

## TABLE OF CONTENTS

1	Modules and Modularity	158
2	The Process-Decomposition Approach	159
2.1	Separate modifiability, selective influence, process-specific factors, and functional distinctness	159
2.2	Processes and their measures, pure and composite, and combination rules	159
2.3	Overview of examples and issues	162
3	Decomposing Neural Processes with the Lateralized Readiness Potential	164
3.1	Parallel modules for discriminating two stimulus features	164
3.2	Serial modules (stages) for preparing two response features	167
4	Mental Processing Stages Inferred From Reaction Times	168
4.1	Analysis of the reaction-time data in Ex. 3.2	168
4.2	The method of additive factors	170
4.3	Selectivity of the effect of sleep deprivation	170
5	Sensory and Decision Modules Revealed by Signal-Detection Theory	172
6	Neural Processing Modules Inferred from Brain Activation Maps	175
6.1	fMRI signals as pure measures	175
6.2	The fMRI signal as a composite measure	175
6.3	Modular processes in number comparison	175
6.4	Modular processes for stimulus encoding and response selection	177
6.5	Modular short-term and long-term memory processes in scene perception	180
7	Modular Explanations of Additive Effects: How Strong is the Inference?	183
7.1	Inferences from reaction-time measurements	183
7.2	Inferences from fMRI measurements	184
8	Brief Accounts of Four Additional Examples with Composite Measures	187
8.1	Modular neural processes for perceptually separable dimensions	187
8.2	Evidence for modular spatial-frequency analyzers from the detectability of compound gratings	187
8.3	Modules inferred from multiplicative effects on the accuracy of lexical decisions	189
8.4	Evidence from ERP amplitude for modular processes in semantic classification	190
9	Process Decomposition versus Task Comparison	191
9.1	Comparison of two tactile perception tasks	191
9.2	Donders' subtraction method: Task comparison with a composite measure	192
9.3	Finding the "mechanism of action" of a manipulation	193
10	Transcranial Magnetic Stimulation (TMS) and the Search for Modules	194
10.1	An ideal experiment	194
10.2	Visual search and parietal TMS	195
10.3	Number comparison and rTMS of the angular gyrus	196
10.4	Number comparison and rTMS of the intraparietal sulcus	196
11	Process Decomposition and the Effects of Brain Damage	197
12	Additional Issues	199
12.1	Quantitative versus qualitative task changes	199
12.2	Specialized processors and modular processes	200
12.3	Relation between mental and neural processing modules	200
12.4	Differential influence as a criterion for modularity	200
12.5	Factorial experiments: Verification plus discovery	201
12.6	Implications of brain metabolism constraints	201
13	Conclusion	201
	Related Discussions	202
	Author Note	202
	Abbreviations Glossary	203
	References	204