

CONTENTS

Preface **vii** ■ Acknowledgments **ix**

PART I INTRODUCTION TO MOTOR BEHAVIOR 1

CHAPTER 1 Evolution of a Field of Study **3**

 Understanding Movement **4**

 Origins of the Field **5**

 Summary **18**

CHAPTER 2 Methodology for Studying Motor Performance **21**

 Classification of Motor Skills **21**

 Basic Considerations in Measurement **24**

 Measuring Motor Behavior **26**

 Measuring and Evaluating Relationships **48**

 Summary **54**

CHAPTER 3 Human Information Processing **57**

 The Information-Processing Model **57**

 Three Stages of Information Processing **58**

 Anticipation **78**

 Signal-Detection Theory **85**

 Memory **88**

 Summary **93**

CHAPTER 4 Attention and Performance **97**

 Types of Attention **97**

 Theories of Attention **100**

 Competition for Attention **103**

 Attention During Movement **116**

 Focus of Attention **124**

 Attention and Anxiety **127**

 Summary **130**

CHAPTER 5 Sensory Contributions to Motor Control **131**

CHAPTER 6 Motor Control Systems **135**

CHAPTER 7 Principles of Speed and Accuracy **139**

CHAPTER 8 Coordination **143**

CHAPTER 9 Motor Learning **147**

CHAPTER 10 Motor Learning Concepts and Research Methods **151**

Appendix A ■ Glossary ■ References ■ Author Index ■ **155**

Motor Learning Defined ■ **155**

Measuring Motor Learning ■ **155**

About the Authors ■ **155**

PART II MOTOR CONTROL**133**

CHAPTER 5 Sensory Contributions to Motor Control	135
Closed-Loop Control Systems	135
Vision	136
Audition	153
Proprioceptors	153
Proprioception and Motor Control	158
Feedforward Influences on Motor Control	170
Summary	174
CHAPTER 6 Central Contributions to Motor Control	177
Open-Loop Processes	177
Central Control Mechanisms	182
Central Control of Rapid Movements	188
Generalized Motor Programs	208
Summary	221
CHAPTER 7 Principles of Speed and Accuracy	223
Fitts' Law: The Logarithmic Speed–Accuracy Trade-Off	224
The Linear Speed–Accuracy Trade-Off	231
The Temporal Speed–Accuracy Trade-Off	234
Central Contributions to the Spatial Speed–Accuracy Trade-Off	241
Correction Models of the Speed–Accuracy Trade-Off	257
Summary	260
CHAPTER 8 Coordination	263
Discrete Tasks	264
Continuous Tasks	277
Summary	294
CHAPTER 9 Individual Differences and Capabilities	297
Experimental Versus Differential Approaches	297
Abilities	301
Taxonomies	310
Prediction	312
Individual-Difference Variables	315
Summary	324

PART III MOTOR LEARNING**325**

CHAPTER 10 Motor Learning Concepts and Research Methods	327
Motor Learning Defined	327
Measuring Motor Learning	329

Designing Experiments on Learning	335
Alternative Methods for Measuring Learning	338
Issues About the “Amount” of Learning	342
Understanding Learning and Performance Variables	345
Summary	345
CHAPTER 11 Conditions of Practice	347
The Law of Practice	347
Motivation for Learning	351
Verbal Information	353
Perceptual Learning	355
Observational Learning	356
Mental Practice	359
Distribution of Practice	361
Variability of Practice	367
Contextual Interference	371
Part Versus Whole Practice	382
Guidance	386
Principles of Practice Specificity	388
Summary	390
CHAPTER 12 Augmented Feedback	393
Classifications and Definitions	393
Research on Augmented Feedback	395
Evaluating the Effects of Augmented Feedback	398
Knowledge of Performance	400
Knowledge of Results	405
Theoretical Issues: How Does Augmented Feedback “Work”?	424
Summary	427
CHAPTER 13 The Learning Process	429
Characteristics of the Learning Process	429
Closed-Loop Theory	438
Schema Theory	441
Differing Theoretical Perspectives of Motor Learning	446
Summary	456
CHAPTER 14 Retention and Transfer	461
Fundamental Distinctions and Definitions	461
Measuring Retention and Transfer	463
Retention and Motor Memory	467
Retention Loss	471
Transfer of Learning	481
Summary	488
Appendix 491 ■ Glossary 493 ■ References 503 ■ Author Index 565	
Subject Index 573 ■ About the Authors 581	