

CONTENTS

List of illustrations	xi
Acknowledgments	xiii
Introduction: Toward an Understanding of Embodied Cognition	1
Chapter 1 Standard Cognitive Science	7
1.1 Introduction	7
1.2 Newell and Simon's General Problem Solver	7
1.3 Descriptive Frameworks	9
1.4 Back to General Problem Solver	12
1.5 Sternberg's Analysis of Memory Scanning	14
1.6 The Computational Vision Program	20
1.7 The Solipsistic View	26
1.8 Summary	27
1.9 Suggested Reading	27
Chapter 2 Challenging Standard Cognitive Science	28
2.1 Introduction	28
2.2 Gibson's Ecological Theory of Perception	29
2.2.1 Structure in Light	30

2.2.2	The Brain's Role in Vision	35
2.3	Hatfield's Noncognitive Computationalism	37
2.4	The Connectionist Challenge	41
2.5	Summary	48
2.6	Suggested Reading	50
Chapter 3 Conceptions of Embodiment		51
3.1	Introduction	51
3.2	Varela, Thompson, and Rosch: World Building	52
3.3	Thelen: Representation <i>Lite</i>	56
3.4	Clark: Thinking with the Body	61
3.5	Summary	67
3.6	Suggested Reading	69
Chapter 4 Embodied Cognition: The Conceptualization Hypothesis		70
4.1	Conceptualization	70
4.2	Linguistic Determinism	71
4.2.1	The Linguistic Determination of Time Conceptions	72
4.2.2	Sex With Syntax	74
4.3	Concepts and Conceptions	76
4.4	Testing Hypotheses	79
4.5	The Embodiment of Color	81
4.6	Embodiment and Metaphor	86
4.6.1	Putting Lakoff and Johnson's Conceptualization Thesis to the Test	89
4.6.2	Second-Generation Cognitive Science	91
4.7	The Symbol Grounding Problem	95
4.8	The Indexical Hypothesis	98
4.8.1	Perceptual Symbols	98
4.8.2	Affordances	100
4.8.3	Meshing	101
4.8.4	Experimental Evidence for the Indexical Hypothesis: The Action-Sentence Compatibility Effect	102
4.9	Assessing the Indexical Hypothesis	104
4.9.1	Meaningfulness in Amodal Representation	104
4.9.2	Sensibility Judgments	106
4.9.3	Standard Cognitive Science and the Action-Sentence Compatibility Effect	107
4.10	The Body in the Brain	108

4.11	Summary	112
4.12	Suggested Reading	113
Chapter 5 Embodied Cognition: The Replacement Hypothesis		114
5.1	Replacement	114
5.2	Dynamical Systems	116
5.3	Van Gelder's Dynamical Hypothesis	118
5.4	Explaining Watt's Centrifugal Governor	119
5.5	The Dynamics of Cognition	124
5.6	Categorical Perception from a Dynamical Perspective	127
5.7	Do Dynamical Explanations Explain?	133
5.8	Replacement and Robotics	137
5.9	The Case for Representational Skepticism	141
5.9.1	Are There Representations in the Centrifugal Governor?	144
5.9.2	The Argument for Representational Skepticism	149
5.9.3	The "They're Not Representations!" Argument against Representations	154
5.10	Summary	156
5.11	Suggested Reading	157
Chapter 6 Embodied Cognition: The Constitution Hypothesis		158
6.1	Constitution	158
6.2	A Quick Refutation of Constitution? The Argument from Envatment	161
6.3	Sensorimotor Theories of Perceptual Experience	164
6.4	Constituents and Causes	170
6.5	More Than Just a Gesture?	173
6.6	Coupling and Constitution	175
6.7	Extending Cognition Further	178
6.8	The Coupling-Constitution Fallacy	179
6.9	A Parity Argument for Constitution	182
6.10	Against Parity – Meeting The Marks of the Cognitive	184
6.10.1	Mark I: Intrinsic Content	186
6.10.2	Mark II: Causal Processes	189
6.11	Extended v. Embedded Cognition	193
6.12	Whose Action is it Anyway?	197
6.13	Summary	199
6.14	Suggested Reading	200

Chapter 7 Concluding Thoughts	201
7.1 Back to the Decision Tree	201
7.2 Conceptualization and Standard Cognitive Science	202
7.3 Replacement and Standard Cognitive Science	206
7.4 Constitution and Standard Cognitive Science	208
7.5 The Final(?) Score	210
Glossary	211
Notes	221
References	227
Index	235