

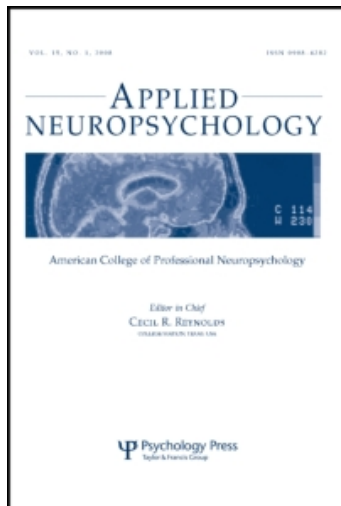
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A Review of: “Koziol, L. F., & Budding, D. E. (2009). *Subcortical Structures and Cognition: Implications for Neuropsychological Assessment.*”

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BOOK REVIEW

Koziol, L. F., & Budding, D. E. (2009). *Subcortical Structures and Cognition: Implications for Neuropsychological Assessment*. New York, NY: Springer. ISBN: 978-0-387-84868-6, 405 pp.

This book represents a solid attempt to illustrate the fact that subcortical brain structures play a crucial role in cognition. As stated in the Preface, neuropsychologists frequently consider cognition to be exclusively related with cortical activity but, indeed, contemporary evidence has demonstrated that subcortical structures not only participate in motor activity—as traditionally interpreted—but also in emotion and cognition. Indeed, cognition depends on integrated cortical–subcortical activity.

The book includes 12 chapters, logically organized, that progressively develop the idea that human cognition is associated with an integrated brain activity, including not only the cerebral cortex but also subcortical structures. This point of view is shared by different leading contemporary researchers in cognitive neurosciences who argue that cognition depends on frontal–subcortical circuits (e.g., Cummings, 1993).

Chapter 1 introduces the idea that the brain is vertically organized and cognition depends on cortical–subcortical circuits; the authors illustrate the so-called frontal–subcortical circuit (frontal cortex, striatum, globus pallidus/substantia nigra, thalamus), and the cerebro–cerebellar circuit (cerebral cortex, pontine nuclei, cerebellar cortex, red nucleus, thalamus). The authors propose that cognition (and also emotion) can be understood as an extension of the motor control systems.

Chapter 2 examines the role of basal ganglia in behavior. Different cerebral pathways are reviewed, and it is emphasized that the basal ganglia participate in learning. At the end of the chapter it is pointed out that basal ganglia abnormalities have been implicated in a variety of psychiatric and developmental disorders, including attention deficit disorder, obsessive–compulsive disorder, and schizophrenia.

Chapter 3 describes the basic frontal–subcortical circuits, emphasizing the dorsolateral prefrontal circuit, orbitofrontal circuit, and medial frontal circuit. It is

emphasized that current neuropsychological tests basically tap the dorsolateral prefrontal circuit, whereas abnormalities in the other two frontal circuits are usually inferred from behavioral observations.

Chapter 4 is entirely devoted to analysis of the participation of basal ganglia in learning, and chapter 5 examines the functional anatomy of the cerebellum and the different theories of cerebellar function. The authors propose that behaviors have three brain-related sources of input and variability: the cortex, the basal ganglia, and the cerebellum.

The following chapter (chapter 6) analyzes language functioning and social cognition. The distinction of a dual system is proposed (stimulus-based processing and higher-order control) depending upon different neuroanatomical structures and different types of learning (declarative–procedural). Chapter 7 (“The Vertically Organized Brain in Clinical Syndromes”) emphasizes that the categories described in the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2000) are not anatomically organized and there are no disorders that implicate only one brain region. Further in the chapter an analysis of different clinical conditions, including obsessive–compulsive disorder, attention deficit hyperactivity disorder, schizophrenia, autism spectrum disorders, mood disorders, and Alzheimer’s disease, is presented.

The following four chapters are devoted to assessment issues. Chapter 8 reviews three functions of the frontostriatal system: assessing the stimulus-based characteristics of novel problem solving, selection of an appropriate stimulus-based behavior, and automatic solutions to problems that were initially novel. Current neuropsychological assessment only partially taps these functions. Diverse tasks that are subserved by the frontostriatal system are further reviewed. Chapter 9 reviews the concept of procedural learning in neuropsychology. The following two chapters are particularly important: chapter 10 refers to the approaches to be used for evaluating the frontostriatal system and chapter 11 reviews the question of neuropsychological testing in cerebellar deficits; in both chapters illustrative examples are presented.

The final chapter presents some general conclusions from the theoretical and clinical points of view. The authors emphasize that a cortical model of cognition is no longer tenable; theoretical interpretations of brain organization of cognition have to integrate basal ganglia and cerebellar contributions; by the same token, interpretation of clinical disturbances has taken into consideration this integrated activity of the brain.

This is a well-written book, integrating an extensive body of research and presenting different original proposals; it includes an extensive and updated literature review, and it is highly recommended not only to clinical neuropsychologists but to other behavioral neuroscientists interested both in theoretical and clinical issues.

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REFERENCES

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders: DSM-IV-TR*. Washington, DC: Author.
- Cummings, J. L. (1993). Frontal-subcortical circuits and human behavior. *Archives of Neurology*, 50, 873–880.