

# Contents

Contributors	ix
Foreword	xi
Preface	xiii

## Chapter 1 **Movement, Action and Skill**

Mary M. Smyth and Alan M. Wing

1. Introduction	1
2. Describing and Understanding Movement	2
3. Movement and Skill in Psychology	6
4. Movement, Action and Information Processing	10
5. The Rest of This Book	12

## Chapter 2 **Physiology of Motor Control**

Kerry Greer

1. Introduction	17
2. Building Blocks of the Nervous System	18
3. Spinal Mechanisms	22
4. Supraspinal Mechanisms	31
5. Interactions between Components of the Motor System	41
6. Conclusion	45

## Chapter 3 **Planning and Controlling Simple Movements**

Martin R. Sheridan

1. Introduction	47
2. Categories of Movement	50
3. Fitts's Law	54
4. Sources of Information in the Control of Movement	57
5. Theories of Motor Control	60
6. Motor Programs	61
7. Feedback Control	73
8. Movement Variation and Schema Theory	77
9. Conclusion	81

## Chapter 4 **Memory for Movements**

Mary M. Smyth

1. Introduction	83
2. The Short-Term Motor-Memory Paradigm	84
3. Measuring Memory for Simple Movements	87
4. Memory for Constrained Movements	90

5. Interference in Memory	96
6. Active, Passive and Self-Selected Movements	99
7. Sight and Feel in Memory for Movement	106
8. Vision and Subject Control	110
9. Strategies	111
10. Context in Memory for Movement	113
11. Conclusion	115

## **Chapter 5 Perception and Action**

Mary M. Smyth

1. Introduction	119
2. Types of Perceptual Input	120
3. How Many Visual Systems?	122
4. Orientation to the World: Balance and Posture	127
5. Perception and Feedback	131
6. Skilled Perception	142
7. Perceptual Schemas	147
8. Conclusion	151

## **Chapter 6 The Sequencing of Movements**

Gerard van Galen and Alan M. Wing

1. Introduction	153
2. Feedback in Sequencing Movements	154
3. Parameters in the Motor Program	156
4. Levels of Representation of Movement Sequences	163
5. Errors in Movement Sequences	170
6. Conclusion	180

## **Chapter 7 Doing Two Things at Once: Process Limitations and Interactions**

Herbert Heuer and Alan M. Wing

1. Introduction	183
2. Experimental Methods	184
3. Theoretical Approaches to Dual-Task Performance	192
4. The Use of Dual-Task Methodology in the Analysis of Movement Control	202
5. Levels of Interference	211
6. Conclusion	213

## **Chapter 8 The Acquisition of Skill**

Peter Johnson

1. Introduction	215
2. Stages in Skill Acquisition	218

3. Theoretical Accounts of the Learning Process	226
4. Coordinative Structures and Transfer	230
5. Practice	232
6. Conclusion	239

## **Chapter 9 The Development of Movement Control**

Laurette Hay

1. Introduction	241
2. Myelination	242
3. The Developmental Sequence in the First Year	244
4. Reaching	253
5. Conclusion	266

## **Chapter 10 Disorders of Movement**

Alan M. Wing

1. Introduction	269
2. Pathological Changes in the Central Nervous System (CNS)	270
3. Clinical Assessment of Movement	276
4. Empirical Studies of Motor Disorders	282
5. Conscious Representation of Goal-Directed Action	291
6. Conclusion	295

## **Afterword** 297

Glossary	303
References	307
Author Index	327
Subject Index	335