

Detailed Contents

List of Figures and Tables	xi
Preface	xiii
Acknowledgments	xvii
About the Authors	xix
1. Introduction	1
1.1 Background	1
1.2 Overview of the Research Process	5
1.3 Overview of the Running Examples	11
1.4 Further Readings	15
1.5 Questions	16
Summary Questions	16
Thought Questions	17
2. Preparation for Running Experiments	19
2.1 Reading Literature in the Area	19
2.2 Preparing the Apparatus and Materials, Design, and Procedure Through Piloting	21
2.2.1 Care, Control, Use, and Maintenance of Apparatus	22
2.2.2 The Testing Facility	26
2.2.3 Choice of Dependent Measures: Performance, Time, Actions, Errors, Verbal Protocols, and Other Measures	28
2.2.4 Plan Data Collection With Analysis in Mind	34
2.2.5 Run Analyses With Pilot Data	36
2.2.6 Write About Your Experiment Before Running	37
2.3 Preparing for Recruiting	37
2.3.1 Choice of a Term: <i>Participants</i> or <i>Subjects</i>	37
2.3.2 Recruiting Participants	39
2.3.3 Subject Pools and Class-Based Participation	41

2.4 Institutional Review Board (IRB)	43
2.4.1 What Needs IRB Approval?	44
2.4.2 Preparing an IRB Submission	46
2.5 Preparing to Run the Low Vision HCI Study	48
2.6 Preparing to Run the HRI Study	52
2.7 Conclusion	53
2.8 Further Readings	54
2.9 Questions	55
Summary Questions	55
Thought Questions	56
3. Potential Ethical Problems	57
3.1 Preamble: A Simple Study That Hurt Somebody	59
3.2 The History and Role of Ethics Reviews	60
3.3 Recruiting Subjects	61
3.4 Coercing Subjects	61
3.5 Risks, Costs, and Benefits of Participation	62
3.6 Sensitive Data	63
3.7 Plagiarism	66
3.8 Fraud	66
3.9 Conflicts of Interest	67
3.10 Authorship and Data Ownership	68
3.11 Interpersonal Conflicts Within a Research Team	69
3.12 Potential Ethical Problems in the Low Vision HCI Study	71
3.13 Potential Ethical Problems in the Multilingual Fonts Study	73
3.14 Conclusion	75
3.15 Further Readings	75
3.16 Questions	76
Summary Questions	76
Thought Questions	76
4. Risks to Validity to Avoid While Running an Experiment	79
4.1 <i>Validity</i> Defined: Internal, External, Construct, and Surface	81
4.2 Risks to Internal Validity	83
4.2.1 Power: How Many Participants?	84
4.2.2 Experimenter Effects	86
4.2.3 Participant Effects	87
4.2.4 Demand Characteristics	88

4.2.5	Equipment and Setup Effects	89
4.2.6	Randomization and Counterbalancing	89
4.2.7	Abandoning the Task	91
4.3	Risks to External Validity	92
4.3.1	Task Fidelity	92
4.3.2	Representativeness of Your Sample	94
4.4	Avoiding Risks in the Multilingual Fonts Study	95
4.5	Avoiding Risks in the HRI Study	96
4.6	Conclusion	97
4.7	Further Readings	97
4.8	Questions	98
	Summary Questions	98
	Thought Questions	98
5.	Running a Research Session	99
5.1	Preparing to Run a Research Session	99
5.1.1	Preparing the Space for Your Study	99
5.1.2	Piloting	102
5.1.3	Experimenter Dress Code	103
5.1.4	Preparing and Using a Script	104
5.1.5	Before Subjects Arrive	104
5.2	Running a Research Session	106
5.2.1	Welcome	106
5.2.2	Talking With Subjects	106
5.2.3	Concluding a Session	108
5.2.4	Running Simulated Subjects	112
5.3	Other Issues	112
5.3.1	Missing Subjects	112
5.3.2	Other Problems and How to Deal With Them	113
5.3.3	Chance for Insights	114
5.4	Running the Low Vision HCI Study	115
5.5	Running the Multilingual Fonts Study	116
5.6	Running the HRI Study	117
5.7	Conclusion	118
5.8	Further Readings	118
5.9	Questions	119
	Summary Questions	119
	Thought Questions	119
6.	Concluding a Study	121
6.1	Data Care, Security, and Privacy	121
6.2	Data Backup	122

6.3 Data Analysis	123
6.3.1 Documenting the Analysis Process	123
6.3.2 Descriptive and Inferential Statistics	124
6.3.3 Planned Versus Exploratory Data Analysis	127
6.3.4 Displaying Your Data	127
6.4 Communicating Your Results	128
6.4.1 Research Outlets	128
6.4.2 The Writing Process	129
6.5 Concluding the Low Vision HCI Study	130
6.6 Concluding the Multilingual Fonts Study	131
6.7 Concluding the HRI Study	132
6.8 Conclusion	133
6.9 Further Readings	133
6.10 Questions	134
Summary Questions	134
Thought Questions	134
Afterword	137
Appendix 1: A Checklist for Preparing Studies	139
Appendix 2: Example Scripts for Running Studies	141
A2.1 A High-Level Script for a Human–Computer Interaction Study	141
A2.2 A More Detailed Script for a Cognitive Psychology Experiment	143
Appendix 3: Example Consent Form	145
Appendix 4: Example Debriefing Form	149
Appendix 5: Example Institutional Review Board Application	151
Appendix 6: Considerations When Running a Study Online	167
A6.1 Recruiting Subjects	167
A6.2 Apparatus	168
A6.3 Gaming Your Apparatus	169
A6.4 Further Readings	169
References	171
Index	179