
BOOK REVIEWS

Neuropsychological Assessment IV: A Moderate (Not-So-Extreme) Makeover of an Old Friend

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Neuropsychological Assessment, Fourth Edition. Muriel D. Lezak, Diane B. Howieson, and David W. Loring, with H. Julia Hannay and Jill S. Fischer. 2004, New York: Oxford University Press. 1016 pp., \$89.50 (HB).

Reviewed by RUSSELL M. BAUER, Ph.D., ABPP, *Department of Clinical and Health Psychology, University of Florida, Gainesville, FL*

When I was in my 3rd year of graduate school, I became interested in neuropsychology and purchased the first (1976) edition of Muriel Lezak's *Neuropsychological Assessment* to help prepare for my qualifying examination. It was the first neuropsychology book I ever owned and it was one of the few textbooks I have ever read from cover to cover. *Neuropsychological Assessment* is one of the classics in the field of clinical neuropsychology. It and the subsequent three editions of this classic have both reflected and shaped the field it represents. The book, often referred to as "Lezak," is without question *the* most widely-consulted source on neuropsychological assessment as a clinical enterprise. The fourth edition continues in the great tradition of its predecessors, except that the sheer scope and magnitude of current work in neuropsychological assessment has now made an exhaustive and inclusive review of available tests impossible. As indicated in the preface, the revised goal of "Lezak IV" is to provide a "broad but necessarily and selectively restricted range of the information that is currently relevant and necessary for understanding and undertaking neuropsychological assessment."

The content and organization of the book remains the same as in previous editions. However, in the fourth edition, Lezak, who on her last three tours was a solo performer, has commissioned a distinguished band of colleagues to enrich and deepen the overall tenor of the work this time around. The primary co-authors (Diane B. Howieson, David W. Loring) are distinguished neuropsychologists with established track records as scientists and practitioners in the field. Their contributions are visible in what amounts to significant reworking and updating of the introductory chapters. Two additional co-authors (H. Julia Hannay and Jill S. Fischer), themselves well-known for their clinical and research work, make more limited but valuable contributions. Their contributions are noted by

authorship designations on selected chapters, while the two primary co-authors have made contributions to all chapters in the book. This ensemble of co-authors enriches the book's content by reflecting a broader and more complete accounting of the empirical basis of practice and of the conceptual foundations of neuropsychological test interpretation.

As happens to many of us, the book has gotten heavier and larger as time has passed. The newly-released fourth edition is 1016 pages long, actually shorter by 10 pages than the third edition, but the size of the book has increased to 8" × 11" and the primary font has been reduced to the point where reading glasses are advised! Readers who have owned previous editions will recognize the familiar organization that has characterized previous editions. The book begins with eight chapters under the broad heading of "Theory and Practice of Neuropsychological Assessment." Several of these chapters have been extensively re-written though the basic organization, even down to the subhead level, is largely unchanged. Overall, chapters in this section are more extensively referenced and comprehensive than before, though it still has the feel of a brief helicopter ride over the complex landscape of neuropsychological assessment rather than an in-depth analysis of critical issues. The extensive referencing occasionally makes for choppy reading, but the real value of the book is not in its prose but in its stature as a beginning roadmap to the field. I have always viewed *Neuropsychological Assessment* as a good "entry point" for finding basic test materials and clinical references to begin a process of further study, but I have typically relied on original sources, rather than on Lezak itself, to bolster substantive points in clinical assessments or manuscripts. This opinion has not changed with the publication of the fourth edition. In fact, the addition of a greater amount of introductory material, and more extensive links to the

empirical literature, may make it even more important to have more than just passing knowledge of neuropsychology and assessment in order to benefit from the reviews found here.

The real “meat” of the volume, the “Compendium of Tests and Assessment Techniques” takes up the final 11 chapters, ordered in precisely the same way as in previous editions. It is hard to find fault with the impressive, broad coverage of major instruments, inventories, and approaches to neuropsychological assessment that is offered here. Again, however, readers should be prepared to consult original sources for the kind of extensive normative, psychometric, or descriptive data they will need to actually implement specific instruments in their practice. As the authors themselves indicate, advancements in the field are occurring so rapidly that some sections are already out of date. This is probably unavoidable with a book of this size and scope, but readers should take heart that they get excellent initial bearings on the assessment landscape from the descriptions offered in the compendium. On occasion, I found myself wanting more critical in-depth analysis of the strengths and weaknesses of various measures, but overall the balance between breadth and depth of coverage is excellent. Many sections are greatly improved over previous editions. As a prominent example, the final chapter, previously entitled,

“Testing for Functional Complaints,” is now entitled “Testing for Response Bias and Incomplete Effort,” and contains a dramatically expanded discussion of techniques and concepts in this important area. However, since effort research is exploding, the reader should understand that much new work has taken place since the book went to production.

Despite this issue, the reference list alone is almost worth the price of admission. It spans 189 pages and makes much better contact with the medical and experimental literatures than did previous editions. Also included is a test index, which allows the reader to directly access the description of individual instruments. The author index has been dropped, apparently due to the fact that many authors would have been listed so numerous that its usefulness would have been diminished.

In addition to showing the added weight and girth of advancing age, *Neuropsychological Assessment IV* is thus in many respects wiser than its predecessors. Its value as a reference to be used regularly by professionals and trainees alike is undisputed. Some of us have had one or another version of Lezak in active use in our offices for almost 30 years. The book has been made over again, extensively though not extremely. Overall, the results are well worth making a new, extended visit to our old friend to check out the “new look.”

A 21st Century View of Asymmetry in the Human Brain

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The Asymmetrical Brain. Kenneth Hugdahl and Richard J. Davidson (Eds.). 2003. Cambridge, MA: The MIT Press. 796 pp., \$90.00.

Reviewed by ANNE L. FOUNDAS, M.D., *Department of Psychiatry and Neurology, Tulane University Health Sciences Center, New Orleans, LA.*

One of the most fundamental questions in cognitive neuroscience relates to the biological basis of functional hemispheric specialization and the relationship of structure to function. These important and controversial concepts are reviewed in *The Asymmetrical Brain*. Drs. Hugdahl and Davidson have selected core topics discussed by an impressive group of internationally recognized experts. This text was originally conceived as an update to the 1995 book *Brain Asymmetry* edited by Hugdahl and Davidson, but this text offers a completely reorganized approach to the topic that is both timely and comprehensive within a narrow focus on specific neural systems and neural syndromes. This book will appeal to students and experts in the broader field of human cognitive neuroscience and should be required reading to anyone with an academic interest in cerebral laterality and human cognition. Indeed, the field has advanced since 1995, and this book will surely become a major impetus to future research advancement in brain laterality.

This book has a total of 21 chapters contributed by 40 authors from six countries. These chapters are divided into

seven sections that together provide a comprehensive exploration of a variety of complementary topics in cerebral laterality. The sections are: Section I—Animal Models/Basic Function, Section II—Neuroimaging and Brain Stimulation, Section III—Visual Laterality, Section IV—Auditory Laterality, Section V—Emotional Laterality, Section VI—Neurological Disorders, Section VII—Psychiatric Disorders. The first two sections include chapters that review background concepts (e.g., visual systems in birds—Chapter 1, determinants of hand preference—Chapter 4) and methodologies (neuroimaging and cortical stimulation) used to study brain asymmetry. The next three sections are devoted to specific neural systems (visual, auditory, and emotional processing). The final two sections shift to neurological and psychiatric disorders. The content of these individual sections will be briefly discussed below.

The first section, Animal Models and Basic Functions, presents background theoretical and conceptual models from animal and human studies. The chapters in this section review important core topics, and present some newer evolving con-

cepts that are likely to facilitate future empiric studies. The first chapter is a very stimulating and comprehensive discussion of avian visual laterality by Onur Güntürkün who systematically demonstrates that animal models can inform about human laterality. Avian visual asymmetries develop within a critical period due to interplay of genetic and epigenetic factors that impact ascending visual pathways that become wired in a lateralized manner. The first section also includes a very interesting chapter by Akaysha Tang that presents a hippocampal theory of cerebral lateralization that is largely based on animal experiments that support the notion that brain asymmetry may be linked to experience-dependent mediation of anatomy and neurochemistry (Chapter 2). The asymmetry of dopamine efferents within prefrontal cortex is discussed in Chapter 3 with reference to stress and anxiety. Basic anatomy of these prefrontal circuits is reviewed with an emphasis on the interaction of prefrontal circuits with the hypothalamic-pituitary-adrenal axis and the amygdala. Finally, Chapter 4, by Alan Beaton, is a comprehensive review of our current understanding of the nature and heritability of handedness. Dr. Beaton discusses theories of handedness with an historical perspective that is advanced by his presentation of older and newer models including the testosterone model, the developmental instability model, and the role of learning. All of these chapters stand alone, but are woven together in a way that provides the reader with an idea of the complex interplay of many factors that ultimately effect human laterality and result in the range of individual differences in human behavior.

The second section of *The Asymmetric Brain* provides an overview of the contributions of neuroimaging and brain stimulation studies to our understanding of brain laterality. Tremendous progress has been made in the past thirty years with the greatest advances attributable to the technology which allows us to visualize the human brain *in vivo*. The merging of technology with computer-based imaging techniques has rapidly moved the field of neuroscience forward in the past thirty years. Imaging techniques include the study of cellular and subcellular elements *in vitro* to optical imaging of neuronal activity to imaging the whole brain in humans and non-human primates during cognitive operations. Cognitive neuroscience research is being driven by dramatic advances in neuroimaging methods, including structural and functional magnetic resonance imaging (MRI), and positron emission technology (PET). Structural details of the brain can be reconstructed using non-invasive methods (structural magnetic resonance imaging-MRI). Cognitive functions, such as learning and memory, language, attention and emotion, can be studied by analyzing subtle, task-related changes in cerebral blood flow (functional MRI). The timing of neural activity can be studied using cortical event related potentials (ERPs). It is important to examine the application of these advanced techniques to our understanding of human cerebral laterality. This section includes chapters that characterize functional asymmetries with brain mapping (Chapter 5), anatomical brain asymmetries with an emphasis on human brain structure and function (Chapter 6), and transcranial mag-

netic stimulation studies of asymmetrical cognitive functional reactivity in the human brain (Chapter 7).

The next three sections in the book shift the emphasis to specific neural systems including: Visual laterality (Section III), Auditory laterality (Section IV), and Emotional laterality (Section V). Section three explores visual laterality in three chapters that probe interhemispheric interactions and processing capacity (Chapter 8), spatial relations (Chapter 9), and issues of hemispheric transfer in sensorimotor tasks based on ERP studies. Section four examines auditory laterality in three chapters including the processing of tonal stimuli (Chapter 11), dichotic listening studies (Chapter 12), and the effects of attention (Chapter 13). Section five reviews emotional processing and laterality in three chapters that discuss cortical and subcortical circuitry (Chapter 14), regional brain activity in anxiety and depression (Chapter 15), and the state and trait nature of frontal electroencephalographic (EEG) asymmetry in emotional processing (Chapter 16). Once again each of these chapters stands alone, but taken together the information provided in these sections gives the reader a comprehensive overview of the complex nature of these neural systems and the pertinent issues of cerebral laterality in visual, auditory, and emotional processing.

Finally, the last two sections of the book shift to discussions of specific neurological (Section VI) and psychiatric (Section VII) disorders. In the section on neurological disorders, cognitive and sensorimotor deficits and compensatory strategies associated with agenesis of the corpus callosum are discussed in Chapter 17. Dyslexia is the basis of discussions in Chapters 18 and 19. The former chapter reviews neuroanatomical studies that purport that dyslexia may be associated with a variety of neural risk factors, and the latter chapter further elaborates on the discussion of some of these brain asymmetries in left-handers and in individuals with dyslexia. The section on psychiatric disorders includes two chapters. The first chapter discusses behavioral, physiological and neuroimaging findings in depressive disorders (Chapter 20). The final chapter presents a view of laterality issues in schizophrenia (Chapter 21).

In summary, *The Asymmetric Brain* is an outstanding contribution to the field of human brain anatomy and function. This rapidly evolving field of cognitive neuroscience is covered in a focused and comprehensive way in this edited text. Clinicians, educators and researchers in the field of human cognition and cerebral laterality look forward to future advances that will allow the more precise mapping of cognitive, emotional and sensorimotor systems onto the landscape of the human brain. Fields such as molecular imaging and gene therapy represent only two evolving fields that will allow us to advance our understanding of the brain and behavior. Researchers need to directly probe the potentially important relationships between brain morphology, behavior, and genetic susceptibility to neural syndromes that may converge on some cognitive, behavioral, neuroanatomical and neurophysiological measures and diverge on others. We look forward to advances in the field and to other volumes that discuss the basic issues that result in brain asymmetries.

Appreciating the Neurocognitive and Neuropsychiatric Impact of Movement Disorders

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Mental and Behavioral Dysfunction in Movement Disorders. Marc-André Bédard, Yves Agid, Sylvain Chouinard, Stanley Fahn, Amos D. Korczyn, and Paul Lespérance (Eds.). 2003. Totowa, NH: Humana Press, Inc. 561 pp., \$185.00 (HB).

Reviewed by J. VINCENT FILOTEO, Ph.D., Associate Professor in Residence, Department of Psychiatry, University of California, San Diego, and VA San Diego Healthcare System

Disorders having an impact on subcortical brain structures, such as Parkinson's disease, Huntington's disease, and progressive supranuclear palsy (to name a few), have long been known to disrupt basic motor functions. We have also come to understand, however, that these diseases result in cognitive and psychiatric alterations. Many of these cognitive and psychiatric changes are often unrelated to the motor abnormalities seen in these diseases, highlighting the multi-faceted processes mediated by different subcortical structures. In addition, these cognitive and behavioral changes can be more debilitating than the movement deficits experienced by these patients. Thus, it is imperative that clinicians further understand the characteristics of, and treatment options for, these types of symptoms. Further, our understanding of the mental and behavioral changes in these diseases has also informed us about the role of the subcortical brain structures (and their connections) in cognition and psychiatric functioning. From this work, it has become increasingly clear that frontal-subcortical pathways play an important (if not central) role in directing human activity.

In their edited book, *Mental and Behavioral Dysfunction in Movement Disorders*, Bédard, Agid, Chouinard, Fahn, Korczyn, and Lespérance, have assembled chapters highlighting these issues. The book is organized into six major sections (after an introductory chapter that provides a historical perspective), entitled *Mental Processing in the Motor Structures of the Brain*, *Cognition in Movement Disorders*, *Neurophysiology of Cognition in Movement Disorders*, *Dementia in Movement Disorders*, *Neuropsychiatric Aspects of Movement Disorders*, and *Quality of Life in Parkinson's Disease*. In his preface, Dr. Bédard states that one of the major aims is to "provide the reader with an authoritative account of the recent developments in the field set against a background of review material". In short, the book has met this general aim admirably.

The chapter on the historical issues pertaining to Parkinson's and Huntington's disease (by Goetz) offers a nice backdrop to the book by discussing some of the more important historical questions that have been addressed in the study of these diseases including many which have not been completely answered and therefore are still important today. This chapter serves as an overview of issues that still need to be addressed.

In the section *Mental Processing in the Motor Structures of the Brain*, 4 chapters are included that address the role of the basal-ganglia in different aspects of cognition from a biological perspective, such as how the efferent and afferent connections of the basal ganglia influence cognition (by Middleton), the role of ventral, central, and dorsal aspects of the striatum in various aspects of behavior (by Haber), basal ganglia-cortical connections and habit learning (by Graybiel and Kubota), and the role of the cerebellum in cognition and emotion (by Schmahmann). This latter chapter was especially useful given that many books on subcortical disorders tend not to include information on cerebellar contributions to cognition.

In the next section of the book, *Cognition in Movement Disorders*, the 6 chapters include excellent reviews on the assessment of cognition in patients with movement disorders (by Stout and Paulsen), impairments in intention in patients with Parkinsonism (by Brown), the involvement of frontal and subcortical structures in cognitive control (by Richer and Chouinard), language deficits in Parkinson's disease (by Cohen), apraxia in corticobasal degeneration (by Leiguarda), and neuropsychological deficits in patients with cerebellar disorders (by Ackermann and Daum). This section of the book is unique in comparison to other books on subcortical disorders in that topics such as intention, cognitive control, and apraxia were included.

In the section entitled *Neurophysiology of Cognition in Movement Disorders*, 5 chapters address such interesting topics as cognition in animal models of Huntington's disease (by Palfi, Brouillet, Condé, and Hantraye) and Parkinson's disease (by Schneider), the role of catecholamines in cognition (by Robbins, Crofts, Cools, and Roberts), the role of neurotransmitter systems in cognition other than dopamine in Parkinson's disease (by Bédard, Lévesque, Lemay and Paquet), and the cognitive impact of various neurosurgical procedures in Parkinson's disease (by Saint-Cyr). Each of these chapters is excellent, providing very thoughtful discussions as to how the underlying neurophysiological deficits in movement disorders might contribute to the cognitive impairments in these diseases, and importantly, what implications such findings might have for treatment.

The next section provides several excellent chapters about *Dementia in Movement Disorders*, including an overview

of dementia in movement disorders (by Kertesz), a discussion of neuropathological overlap among movement disorders resulting in dementia (by Jellinger), the contributions of synuclein and tau pathologies to dementia (by Hardy), epidemiology and risk factors for dementia in Parkinson's disease (by Levy and Marder), comparisons of neuropsychiatric correlates of dementia in patients with and without dementia (by Ballard and Thomas), neurotransmitter deficiencies underlying psychiatric problems in patients with dementia with Lewy Bodies (by Perry, Piggott, Johnson, Ballard, McKeith, Perry, and Burn), and pharmacological treatment options for dementia in Parkinson's disease (by Korczyn and Giladi).

The section entitled *Neuropsychiatric Aspects of Movement Disorders* contains 13 chapters. This section includes chapters on the role of globus pallidus circuitry in mood disorders (by Lauterbach), cortical-limbic circuitry involvement in depression (by Stefurak and Mayberg), the spectrum of agitation and apathy in movement disorders (by Litvan and Kulisevsky), treatment of depression in Parkinson's disease (by Kostic, Stefanova, Dragasevic and Potrebic), treatment of hallucinations in Parkinson's disease (by Aarsland and Larsen), sleep disturbances associated with movement disorders (by Boeve, Silber, Ferman, Parisi, Dickson, Smith, Lucas, and Petersen), psychogenic movement disorders (by Sa and Lang), treatment of psychosis and mood changes in Huntington's disease (by Guttman, Alpay, Chouinard, Como, Feinstein, Leroi, and Rosenblatt), treatment of aggression and frontal lobe symptoms in Huntington's disease (by Rosenblatt, Anderson, Goumeniouk, Lespérance, Nance, Paulsen, Ruben, Saint-Cyr, Sethna, and Guttman), mood alterations in Tourette

Syndrome (by Robertson), pathophysiology in Tourette syndrome (by Leckman), pathophysiological changes in Obsessive-Compulsive Disorder (by Farchione, MacMillan, and Rosenberg), and movement abnormalities in patients with schizophrenia (by Bocti, Black, and Waddington). This section will be most helpful to clinicians who are involved in the diagnosis and treatment of psychopathology in movement disorders. The majority of the chapters in this section provide up-to-date information regarding treatment options.

The final section entitled *Quality of Life in Parkinson's Disease* provides several excellent reviews on often-neglected topics. Chapters in this section address medical and psychosocial correlates of quality of life in those with Parkinson's disease (by Schrag and Selai), sexual functioning (by Bronner, Royter, Korczyn and Giladi), sleep disorders (by Rye, Daley, Freeman and Bliwise), and the progression of the disease and life expectancy (by Poewe).

Overall, I highly recommend this book to anyone interested in movement disorders, no matter in what area the potential buyer might work. *Mental and Behavioral Dysfunction in Movement Disorders* will be of interest to clinicians who need a quick reference to options for treating dementia and psychopathology in these patients. This book will also be of interest to researchers who have a general interest in the role of the basal ganglia in cognition and behavior. The only minor criticisms I have about this book is that the roles of the basal ganglia in other aspects of cognition (e.g., memory) were not included and that there was some overlap among the chapters, which might be expected given how related are many of these chapter topics. These issues, however, are minor. In short, this is an excellent book.