Fiona Steele

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Education	1996, Ph.D. in Statistics University of Southampton 1993 M.Sc. in Social Statistics University of Southampton 1992 B.Sc. (Hons) in Mathematics and Statistics University of Edinburgh
Employment	September 2013 – present Professor of Statistics Department of Statistics London School of Economics and Political Science September 2019 – August 2022 Head of Department Department of Statistics London School of Economics and Political Science September 2018 – August 2019 Deputy Head of Department Department of Statistics London School of Economics and Political Science August 2008 – August 2013 Professor of Social Statistics University of Bristol March 2010 – August 2013 Director, Centre for Multilevel Modelling University of Bristol September 2005 – July 2008 Reader in Social Statistics University of Bristol July 2001 – August 2005 Research Lecturer in Statistics Institute of Education, University of London September 1996 – June 2001 Lecturer in Statistics and Research Methodology London School of Economics and Political Science

HONOURS AND AWARDS

CBE (Commander of the British Empire) 2022

OBE (Officer of the British Empire) 2011

Fellow of the British Academy, elected 2009

Royal Statistical Society Guy Medal in Bronze, 2008

Honorary DSci, University of Aberdeen, awarded 2019

Honorary Professor, Institute of Social Science Research, University of Queensland, 2013 - 2022

LSE Excellence in Education Award, 2016 and 2018

Ken Foreman lecturer, Australian Statistical Congress and Australian Bureau of Statistics, 2008

Visiting Fellow, Centre for Advanced Study, Norwegian Academy of Science and Letters, Oslo, 2007

RESEARCH INTERESTS

Interests in social statistics, with particular expertise in the development of multilevel modelling, event history analysis and simultaneous equations modelling techniques and their application across the social sciences.

Methodological research includes:

- Longitudinal data analysis, including event history analysis for repeated events, competing risks, multiple states, long-term survivors, and correlated processes
- Multilevel simultaneous equations modelling
- Multilevel factor analysis
- Methods for the analysis of survey nonresponse

Applications of statistical modelling in the following areas:

- Demography (residential mobility, fertility, union formation and dissolution, contraceptive discontinuation and method switching)
- Education (the consequences of parental divorce for children's educational outcomes, the impact of school resources on pupil attainment)
- Family psychology (reciprocal influences between parents and children, sibling interactions)
- Health (child health, mental health and employment transitions, determinants and consequences of stress among nurses)

RESEARCH GRANTS

"Methods for the Analysis of Longitudinal Dyadic Data with an Application to Intergenerational Exchanges of Family Support", ESRC and EPSRC, £780k, October 2017-September 2021 (Principal Investigator).

"LEMMA 3: Longitudinal Effects, Multilevel Modelling and Applications", ESRC (National Centre for Research Methods node), £1.4m, October 2011-March 2015 (Principal Investigator).

" Interrelationships between Housing Transitions and Fertility in Britain and Australia", ESRC, £488k, October 2010 – March 2014 (Principal Investigator).

"STRUCTURES for Building, Learning, Applying and Computing Statistical Models", £1.17 million, ESRC (National Centre for Research Methods node), October 2008-September 2011 (Principal Investigator from

March 2010).

"Methods for Modelling Repeated Measures in a Lifecourse Framework", MRC Methodology Programme, £435k, April 2011-March 2014 (Co-applicant).

"Hierarchical Analysis of Unit Nonresponse in Sample Surveys", ESRC, £569k, September 2007-August 2010 (Co-applicant).

"Missing Data in Life-long Observational Studies: An Application to the Effect of Social Standing on Adult Cardiovascular Health". ESRC, £77k, August 2007-July 2008. Postdoctoral Fellowship awarded to Dr Daphne Kounali (Mentor).

"An Examination of the Impact of Family Socio-Economic Status on Outcomes in Late Childhood and Adolescence", ESRC, £3.5 million, October 2006 – September 2011 (Co-applicant).

"LEMMA: Learning Environment for Multilevel Methodology and Applications", ESRC, £688,942, April 2005 – March 2008 (named co-director).

"Developing Multilevel Models for Realistically Complex Social Science Data", £281,578, Economic and Social Research Council, October 2003-September 2006 (Co-applicant).

"Multilevel Multiprocess Modelling of Partnership and Childbearing Event Histories", £128,505, Economic and Social Research Council (Research Methods Programme), June 2003 – May 2005 (Principal Investigator).

CONSULTANCY

Advised on methods for estimating the effect of employment on recidivism for the Ministry of Justice, November 2012.

Review of Innovation, Development and Methodology for Office of National Statistics, May-July 2006.

Multilevel multiprocess modelling of the effect of school resources on pupil attainment in secondary schools, project based at the Institute of Education and funded by Department for Education and Skills, November 2004-December 2004.

Multilevel modelling of data from a pilot study on the relationship between resourcing and pupil attainment in schools, project based at the Institute of Education and funded by Department for Education and Skills, November 2002-January 2003.

Multilevel factor analysis of data from a survey on schools' views on their Local Education Authority, National Audit Office, November 2002.

Development of an imputation method to adjust for undercoverage in the 2001 England and Wales census, Office for National Statistics, July 1998-September 1999.

Quality assurance report on a project concerned with new methodology for the allocation of funds for children's social services, Department of Health, July 1996.

TEACHING EXPERIENCE

- Programme Director for MSc Statistics at LSE 2014-2017.

- Experience of teaching statistics at all levels to a wide range of audiences, with varying degrees of familiarity and confidence in mathematics and statistics.

- Led the development of the Advanced Quantitative Methods (AQM) PhD pathway for the South West

Doctoral Training Centre, including a programme of short courses available to all PhD students as Advanced Training. Co-ordinator of the AQM pathway 2011-12.

- Led the development of a virtual learning environment for multilevel modelling (launched April 2008)

- Responsible for the organisation of statistics teaching at the Institute of Education, 2001-05. This involved organising and contributing to the teaching of courses at introductory, intermediate and advanced level.

- Provision of statistical advisory service for research students and staff at the Institute of Education, 2001-05.

- Course tutor for the MSc in Social Research Methods (with Statistics) at LSE, 1996-2001.

- Undergraduate and postgraduate units on various topics in social statistics, including logistic regression, multivariate data analysis, multilevel modelling, event history analysis, survey methods, and experimental design in social research

- Short courses on multilevel modelling and longitudinal data analysis at various locations in the UK, Europe, the U.S., Bangladesh, India and Ethiopia

PROFESSIONAL ACTIVITIES

Economic and Social Research Council (ESRC)

Member of ESRC peer review college, 2011 – present.

Member of the ESRC Methods and Infrastructure Committee, 2007 – 2011.

Panel member for several ESRC commissioning panels, including Large Grants competition 2008-09 and Centres/Large Grants competition 2011-12.

British Academy

Member of British Academy High-Level Skills Group on Quantitative Skills, 2018-2019.

Member of S4 Section standing committee, 2014-2018.

Member of British Academy steering group for State of the Nation on Quantitative Skills project, 2014 –2016.

Panel Chair for British Academy Language and Quantitative Skills acquisitions awards, 2013.

Royal Statistical Society (RSS)

Member of the RSS Academic Affairs Advisory Group, 2013 – 2017.

Member of the RSS Honours Committee, 2014 – 2017 and 2023-.

Chair of the RSS Avon local group, 2010 – 2013 (committee member 2006-2010).

Member of Council of the RSS, 2004 – 2008.

Member of the Social Statistics Section committee of the RSS, 2004- 2010.

Member of steering committee for the RSS Professional Development Centre, 2007 – 2011.

Fellow of the RSS.

Journal editing and reviewing

Associate editor for *Journal of the Royal Statistical Society, Series A* (*Statistics in Society*), 2005 – 2008, and 2015-2018.

Member of the editorial board for *Longitudinal and Life Course Studies: International Journal*, 2009 - present

Member of the editorial board for *Sociological Methodology*, 2010 – 2012.

Member of the editorial board for the *International Journal of Social Research Methodology*, 2000-2004.

Co-editor of a special issue of the *International Journal of Social Research Methodology* on "Combining Qualitative and Quantitative Methods".

Other

Member of Sub-panel for Mathematical Sciences, Research Excellence Framework (REF) 2021

Chair of Independent Advisory Board for the National Centre for Research Methods, 2020-present.

Member of International Scientific Advisory Board of the Business Research Unit of Instituto Universitário de Lisboa (Portugal) BRU-IUL.

Member of the Advisory Group for the ESRC-funded "Understanding Inequalities" project (PI Prof Susan McVie, University of Edinburgh)

External examiner for the Methodology Institute, London School of Economics, 2009-2011.

External examiner for undergraduate quantitative methods courses, Division of Social Statistics, University of Southampton, 2007-2010

PUBLICATIONS

Books

Bartholomew, D.J., Steele, F., Moustaki, I. and Galbraith, J. (2008) *Analysis of Multivariate Social Science Data* . 2nd edition. CRC Press.

Bartholomew, D.J., Steele, F., Moustaki, I. and Galbraith, J. (2002) *The Analysis and Interpretation of Multivariate Data for Social Scientists*. CRC Press.

Rasbash, J., Steele, F., Browne, W. and Goldstein, H. (2009) *A User's Guide to MLwiN, Version 2.10*. Centre for Multilevel Modelling, University of Bristol.

Papers in refereed journals

Pillinger, R., Steele, F., Leckie, G. and Jenkins, J. (in press) "A dynamic social relations model for clustered longitudinal dyadic data with continuous or ordinal responses." *Journal of the Royal Statistical Society, Series A.*

Steele, F., Zhang, S., Grundy, E. and Burchardt, T. (in press) "Longitudinal analysis of exchanges of support between parents and children in the UK." *Journal of the Royal Statistical Society, Series A.*

Kuha, J., Zhang, S. and Steele, F. (2023) "Latent variable models for multivariate dyadic data with zero inflation: analysis of intergenerational exchanges of family support." *Annals of Applied Statistics*, 17(2): 1521-1542.

Burchardt T, Steele F, Grundy E, Karagiannaki E, Kuha J, Moustaki I, Skinner C, Zhang N and Zhang S.

(2021) "Welfare within Families beyond Households: Intergenerational Exchanges of Practical and Financial Support in the UK*." LSE Public Policy Review*, 2(1): 4: 1–11. DOI: https://doi.org/10.31389/lseppr.41

Steele, F. and Grundy, E. (2021) "'Random effects dynamic panel models for unequally-spaced multivariate categorical repeated measures: an application to child-parent exchanges of support." *Journal of the Royal Statistical Society, Series C*, 70(1): 3-23.

Zhu, Y., Steele, F. and Moustaki, I. (2020) "A multilevel SEM for the interrelationships between multiple latent dimensions of childhood socioeconomic circumstances, partnership transitions and midlife health." *Journal of the Royal Statistical Society, Series A*, 183(3): 1029-1050.

Sayers, A., Steele, F., Whitehouse, M.R., Price, A., Ben-Shlomo, Y., and Blom, A.W. (2020) Association between surgical volume and failure of primary total hip replacement in England and Wales: findings from a prospective national joint replacement register. *BMJ Open*, 10 (9).

Skinner, C and Steele, F. (2020) "Estimation of dyadic characteristics of family networks using sample survey data." *Annals of Applied Statistics*, 14(2): 706-726.

Sindall, K., Sturgis, P., Steele, F., Leckie, G. and French, R. (2019) "A reassessment of socio-economic gradients in child cognitive development using Growth Mixture Models." *Longitudinal and Life Course Studies*, 10(3): 283-305.

Steele, F., Clarke, P.S. and Kuha, J. (2019) "Modeling within-household associations in household panel studies". *Annals of Applied Statistics*, 13(1): 367-392.

Jones, M.C., Smith, K., Herber, O., White, M., Steele, F. and Johnston, D.W. (2018) "Intention, beliefs and mood assessed using electronic diaries predicts attendance at cardiac rehabilitation: An observational study". *International Journal of Nursing Studies*, 88: 143-152.

Zhu, Y., Steele, F. and Moustaki, I. (2017) "A general 3-step maximum likelihood approach to estimate the effects of multiple latent categorical variables on a distal outcome". *Structural Equation Modeling: A Multidisciplinary Journal*, 24(5): 643-656.

Steele, F., Clarke, P., Leckie, G., Allan, J., and Johnston, D.W. (2017) "Multilevel structural equation models for longitudinal data where predictors are measured more frequently than outcomes: an application to the effects of stress on cognitive function of nurses". *Journal of the Royal Statistical Society, Series A,* 180 (1): 263-283.

Sayers, A., Heron, J., Smith A.D., Macdonald-Wallis, C., Gilthorpe, M.S., Steele, F. and Tilling, K. (2017) "Joint modelling compared with two-stage methods for analysing longitudinal data and prospective outcomes: A simulation study of childhood growth and blood pressure". *Statistical Methods in Medical Research*, 26(1): 437-452.

Ermisch, J. and Steele, F. (2016) "Fertility expectations and residential mobility in Britain". *Demographic Research*, 35: 1561-1584. (Recipient of Editor's Choice Award.)

Steele, F., Washbrook, E., Charlton, C. and Browne, W.J. (2016) "A longitudinal mixed logit model for estimation of push and pull effects in residential location choice". *Journal of the American Statistical Association*, 111 (515): 1061-1074.

Hanly, M., Clarke, P. and Steele, F. (2016) "Sequence analysis of call record data: exploring the role of different cost settings". *Journal of the Royal Statistical Society, Series A*, 179 (3): 793-808.

Sayers, A., Ben-Shlomo, Y., Blom, A. and Steele, F. (2016) "Probabilistic record linkage". *International Journal of Epidemiology*, 45(3): 954-64.

French, R. and Steele, F. (2015) "Trajectories of frailty for the elderly in Britain". *Longitudinal and Life Course Studies*, 6(3): 303-318. http://dx.doi.org/10.14301/llcs.v6i3.317

Perlman, M., Lyons-Amos, M., Leckie, G., Steele, F. and Jenkins, J. (2015) "Capturing the sequence of interaction between young siblings". *PLoS ONE*, 10(5): e0126353. doi:10.1371/journal.pone.0126353

Clarke, P., Crawford, C., Steele, F. and Vignoles, A. (2015) "Revisiting fixed- and random-effects models: some considerations for policy-relevant education research". *Education Economics*, 23(3): 259-277.

Helske, S., Steele, F., Koku, K. and Eerola, M. (2015) "Partnership formation and dissolution over the life course: applying sequence analysis and event history analysis in the study of recurrent events". *Longitudinal and Life Course Studies*, 6(1): 1-25.

Washbrook. E., Clarke, P.S. and Steele, F. (2014) "Investigating non-ignorable drop-out in panel studies of residential mobility". *Journal of the Royal Statistical Society, Series C*, 63(2): 239-266.

Kulu, H. and Steele, F. (2013) "Interrelationships between childbearing and housing transitions in the family life course". *Demography*, 50(5): 1687-1714.

Steele, F., French, R. and Bartley, M. (2013) "Adjusting for selection bias in longitudinal analyses of the relationship between employment transitions and health using simultaneous equations modelling". *Epidemiology*, 24(5): 703-711.

Steele, F., Clarke, P. and Washbrook, E. (2013) "Modeling household decisions using longitudinal data from household panel surveys, with applications to residential mobility". *Sociological Methodology*, 43(1): 225-276.

Szmaragd, C., Clarke, P. and Steele, F. (2013) "Subject specific and population average models for binary longitudinal data: a tutorial". *Longitudinal and Life Course Studies*, 4(2): 147-165.

Durrant, G.B., D'Arrigo, J. and Steele, F. (2013) "Analysing interviewer call record data using a multilevel discrete-time event history modelling approach". *Journal of the Royal Statistical Society, Series A*, 176(1): 251-269.

Steele, F., Rasbash, J. and Jenkins, J. (2013) "A multilevel simultaneous equations model for within-cluster dynamic effects, with an application to reciprocal parent-child and sibling effects". *Psychological Methods*, 18(1): 87-100.

Steele, F. and Durrant, G.B. (2011) "Alternative approaches to multilevel modeling of survey noncontact and refusal". *International Statistical Review,* 79: 70-91.

Durrant, G.B., D'Arrigo, J. and Steele, F. (2011) "Using field process data to predict best times of contact conditioning on household and interviewer influences". *Journal of the Royal Statistical Society, Series A* 174(4): 1-21.

Steele, F. (2011) "Multilevel discrete-time event history analysis with applications to the analysis of recurrent employment transitions" (with discussion). *Australia and New Zealand Journal of Statistics*, 53 (1): 1-20.

Ginsburg, C., Steele, F., Richter, L.M and Norris, S.A. (2011) "Modelling Residential Mobility: Factors Associated with the Movement of Children in Greater Johannesburg", *Population, Space and Place*, 17(5): 611-626.

Durrant, G.B., Groves, B., Staetsky, L. and Steele, F. (2010) "Effects of Interviewer Attitudes and Behaviors on Refusal in Household Surveys", *Public Opinion Quarterly*, 74(1): 1-36.

Steele, F., Sigle-Rushton, W. and Kravdal, Ø. (2009) "Consequences of Family Disruption on Children's Educational Outcomes in Norway", *Demography*, 46(3): 553-574.

Browne, W.J., Steele, F., Golalizadeh, M. and Green, M. (2009) "The Use of Simple Reparameterisations in MCMC Estimation of Multilevel Models with Applications to Discrete-Time Survival Models", *Journal of the Royal Statistical Society, Series A,* 172(3): 579-598.

Durrant, G.B. and Steele, F. (2009) "Multilevel Modelling of Refusal and Noncontact in Household Surveys:

Evidence from Six UK Government Surveys", *Journal of the Royal Statistical Society*, *Series A*, 172(2): 361-381.

Steele, F. (2008) "Multilevel Models for Longitudinal Data" *Journal of the Royal Statistical Society*, *Series A* 171(1): 5-19.

Steele, F., Vignoles, A. and Jenkins, A. (2007) "The Impact of School Resources on Student Attainment: A Multilevel Simultaneous Equation Modelling Approach", *Journal of the Royal Statistical Society*, *Series A* 170(3): 801-824.

Steele, F., Kallis, C. and Joshi, H. (2006) "The Formation and Outcomes of Cohabiting and Marital Partnerships in Early Adulthood: The Role of Previous Partnership Experience", *Journal of the Royal Statistical Society*, *Series A* 169(4): 757-779.

Steele, F. and Goldstein, H. (2006) "A Multilevel Factor Model for Mixed Binary and Ordinal Indicators of Women's Status", *Sociological Methods & Research* 35(1): 137-153.

Steele, F., Joshi, H., Kallis, C. and Goldstein, H. (2006) "Changing Compatibility of Cohabitation and Childbearing between Young British Women born in 1958 and 1970", *Population Studies* 60(2): 137-152.

Moustaki, I. and Steele, F. (2005) "Latent Variable Models for Mixtures of Categorical and Survival Responses, with an Application to Fertility Preferences and Family Planning in Bangladesh", *Statistical Modelling* 5(4): 327-342.

Steele, F., Kallis, C., Goldstein, H. and Joshi, H. (2005) "The Relationship between Childbearing and Transitions from Marriage and Cohabitation in Britain", *Demography*, 42: 647-673.

Steele, F., Goldstein, H. and Browne, W. (2004) "A General Multistate Competing Risks Model for Event History Data, with an Application to a Study of Contraceptive Use Dynamics", *Statistical Modelling* 4(2): 145-159.

Zhang, W. and Steele, F. (2004) "A Semiparametric Multilevel Survival Model". *Journal of the Royal Statistical Society*, *Series C*, 53: 387-404.

Steele, F. (2003) "A Multilevel Mixture Model for Event History Data with Long-term Survivors: An application to an Analysis of Contraceptive Sterilisation in Bangladesh." *Lifetime Data Analysis*, 9: 155-174.

Steele, F. (2003) "Selection Effects of Source of Contraceptive Supply in an Analysis of Contraceptive Discontinuation: Multilevel Modelling when Random Effects are Correlated with an Explanatory Variable". *Journal of the Royal Statistical Society*, *Series A*, 166: 407-424.

Steele, F. and S.L. Curtis. (2003) "Appropriate Methods for Analyzing the Effect of Method Choice on Contraceptive Discontinuation." *Demography*, 40: 1-22.

Steele, F., J. Brown and R. Chambers (2002) "A Controlled Donor Imputation System for a One-Number Census." *Journal of the Royal Statistical Society*, *Series A*, 165: 495-522.

Sear, R., F. Steele, I.A. McGregor and R. Mace (2002) "The Effects of Kin on Child Mortality in Rural Gambia." *Demography*, 39(1): 43-63.

Steele, F., S. Amin and R.T. Naved (2001) "Savings/Credit Group Formation and Change in Contraception." *Demography*, 38: 267-282.

Steele, F. and I. Diamond (1999) "Contraceptive Switching in Bangladesh." *Studies in Family Planning*, 30: 315-328.

Steele, F. and F. El-Zahraa M.M. Geel. (1999) "The Impact of Family Planning Supply Factors on Unmet Need in Rural Egypt 1988-89." *Journal of Biosocial Science*, 31:311-326.

Steele, F., S.L. Curtis and M.K. Choe. (1999) "The Impact of Family Planning Service Provision on Contraceptive

Use Dynamics in Morocco." *Studies in Family Planning*, 30, 28-42.

Curtis, S.L. and F. Steele (1996) "Variations in Familial Neonatal Mortality Risks in Four Countries." *Journal of Biosocial Science*, 28, 141-159.

Steele, F., I. Diamond and S. Amin (1996) "Immunization Uptake in Rural Bangladesh: a Multilevel Analysis." *Journal of the Royal Statistical Society*, Series A, 159, 289-299.

Steele, F., I. Diamond and D. Wang (1996) "The Determinants of the Duration of Contraceptive Use in China: A Multilevel Multinomial Discrete Hazards Modelling Approach." *Demography*, 33, 12-33.

Conference proceedings

Steele, F. (2001) "A Multiprocess Multilevel Model to Allow for Selection Effects of Source of Contraceptive Supply in an Analysis of Contraceptive Discontinuation in Morocco." Invited paper, Conference Proceedings of the 53rd session of the International Statistical Institute, 22-29 August, Seoul, Korea.

Steele, F., J. Brown and R. Chambers. (2000) "A Donor Imputation System to Create a Census Database Fully Adjusted for Underenumeration." Proceedings of the Statistics Canada Symposium on Combining Data from Different Sources, May 1999.

Book chapters

Steele, F. and Goldstein, H. (2006) "Multilevel Models in Psychometrics", In: C.R. Rao and S. Sinharay (Eds.) *Handbook of Statistics, Vol. 26*. Elsevier: Amsterdam, pp.401-420.

Steele, F. and Wang, D. (2006) "Regression Analysis", In: D. Wang and A. Bakhai (Eds.) *Clinical Trials: A Practical Guide to Design, Analysis and Reporting*. Remedica: London, pp.273-286.

Steele, F. (2005) "Structural Equation Modeling: Multilevel", In: B. Everitt and D.Howell (Eds.) *Encyclopedia of Statistics in Behavioral Science*, John Wiley & Sons Ltd, Chichester, Vol. 4, pp. 1927-1931.

Choe, M.K., I. Diamond, F. Steele and S.K. Kim (1998) "Son Preference, Family Building Process and Child Mortality." In: *Two Young to Die: Genes or Gender?* ST/ESA/SER.A/155, pp.208-222. United Nations: New York.

Amin, S., I. Diamond and F. Steele (1997) "Contraception and Religiosity in Bangladesh." In: G.W. Jones, J.C. Caldwell, R.M. Douglas and R.M. D'Souza (Eds). *The Continuing Demographic Transition*. Oxford: Oxford University Press. pp.268-289.

Other

Clarke, P., Crawford, C., Steele, F. and Vignoles, A. (2010) The choice between fixed and random effects models: some considerations for educational research. Centre for Markets and Public Organisation working paper no. 10/240, University of Bristol. http://www.bristol.ac.uk/cmpo/publications/papers/

Steele, F. (2008) Review of A. Skrondal and S. Rabe-Hesketh "Generalized latent variable modelling: multilevel, longitudinal and structural equation models", in *Statistical Methods in Medical Research*, 17: 119.

Steele, F. (2005) *Event History Analysis*. National Centre for Research Methods Review Paper NCRM/004. Downloadable from http://www.ncrm.ac.uk/publications/index.php.

Steele, F. (1999) Invited contribution to discussion of three papers presented at a session on Application of Random Effects/Multilevel Models to Categorical Data in Social Sciences and Medicine at the Royal Statistical Society, *Journal of the Royal Statistical Society, Series A*, 162: 329-330.

Steele, F. (1997) Review of D.W. Wright "Understanding Statistics: An Introduction for the Social Sciences", Sage,

in *British Journal of Sociology*, 48, 712-713.