

Contents

<i>List of Experiments</i>	<i>page</i>	<i>xi</i>
<i>Acknowledgements</i>		<i>xiii</i>
<i>Preface</i>		<i>xv</i>
1	Introduction	1
1.1	Assessing the worth of an HCI idea	1
1.2	Experiments: Assessing worth by comparison	3
1.3	Evaluations: Assessing worth by use	4
1.4	Focus of this book	5
1.5	Structure of this book	6
2	Defining the research	8
2.1	The research question	9
2.2	Conditions for comparison	10
2.3	Designing experiments	15
2.4	Generalisability	16
2.5	Experimental objects	18
2.6	Experimental tasks	28
2.7	Experimental trials	36
2.8	Nature of the domain	40
2.9	Evaluations	46
2.10	Summary	50
3	Experimental procedure	51
3.1	Allocating participants to conditions	51
3.2	The experimental process: Defining the participant experience	58
3.3	Pilot experiments	68
3.4	Experimental materials: Software	71

3.5	Additional experimental processes	72
3.6	Practical issues	76
3.7	Ethical approval	87
3.8	Evaluations	91
3.9	Summary	94
4	Data collection and qualitative analysis	95
4.1	The data and the research question	96
4.2	Some principles of qualitative data collection and analysis	98
4.3	Nature of data collected	102
4.4	Collecting a variety of data	111
4.5	Evaluations	112
4.6	Summary	114
5	Statistics	116
5.1	Statistical analysis	116
5.2	Parametric analysis (for normally distributed data)	129
5.3	Nonparametric analysis (for nonnormally distributed data)	141
5.4	Analysis of preference data	154
5.5	Further analyses	159
5.6	Role of qualitative data	176
5.7	Evaluations	177
5.8	Summary	177
6	Reporting	182
6.1	Reviewers' concerns	182
6.2	Justifying design decisions	183
6.3	Presenting results and conclusions	187
6.4	The overall story	190
6.5	Evaluations	191
6.6	Summary	192
7	Problems and pitfalls	193
7.1	Problems	193
7.2	Pitfalls	195
7.3	Evaluations	198
7.4	Summary	198
8	Six principles for conducting experiments	199
8.1	A model of the experimental process	199
8.2	Six key principles for conducting experiments	199
8.3	Concluding remarks	201

Appendix A1 Independent measures examples	203
A1.1 Parametric analysis	203
A1.2 Nonparametric analysis (for nonnormally distributed data)	209
A1.3 Summary	215
Appendix A2 Statistical formulae	216
A2.1 Parametric tests	217
A2.2 Nonparametric tests	222
Appendix A3 Factor analysis example	227
A3.1 Multiway factor analysis	227
A3.2 Selective factor analysis	231
<i>Bibliography</i>	235
<i>References</i>	237
<i>Index</i>	241