

Contents

Preface

xv

1 Methods for Longitudinal Surveys

1

Peter Lynn

1.1	Introduction	1
1.2	Types of Longitudinal Surveys	2
1.3	Strengths of Longitudinal Surveys	4
1.3.1	Analysis Advantages	4
1.3.2	Data Collection Advantages	6
1.4	Weaknesses of Longitudinal Surveys	8
1.4.1	Analysis Disadvantages	8
1.4.2	Data Collection Disadvantages	9
1.5	Design Features Specific to Longitudinal Surveys	11
1.5.1	Population, Sampling and Weighting	11
1.5.2	Other Design Issues	13
1.6	Quality in Longitudinal Surveys	15
1.6.1	Coverage Error	15
1.6.2	Sampling Error	16
1.6.3	Nonresponse Error	16
1.6.4	Measurement Error	16
1.7	Conclusions	17
	References	18

2 Sample Design for Longitudinal Surveys

21

Paul Smith, Peter Lynn and Dave Elliot

2.1	Introduction	21
2.2	Types of Longitudinal Sample Design	21
2.3	Fundamental Aspects of Sample Design	23
2.3.1	Defining the Longitudinal Population	23

2.3.2	Target Variables	24
2.3.3	Sample Size	25
2.3.4	Clustering	26
2.3.5	Treatment of Movers	26
2.3.6	Stratification	27
2.3.7	Variances and Design Effects	27
2.3.8	Selection Probabilities	28
2.4	Other Aspects of Design and Implementation	28
2.4.1	Choice of Rotation Period and Pattern	28
2.4.2	Dealing with Births (and Deaths)	29
2.4.3	Sample Overlap	30
2.4.4	Stability of Units and Hierarchies	31
2.5	Conclusion	32
	References	32
3	Ethical Issues in Longitudinal Surveys	35
	<i>Carli Lessof</i>	
3.1	Introduction	35
3.2	History of Research Ethics	35
3.3	Informed Consent	38
3.3.1	Initial Consent	38
3.3.2	Continuing Consent	39
3.3.3	Consent to Trace Respondents	39
3.3.4	Consent for Unanticipated Activities or Analyses	40
3.3.5	Implications for Consent of Changing Circumstances of Sample Members	40
3.3.6	Consent for Linkage to Administrative Data	41
3.3.7	Using Administrative Data without Full Consent	42
3.3.8	Can Fully Informed Consent be Realised?	43
3.4	Free Choice Regarding Participation	43
3.5	Avoiding Harm	46
3.6	Participant Confidentiality and Data Protection	49
3.6.1	Dependent Interviewing	49
3.6.2	The Treatment of Research Data	50
3.7	Independent Ethical Overview and Participant Involvement	52
	Acknowledgements	53
	References	53
4	Enhancing Longitudinal Surveys by Linking to Administrative Data	55
	<i>Lisa Calderwood and Carli Lessof</i>	
4.1	Introduction	55
4.2	Administrative Data as a Research Resource	56
4.3	Record Linkage Methodology	58
4.4	Linking Survey Data with Administrative Data at Individual Level	61
4.4.1	Sampling, Sample Maintenance and Sample Evaluation	61

4.4.2	Evaluation Methodology	62
4.4.3	Supplementing and Validating Survey Data	63
4.5	Ethical and Legal Issues	67
4.5.1	Ethical Issues	68
4.5.2	Legal Issues	68
4.5.3	Disclosure Control	68
4.6	Conclusion	69
	References	69
5	Tackling Seam Bias Through Questionnaire Design	73
	<i>Jeffrey Moore, Nancy Bates, Joanne Pascale and Aniekan Okon</i>	
5.1	Introduction	73
5.2	Previous Research on Seam Bias	74
5.3	SIPP and its Dependent Interviewing Procedures	75
5.3.1	SIPP's Pre-2004 Use of DI	76
5.3.2	Development of New DI Procedures	76
5.3.3	Testing and Refining the New Procedures	78
5.4	Seam Bias Comparison – SIPP 2001 and SIPP 2004	79
5.4.1	Seam Bias Analysis for Programme Participation and Other 'Spell' Characteristics	79
5.4.2	Seam Bias Evaluation for Income Amount Transitions	87
5.5	Conclusions and Discussion	89
	Acknowledgements	90
	References	90
6	Dependent Interviewing: A Framework and Application to Current Research	93
	<i>Annette Jäckle</i>	
6.1	Introduction	93
6.2	Dependent Interviewing – What and Why?	94
6.2.1	Data Quality	94
6.2.2	Survey Processes	95
6.3	Design Options and their Effects	95
6.3.1	Reactive Dependent Interviewing	96
6.3.2	Proactive Dependent Interviewing	97
6.4	Empirical Evidence	99
6.4.1	Income Sources	100
6.4.2	Current Earnings	104
6.4.3	Current Employment	105
6.4.4	Labour Market Activity Histories	105
6.4.5	School-Based Qualifications	106
6.5	Effects of Dependent Interviewing on Data Quality Across Surveys	107

6.6	Open Issues	109
	Acknowledgements	109
	References	110
7	Attitudes Over Time: The Psychology of Panel Conditioning	113
	<i>Patrick Sturgis, Nick Allum and Ian Brunton-Smith</i>	
7.1	Introduction	113
7.2	Panel Conditioning	114
7.3	The Cognitive Stimulus Hypothesis	116
7.4	Data and Measures	117
7.5	Analysis	118
7.6	Discussion	123
	References	124
8	Some Consequences of Survey Mode Changes in Longitudinal Surveys	127
	<i>Don A. Dillman</i>	
8.1	Introduction	127
8.2	Why Change Survey Modes in Longitudinal Surveys?	128
8.3	Why Changing Survey Mode Presents a Problem	130
	8.3.1 Changes in Question Structure	130
	8.3.2 Effects of Visual vs. Aural Communication Channels	132
	8.3.3 Interviewer Presence	135
	8.3.4 How Answers to Scalar Questions are Affected by Visual vs. Aural Communication	136
8.4	Conclusions	137
	References	137
9	Using Auxiliary Data for Adjustment in Longitudinal Research	141
	<i>Dirk Sikkels, Joop Hox and Edith de Leeuw</i>	
9.1	Introduction	141
9.2	Missing Data	142
9.3	Calibration	144
9.4	Calibrating Multiple Waves	147
9.5	Differences Between Waves	149
9.6	Single Imputation	150
9.7	Multiple Imputation	151
9.8	Conclusion and Discussion	153
	References	155
10	Identifying Factors Affecting Longitudinal Survey Response	157
	<i>Nicole Watson and Mark Wooden</i>	
10.1	Introduction	157
10.2	Factors Affecting Response and Attrition	159

10.2.1	Locating the Sample Member	159
10.2.2	Contacting the Sample Member	160
10.2.3	Obtaining the Cooperation of the Sample Member	162
10.2.4	The Role of Respondent Characteristics	164
10.3	Predicting Response in the HILDA Survey	167
10.3.1	The HILDA Survey Data	168
10.3.2	Estimation Approach	169
10.3.3	Explanatory Variables	169
10.3.4	Results	171
10.4	Conclusion	178
	References	179
11	Keeping in Contact with Mobile Sample Members	183
	<i>Mick P. Couper and Mary Beth Ofstedal</i>	
11.1	Introduction	183
11.2	The Location Problem in Panel Surveys	184
11.2.1	The Likelihood of Moving	185
11.2.2	The Likelihood of Being Located, Given a Move	187
11.3	Case Study 1: Panel Study of Income Dynamics	190
11.4	Case Study 2: Health and Retirement Study	196
11.5	Discussion	200
	Acknowledgements	201
	References	202
12	The Use of Respondent Incentives on Longitudinal Surveys	205
	<i>Heather Laurie and Peter Lynn</i>	
12.1	Introduction	205
12.2	Respondent Incentives on Cross-Sectional Surveys	206
12.2.1	Effects of Incentives on Response Rates on Mail Surveys	206
12.2.2	Effects of Incentives on Response Rates on Interviewer-Administered Surveys	207
12.2.3	Effects of Incentives on Sample Composition and Bias	207
12.2.4	Effects of Incentives on Data Quality	208
12.2.5	Summary: Effects of Incentives	208
12.3	Respondent Incentives on Longitudinal Surveys	208
12.4	Current Practice on Longitudinal Surveys	211
12.5	Experimental Evidence on Longitudinal Surveys	218
12.5.1	Previous Experiments on UK Longitudinal Surveys	221
12.5.2	British Household Panel Survey Incentive Experiment	222
12.6	Conclusion	229
	Acknowledgements	230
	References	231

13	Attrition in Consumer Panels	235
	<i>Robert D. Tortora</i>	
13.1	Introduction	235
13.2	The Gallup Poll Panel	237
13.3	Attrition on the Gallup Poll Panel	241
13.3.1	Descriptive Analysis	241
13.3.2	Experiments	244
13.3.3	Logistic Regression	246
13.3.4	A Serendipitous Finding: The Relationship Between Type of Survey and Attrition	246
13.4	Summary	248
	References	248
14	Joint Treatment of Nonignorable Dropout and Informative Sampling for Longitudinal Survey Data	251
	<i>Abdulhakeem A. H. Eideh and Gad Nathan</i>	
14.1	Introduction	251
14.2	Population Model	255
14.3	Sampling Design and Sample Distribution	256
14.3.1	Theorem 1	256
14.3.2	Theorem 2	257
14.4	Sample Distribution Under Informative Sampling and Informative Dropout	257
14.5	Sample Likelihood and Estimation	258
14.5.1	Two-Step Estimation	259
14.5.2	Pseudo Likelihood Approach	259
14.6	Empirical Example: British Labour Force Survey	260
14.7	Conclusions	262
	References	263
15	Weighting and Calibration for Household Panels	265
	<i>Ulrich Rendtel and Torsten Harms</i>	
15.1	Introduction	265
15.2	Follow-up Rules	266
15.2.1	Population Definitions	266
15.2.2	Samples and Follow-up	268
15.3	Design-Based Estimation	269
15.3.1	The Horvitz–Thompson Estimator	269
15.3.2	Link Functions	270
15.3.3	Convexity and Variance of the Weighted Estimator	273
15.4	Calibration	274
15.4.1	Types of Calibration within Panels	275
15.4.2	Bias and Variance	276
15.5	Nonresponse and Attrition	278

15.5.1	Empirical Evidence Regarding Nonresponse and Attrition	278
15.5.2	Treatment via Model-Based Prediction	281
15.5.3	Treatment via Estimation of Response Probabilities	281
15.6	Summary	285
	References	285
16	Statistical Modelling for Structured Longitudinal Designs	287
	<i>Ian Plewis</i>	
16.1	Introduction	287
16.2	Methodological Framework	288
16.3	The Data	290
16.4	Modelling One Response from One Cohort	292
16.5	Modelling One Response from More Than One Cohort	295
16.6	Modelling More Than One Response from One Cohort	297
16.7	Modelling Variation Between Generations	298
16.8	Conclusion	300
	References	301
17	Using Longitudinal Surveys to Evaluate Interventions	303
	<i>Andrea Piesse, David Judkins and Graham Kalton</i>	
17.1	Introduction	303
17.2	Interventions, Outcomes and Longitudinal Data	304
17.2.1	Form of the Intervention	304
17.2.2	Types of Effects	305
17.2.3	Conditions for the Evaluation	305
17.2.4	Controlling for Confounders in the Analysis	306
17.2.5	Value of Longitudinal Surveys	307
17.3	Youth Media Campaign Longitudinal Survey	309
17.4	National Survey of Parents and Youth	311
17.5	Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP)	314
17.6	Concluding Remarks	315
	References	315
18	Robust Likelihood-Based Analysis of Longitudinal Survey Data with Missing Values	317
	<i>Roderick Little and Guangyu Zhang</i>	
18.1	Introduction	317
18.2	Multiple Imputation for Repeated-Measures Data	318
18.3	Robust MAR Inference with a Single Missing Outcome	320
18.4	Extensions of PSPP to Monotone and General Patterns	323
18.5	Extensions to Inferences Other than Means	324
18.6	Example	325

18.7	Discussion	328
	Acknowledgements	330
	References	330
19	Assessing the Temporal Association of Events Using Longitudinal Complex Survey Data	333
	<i>Norberto Pantoja-Galicia, Mary E. Thompson and Milorad S. Kovacevic</i>	
19.1	Introduction	333
19.2	Temporal Order	334
	19.2.1 Close Precursor	334
	19.2.2 Nonparametric Test for Close Precursor	335
19.3	Nonparametric Density Estimation	335
	19.3.1 Kernel Density Estimation	336
	19.3.2 Local Likelihood Approach	337
19.4	Survey Weights	340
	19.4.1 Assessing the Standard Error	341
19.5	Application: The National Population Health Survey	341
	19.5.1 Pregnancy and Smoking Cessation	342
	19.5.2 Subsample	342
	19.5.3 Interval-Censored Times	342
	19.5.4 Results	343
19.6	Application: The Survey of Labour and Income Dynamics	344
	19.6.1 Job Loss and Separation or Divorce	345
	19.6.2 Subsample	345
	19.6.3 Interval-Censored Times	345
	19.6.4 Results	346
19.7	Discussion	347
	Acknowledgements	348
	References	348
20	Using Marginal Mean Models for Data from Longitudinal Surveys with a Complex Design: Some Advances in Methods	351
	<i>Georgia Roberts, Qunshu Ren and J.N.K. Rao</i>	
20.1	Introduction	351
20.2	Survey-Weighted GEE and Odds Ratio Approach	354
20.3	Variance Estimation: One-Step EF-Bootstrap	356
20.4	Goodness-of-Fit Tests	357
	20.4.1 Construction of Groups	358
	20.4.2 Quasi-Score Test	358
	20.4.3 Adjusted Hosmer-Lemeshow Test	360
20.5	Illustration Using NPHS Data	361
	20.5.1 Parameter Estimates and Standard Errors	362
	20.5.2 Goodness-of-Fit Tests	363
20.6	Summary	364
	References	365

21	A Latent Class Approach for Estimating Gross Flows in the Presence of Correlated Classification Errors	367
	<i>Francesca Bassi and Ugo Trivellato</i>	
21.1	Introduction	367
21.2	Correlated Classification Errors and Latent Class Modelling	368
21.3	The Data and Preliminary Analysis	371
21.4	A Model for Correlated Classification Errors in Retrospective Surveys	373
21.5	Concluding Remarks	378
	Acknowledgements	379
	References	379
22	A Comparison of Graphical Models and Structural Equation Models for the Analysis of Longitudinal Survey Data	381
	<i>Peter W. F. Smith, Ann Berrington and Patrick Sturgis</i>	
22.1	Introduction	381
22.2	Conceptual Framework	382
22.3	Graphical Chain Modelling Approach	383
22.4	Structural Equation Modelling Approach	384
22.5	Model Fitting	385
22.6	Results	386
22.7	Conclusions	390
	Acknowledgements	391
	References	391
Index		393