 0-8039-7918-5.

‡Wonnacott, T. H. and Wonnacott, R. J. *Introductory Statistics for Business and Economics. 4th Edition.* New York: Wiley; 1990. ISBN: 0-471-61517-X (*Another 'classic' high seller – similar to Blalock's – which covers a wide range of data analysis issues in a through and understandable way. Widely used in business / marketing courses. A 1977 edition of this book is the only edition available in Stirling library).*

In addition to conventional textbooks, there are many resources available over the internet which are concerned with describing or teaching about methods of quantitative data analysis. Using search

engines for instance, you are very likely to come across online copies of teaching courses for students at a similar level, from universities all over the world.. One well established online textbook is maintained by 'statsoft' :

http://www.statsoft.com/textbook/stathome.html

Some other internet resources are linked from the 'information' pages of the Longitudinal Data Analysis WebCT site.

One teaching resource provided for UK academics gives a series of presentations and examples concerned with analysing data from UK census datasets, see the CHCC project :

http://www.ccsr.ac.uk/research/chcc/

Another teaching resource that uses examples from the British Crime Survey to illustrate the use of statistics in social science is the 'X4L' project. This is a very accessible introductory level resource (there are 'learning modules' under the 'resources link; note that the site is still being developed at time of writing) :

http://x4l.data-archive.ac.uk

iii) Simpler introductions to key techniques

Some texts have been written which make a particular effort to introduce quantitative methods in a manner accessible to those with limited confidence. After a bit of time their style can seem laborious and simplistic, but some of them are well worth consulting when a reader is struggling to digest too many new terms:

Cramer, D. and Howitt, D. *The SAGE Dictionary of Statistics: A practical resource for students in the social sciences.*London: Sage; 2004. ISBN: 0-7619-4137-1. (*Accessible dictionary format descriptions of many technical terms).*

Fielding, J. L. and Gilbert, G. N. *Understanding Social Statistics.* London: Sage; 2006. ISBN: 1-4129-1054-4. (*Recommended as a very first point of call).*

Garner, R. *The Joy of Stats: A Short Guide to Introductory Statistics for Social Scientists.* Peterborough, Can.: Broadview Press; 2005. ISBN: 155111691X. *(Well worth looking at. The author of this text has put a lot of effort into choosing accessible but relevant examples. Includes a 'math refresher' appendix which could be valuable to anybody revisiting statistics for the first time in years).*

Rowntree, D. *Statistics without tears: A primer for non-mathematicians.* Harmondsworth: Penguin; 1981. ISBN: 0-1402-2326-6.

Salkind, N. J. *Statistics for People Who (Think They) Hate Statistics, 2nd Edition.* London: Sage; 2004. ISBN: 0-7619-7399-0 *(Contains an appendix with SPSS instructions. The first edition from 2000 is little different from the 2004 version).*

Wright, D. B. First Steps in Statistics. 2002. London, Sage. ISBN: 0-7619-5163-6. (*Quite easy, often enjoyable read).*

iv) Data and Variable Management

Processes of data and variable 'management' are central to the data analysis process. A couple of recent textbooks concentrate explicitly upon techniques of data management in SPSS, whilst the Rabe-Hesketh and Everitt text covers a number of data management techniques for Stata:

Boslaugh, S. *An Intermediate Guide to SPSS Programming: Using Syntax for Data Management.* London: Sage; 2005. ISBN: 0761931856. *(Thorough details on common SPSS operations presented in a relatively accessible format. Examples concern small rather than large scale datasets, but they may be easily extended).*

Levesque, R. *Programming and Data Management for SPSS 16: A Guide for SPSS and SAS users.* Chicago: SPSS Inc.; 2008. *(Exhaustive book collating an outstanding range of information on SPSS processing through syntax commands. Highly recommended; a free pdf version of this non-introductory book is available on the SPSS website, www.spss.com/spss/data_management_book.htm).*

Rabe-Hesketh, S. and Everitt, B. *A Handbook of Statistical Analysis using STATA, 4rd edition.* 2007. New York: Chapman and Hall. ISBN: 1-58488-756-7. *(Covers more advanced data analysis issues than many other introductory reviews, but makes for an outstanding collation of resources on working with STATA across a range of data analysis techniques).*

Stata press also publish their own 'Data Management Reference Manual' for that package, see http://www.stata.com/bookstore/documentation.html .

An important element of data analytical social science is the consideration of practical issues in operationalising and then analysing 'key variables' in the social sciences. An accessible, but now somewhat dated, text on the topic is:

Burgess, R. G. *Key Variables in Social Investigation.* London: Routledge; 1986. ISBN: 0710099010.

Moreover, many of the chapters from this edited book have been made available online via the UK's Question Bank facility, see:

http://qb.soc.surrey.ac.uk/resources/keyvariables/keyvariables.htm

More recent British books of some relevant are:

Dorling, D. and Simpson, S. 1999. 'Statistics in Society : The Arithmetic of Politics' *Arnold Applications of Statistics*. London: Arnold.

Shaw, M., Galobardes, B., Lawlor, D.A., Lynch, J., Wheeler, B. and Davey Smith, G. 2007. *The Handbook of Inequality and Socioeconomic Position: Concepts and Measures*. Bristol: Policy Press.

Another important online resource concerned with the operationalisation of variables for quantitative analysis is the UK governments advice of 'harmonised concepts and questions for government social surveys', see

http://www.ons.gov.uk/about-statistics/harmonisation/index.html

See also:

http://www.longitudinal.stir.ac.uk/variables/

For other overviews see:

Hoffmeyer-Zlotnik, J. H. P. and Wolf, C. 2003. *Advances in Cross-national Comparison: A European Working Book for Demographic and Socio-economic Variables*. Kluwer Academic / Plenum Publishers. ISBN: 0306477319. (*This book reviews a number of variable operationalisations from the perspective of conducting cross-nationally comparative research).*

Braun, M. and Mohler, P.Ph. 2003 "Background Variables", p101-116 of Harkness, J., Van de Vijver, F.J.R. and Mohler, P.Ph., *Cross-Cultural Survey Methods* New York: Wiley. ISBN: 0471385263. *(Looks at variable operationalisations for cross-national research).*

Seale, C. (ed) *Social Research Methods: A reader*. London: Routledge; 2004. ISBN: 0415300843. *(See chapters 16, 17, 18 for early statements on working with variable representations).*

Some UK books critical of the production of statistical results from variable indicators are:

Dorling, D. and S. Simpson, (eds). *Statistics in Society : The Arithmetic of Politics*. London: Arnold, 1999. ISBN: 034071994X. *(Tries to be a contemporary 'Demystifying Social Statistics', see below)*..

Huff, D. *How to Lie with Statistics*. London: Gollancz, 1954. ISBN: 575004207.

Irvine, J., I. Miles, and J. Evans, (eds). *Demystifying Social Statistics*. London: Pluto Press, 1979. ISBN: 0-8610-4068-6. *(Influential, highly critical, collection of chapters on data constructions).*

Levitas, R. and W. Guy, (eds). *Interpreting Official Statistics*. London: Routledge, 1996. ISBN: 0415108365.

The two more recent ones have the advantage of being contemporary in a field where the important issues regularly change. However, the books by Huff and by Irvine et al, whilst dated, have been very influential in the social sciences.

Some selected references which deal with particular concepts and their variable representations are:

Lambert, P.S., Tan, K.L.L., Turner, K.J., Gayle, V., Prandy, K. and Sinnott, R.O. 2007. 'Data Curation Standards and Social Science Occupational Information Resources'. *International Journal of Digital Curation* 2: 73-91. (http://www.ijdc.net/./ijdc/issue/current) .

Modood, T. et al, *Ethnic Minorities in Britain: Diversity and Disadvantage* London: Policy Studies Institute, 1997. ISBN: 0853746702. *(See the section 'Defining ethnic groups' in the introduction. See the 2002 edition of Sociology (36/2), for two articles, by Smith and Modood et al, which discuss these categorisations further).*

Sillitoe, K. and P. H. White, "Ethnic Group and the British Census : the search for a question," *Journal of the Royal Statistical Society, Series A : Statistics in Society* 155 (1): 141-163 (1992).

Rose, D. and D. J. Pevalin. 2003. *A Researcher's Guide to the National Statistics Socio-economic Classification*. London: Sage. ISBN: 0761973222.

v) Research examples

Social Scientists will usually find data analysis easier to engage with after seeing examples of sociological research reports in which the use of quantitative methods to analyse census or survey datasets is central. Below are some suggestions. (Some specific examples concerning Longitudinal quantitative research are covered in the reference guide on Longitudinal research).

Introductory

Berthoud, R. and J. Gershuny. 2000. *Seven Years in the Lives of British Families*. London: Policy Press (in association with The Institute for Social and Economic Research, University of Essex). ISBN: 1861342004. (*A collection of accessible example applications using the BHPS's longitudinal data).*

Modood, T. et al, *Ethnic Minorities in Britain: Diversity and Disadvantage* London: Policy Studies Institute, 1997. ISBN: 0853746702. (*An example of a whole book based upon the analysis of data from one large scale cross-sectional survey).*

Park, A.; Curtice, J.; Thomson, K.; Jarvis, L., and Bromley, C. *British Social Attitudes: The 20th Report*. London: Sage; 2003. ISBN: 0761942777. *(Represents one example from a well known series of reports into "British Social Attitudes", presenting various chapters containing a range of analyses based upon responses to regularly conducted national level attitude surveys).*

Portes, A. and Rumbaut, R.G. *Legacies: The Story of the Immigrant Second Generation*. Berkeley: University of California Press, 2001.ISBN: 0520228480. (*Excellent example of a 'mixed methods' study, main findings come from a survey analysis but extensive use is made of other research methods also).*

Intermediate

Marshall, G., Swift, A., and Roberts, S. *Against the Odds? Social Class and Social Justice in Industrial Societies.* Oxford: Oxford University Press; 1997. ISBN: 0198292392. *(One of many outputs from the quantitatively advanced tradition in sociological stratification research. Includes explanatory notes on technicuqes of analysis and variable constructions within a series of appendices).*

Mirowsky, J. and Ross, C.E. *Education, Social Status and Health.* New York: Aldine de Gruyter; 2003. ISBN: 0202307077. *(Analyses a longitudinal survey looking at gradations in health by education levels and other factors – numerous examples of graphical displays, multiway tables and regression models).*

vi) Key techniques in social science data analysis

Aside from the overview texts highlighted in section (ii), there are many works which concentrate on selected methods of data analysis more specifically. Below is a selection of more accessible references on such topics.

Allison, P. D. *Multiple Regression: A primer*. 1999. London, Sage. ISBN: 0761985336. *(Extremely helpful practitioner oriented guide).*

Berk, R.A. *Regression Analysis: A constructive critique.* 2004. London: Sage. ISBN: 0761929045. *(Thorough introduction to regression from a theoretical viewpoint).*

Berry, W. D. *Understanding Regression Assumptions*. Newbury Park, California: Sage, 1993. ISBN: 080394263X.

Cramer, D. *Advanced Quantitative Data Analysis.* Buckingham: Open University Press, 2004. ISBN: 0-3352-0059-1. (*A series of introductory chapters describing alternative techniques, Parts 2 and 4 cover regression models. Helpful, though not really as 'advanced' as the title suggests!).*

Cramer, D. and Howitt, D. *The SAGE Dictionary of Statistics: A practical resource for students in the social sciences.* London: Sage, 2004. ISBN: 0-7619-4137-1. (*Accessible dictionary format descriptions of many technical terms).*

Foster, J.J., Barkus, E. and Yavorsky, C. *Understanding and Using Advanced Statistics*. London: Sage, 2005. *(Chapters cover a selection of multivariate analyses techniques with mention of SPSS implementations.)*

Gilbert, G.N. *Analyzing Tabular Data : Loglinear and logistic models for social researchers*. London: UCL Press, 1993. ISBN: 1857280903. (*Outstanding introduction to loglinear modelling).*

Hardy, M. and Bryman, A. (eds) *Handbook of Data Analysis*. London: Sage, 2004. ISBN: 0761966528. (*See part 2 for a series of chapters concerned with types of regression modeling).*

Menard, S. *Applied Logistic Regression Analysis*. London: Sage, 1995. ISBN 0803957572. *(A second edition of this short book appeared in 2002).*

Rabe-Hesketh, S. and Everitt, B. *A Handbook of Statistical Analysis using STATA, 3rd edition*. 2004. New York: Chapman and Hall. ISBN: 1-58488-405-5. *(Covers more advanced data analysis issues than many other introductory reviews, but makes for an outstanding collation of resources on working with STATA across a range of data analysis techniques).*

Sturgis, P. "Analysing Complex Survey Data: Clustering, Stratification and Weights", *Social Research Update*, 43, http://sru.soc.surrey.ac.uk/SRU43.html , 2004. *(Short introduction to the analytical approaches to sample survey weighing for complex survey datasets).*

Generally speaking, it is worth being aware of the Sage 'little green book' series 'Quantitative Applications in the Social Sciences'. Publications in this series have given approachable reviews of particular quantitative techniques for over 20 years. See: www.sagepub.co.uk .

vii) Advanced methods in social science data analysis

The next stage in learning quantitative data analysis skills is to start looking at more specific techniques and applications in greater detail. There's almost no upper limit to the complications or extensions in this regard – entire academic disciplines, such as Statistics, Mathematics and Econometrics, devote themselves to extending the complexity of quantitative techniques! An indicative list of a few prominent texts is given below, whilst other materials in the Longitudinal Data Analysis project cover more specifically issues in applying quantitative techniques to longitudinal information.

Allison, P.D. *Missing Data*. Thousand Oaks, Ca: Sage, 2002.

Buckingham, A. and Saunders, P. The Survey Methods Workbook. Cambridge: Polity Press, 2004. ISBN: 0745622453. (*This introductory text also has an online appendix featuring handouts on several 'advanced' techniques).*

Blossfeld, H-P. and Rohwer, G. *Techniques of Event History Modelling: New Approaches to Causal Analysis (2nd Edition).* New York: Lawrence Erlbaum Associates, 2002. ISBN: 0805840915. (*Very approachable guide to methods of event history (or 'survival') analysis, including guides to the free software package TDA. An update to this text, using Stata examples, was published in 2007).*

Cramer, D. *Advanced Quantitative Data Analysis.*Buckingham: Open University Press, 2004. ISBN: 0-3352-0059-1. (*A series of introductory chapters describing alternative techniques, Parts 2 and 4 cover regression models. Useful, though not really as 'advanced' as the title suggests!).*

Dale, A. and Davies, R.B. (eds) *Analyzing Social and Political Change: A Casebook of Methods*. London: Sage, 1994. ISBN: 0803982984. (*An excellent overview (with easily read editors' introductions) into various methods of analysis for longitudinal data structures)*

Foster, J.J., Barkus, E. and Yavorsky, C. *Understanding and Using Advanced Statistics*. London: Sage, 2005. *(Chapters cover a selection of multivariate analyses techniques with mention of SPSS implementations.)*

Gellman, A., Hill, J. *Data Analysis using Regression and Multilevel/Hierarchical Models.* Cambridge: Cambridge University Press, 2007. *(A popular advanced review of multilevel modelling approaches with extended details on wider issues in estimating and interpreting regression analysis. A rich source for examples of regression models and graphical representations of their results in the freeware R).*

Greenacre, M. and Blasius, J. *Correspondence Analysis in the Social Sciences : Recent developments and applications*. London: Academic Press, 1994. ISBN: 0121045706. (*Describes and reviews the role of Correspondence Analysis, a popular descriptive technique in certain research fields, and in France)*

Greene, W.H. *Econometric Analysis, 4th edition.* 1999. New York: Prentice Hall. ISBN: 0-13-015679-5. *(Highly influential econometrics textbook closely associated with the author's equally influential software 'LIMDEP'. Comprehensively reviews econometric techniques through the medium of matrix algreba: difficult!).*

Hardy, M. and Bryman, A. (eds) *Handbook of Data Analysis.* London: Sage, 2004. ISBN: 0761966528. (O*utstanding collection of methodological chapters, all are of a relatively advanced nature whilst parts 3 and 4 cover techniques that are still under development).*

Kreft, I. and J. de Leeuw. *Introducing Multilevel Modelling.* London: Sage; 1998. ISBN: 0761951415 (*Further information / references on multilevel modelling can be found at http://multilevel.ioe.ac.uk/)*

Long, J. Scott and Freese, J. *Regression Models for Categorical Dependent Variables Using Stata, 2nd edition*. College Station, Tx.: Stata Press; 2006. ISBN: 1597180115.

Manski, C. F. *Identification Problems in the Social Sciences*. Cambridge, Mass.: Harvard University Press; 1995. ISBN: 0674442849. (*A difficult text which problematises most forms of analysis, this serves as an example of where much econometric analysis of social data is coming from).*

Maxim, P.S. *Quantitative Research Methods in the Social Sciences*. Oxford: Oxford University Press. ISBN: 0195114655 (*This is quite an advanced text, it combines critical discussion of data analysis methods with discussion of the more complex statistical methods that can be used to address them).*

Rose, D. (ed) *Researching Social and Economic Change : The uses of household panel studies*. London: Routledge, 2000. ISBN: 1857285476. (*See the three chapters in part 1 for introductions to the role of panel studies).*

Scott Long, J. and Freese, J. 2006. *Regression Models for Categorical Dependent Variables Using Stata, 2nd Edition*. Texas: Stata Press. ISBN: 978-1-59718-011-5.

Skrondal, A. and Rabe-Hesketh, S. 2004. *Generalized Latent Variable Modelling: Multilevel, Longitdinal, and Structural Equation Models*. London: Chapman and Hall/CRC. ISBN: 1584880007.

Taris, T. W. 2000. *A Primer in Longitudinal Data Analysis*. London: Sage. ISBN: 0761960279. (*An easy introduction to types of longitudinal analysis).*

Winship, C. and Mare, R.D. 1992. "Models for sample selection bias". *Annual Review of Sociology.* 18:327-50. *(Although they are largely ignored by sociological researchers, models to account for 'selection' effects are seen by many economists as absolutely crucial to the attempt to describe social processes. This review is one of a number of attempts – in practice unsuccessful – to communicate this idea to other social science disciplines).*