

Contents

Introduction

Neural Correlates of Thinking	3
Eduard Kraft, Balázs Gulyás, and Ernst Pöppel	

Part I The Methods: State of the Art and Prospects

Functional MRI Limitations and Aspirations	15
Peter A. Bandettini	

Studying Cognition with Positron Emission Tomography	39
Alain Dagher	

Investigating the Neural Correlates of Percepts

Using Magnetoencephalography and Magnetic Source Imaging	51
Thomas Hartmann, Nathan Weisz, Winfried Schlee, and Thomas Elbert	

EEG and Thinking	65
Michael Öllinger	

Near-Infrared Spectroscopy for Studying Higher Cognition	83
Yoko Hoshi	

Integration of EEG and fMRI	95
Christoph Mulert and Ulrich Hegerl	

Part II Neural Correlates of Key Components of Higher Cognition

The Neural Implementation of Working Memory	109
Oliver Gruber	

Current Perspectives on Imaging Language	123
Joseph T. Devlin	
Functional Neuroimaging and the Logic of Conscious and Unconscious Mental Processes	141
Balázs Gulyás	
Knowledge Systems of the Brain	175
Josef Ilmberger	
Neural Representation of Time and Timing Processes	187
Elsbieta Szélag, Joanna Dreszer, Monika Lewandowska, and Aneta Szymaszek	
Part III From Conceptual Considerations to Neural Correlates	
Fractionating the System of Deductive Reasoning	203
Vinod Goel	
Human Thought and the Lateral Prefrontal Cortex	219
Kalina Christoff	
Neural Correlates of Insight Phenomena	253
Jing Luo, Gunther Knoblich, and Chongde Lin	
Brain-Based Mechanisms Underlying Causal Reasoning	269
Jonathan Fugelsang and Kevin N. Dunbar	
Index	281