
BOOK REVIEWS

A Theory of the Neural Basis for Language Functioning

Language, Thought, and the Brain. T. Glezerman and V. Balkoski. 1999. New York: Kluwer Academic/Plenum Publishers. 331 pp., \$79.50 (HB).

Reviewed by MURRAY GROSSMAN, *Department of Neurology, University of Pennsylvania, Philadelphia.*

In this ambitious and densely written volume, Glezerman and Balkoski attempt to present their theory of the neural basis for language and thought, and provide evidence from the literature to support their model. Their model is based on a neurobehavioral analysis of movement by the Russian physiologist Nicolai Bernstein. He proposed “horizontal” (intrahemispheric), “vertical” (hierarchical), and interhemispheric principles of brain organization that Glezerman and Balkoski have applied to the cerebral organization of language. Bernstein’s basic model is described in detail in the first chapter of the book. The subsequent four chapters each consider a specific brain region and a related aspect of language and thought. Each of these chapters begins with a description of the relevant neuroanatomy. The authors then review the cognitive processes and knowledge that this brain area supports. Each chapter then considers the relevant form of aphasia that emerges following insult to the area under discussion. For example, the second chapter is concerned with temporal–occipital cortices and the role of this brain region in visual object perception, thought, and the meanings of individual words. After describing the regional anatomy, the authors characterize their perspective on object perception and how the breakdown of this process can lead to visual agnosia. Glezerman and Balkoski then relate this to the cerebral organization of word meaning and to disorders of naming. Chapter 3 is concerned with lateral temporal cortex and phonologic representations of words. The authors discuss the sound codes of a word, and how this coding process can break down following insult to this area to produce a form of lexical phonological aphasia. The fourth chapter describes the parietal–occipital region of the brain and the role of spatial perception in word forms. Lexical morphological aphasia is the language disorder that results from insult to this brain region. Chapter 5 reviews the fron-

tal brain regions, and the contribution of these areas to sentence processing. The authors discuss two forms of syntactic aphasia that can follow insult to the frontal regions of the brain. In the first of two concluding chapters, Glezerman and Balkoski discuss the implications of their theory for the neurolinguistic classification of aphasia and the disturbance of thought following focal brain damage. The second, concluding chapter presents the implications of their theory for psychiatric diseases such as schizophrenia.

One clear strength of this book is its hypothesis-driven nature. The authors have a theory that they are advocating, and each section of the book treats its subject matter in a manner that tests their hypothesis for the subject under discussion. Another important strength of the book is its strongly neuroanatomic base. Contemporary cognitive neuroscience has become increasingly interested in relating our neuroanatomic knowledge to linguistic and psychological processes. It is important that each section of the book is tightly linked to a specific brain area, and the histologic anatomy and connectivity pattern of this region is reviewed in a fashion that is tied closely to the behavior under discussion. Shortcomings of the book include that it is heavily reliant on historical, Soviet era observations of patients with focal brain injuries, and the approach to these observations that has been disseminated most widely in the West by the great behavioral neurologist Alexander Luria. There is scant consideration of modern techniques such as functional neuroimaging, cognitive evoked potentials, and magnetoencephalography. Moreover, pressing issues central to current neurolinguistic research have been addressed only in passing. For example, the neural basis for category-specific knowledge has been mentioned briefly, and the potential role of working memory in sentence processing has not been seriously considered.

From Theory to Application

Attention and Performance–XVII: Cognitive Regulation of Performance: Interaction of Theory and Application. D. Gopher and A. Koriat (Eds.) 1999. Cambridge, MA: MIT Press. 814 pp., \$95.00.

Reviewed by RONALD A. COHEN, Ph.D., Associate Professor, Department of Psychiatry and Human Behavior, Brown University School of Medicine and Director of Neuropsychology, The Miriam Hospital, Providence, RI.

Neuropsychology owes much to the pioneering efforts of researchers in cognitive psychology. Theory and methods derived from the cognitive sciences have provided an important foundation for neuropsychology. The *Attention and Performance* series has been at the vanguard of cognitive psychology, both chronicling major developments in cognitive science that emerged over the past half century, and catalyzing new directions in cognitive theory, method, and application. Most students of psychology can probably recall some time during their undergraduate or graduate studies, pulling from university library shelves, one of the earlier volumes of this series, as they prepared a term paper, thesis, or research project. The 17th volume of *Attention and Performance* of this edited series was the product of the proceedings of the International Association for the Study of Attention and Performance, held in Haifa, Israel, 30 years after the first edition in 1966. Reviewing the topics covered in the earlier editions, one is struck by the extent to which this series has both mirrored current direction and anticipated shifts in the paradigms of cognitive science.

The focus of the current volume is cognitive regulation. Particular emphasis is given to the application of theory and methods to study and explain processes involved in the regulation of cognition and attention applied to everyday occupational, educational, and clinical problems. Accordingly, this volume is somewhat of a departure from earlier volumes. In many respects, it moves away from some of the efforts of the several volumes that preceded it to integrate neuroscience into cognitive theory. The current volume takes a “top-down” perspective in which high level cognitive systems exert control over lower order processes. The approach here is justified by the goal of “bridging the gap between theory and application.” The overriding theme of this volume, cognitive regulation, has direct implications for current theories of executive control, and therefore should be of considerable interest to neuropsychologists.

In the introduction, Gopher and Koriat provide a cogent argument for the need to bridge cognitive theory and application, emphasizing the importance of “control processes” in real world situation, while acknowledging the challenge of avoiding the old idea of a homunculus responsible for executive control. The introduction (Section 1) is followed by the Association Lecture (Section 2) given by David Meyer and David Kieras, in which their Executive Process Interactive Control (EPIC) computation model of human

multiple-task performance is described. Subsequent sections of the book include (3) “Presentation and Representation of Information,” (4) “Cognitive Regulation of Acquisition and Performance,” (5) “Consciousness and Behavior,” (6) “Special Populations: Aging and Neurological Disorders,” and (7) a discussion of theory and application in the cognitive regulation of performance by Raymond Nickerson.

The lead chapter by Meyer and Kieras, which discusses the EPIC model, is interesting and useful. Past efforts to develop practical unified theories of cognition and action are reviewed, along with potential constraints that need to be addressed and pitfalls to be avoided. These lessons may be useful for neuropsychologists studying executive functions. The computational approaches that are discussed are also informative. Subsequent sections of the book deal with a variety of topics of relevance to executive control of multiple task performance. Section 3 addresses the way in which information from the outside world interfaces with cognitive systems (presentation) and results in a representation, including an interesting discussion about why people are able to classify even novel visual information easily that is very difficult for machines (chapter 3). Wickens provides a fascinating account of how humans modify their spatial frame of references when navigating through space (chapter 4). Other chapters present a variety of topics dealing with the interaction of environmental input with cognition, including a discussion by Moray of the role of mental models in determining what information is attended to. Section 4 deals with regulation of memory acquisition and performance and covers a variety of topics: (1) metamemory, (2) individual differences in adaptation to changing demands in everyday task performance, the influence of (3) incentives and (4) strategy, and (5) executive control for the development of automaticity and complex skill learning in applied settings. Section 5 addresses the complex and fascinating question of how consciousness and self-awareness serve as control processes for behavior, including (1) distinguishing between self-perceived and actual competence (Bjork); (2) evidence that automatic processes create response biases; (3) children’s use of metamemory to facilitate performance; and (4) the use of subjective information as a heuristic for decision making. Chapter 19 examines the use of cognitive interview techniques to probe knowledge in the context of witness recollection in legal contexts, while

the final chapter addresses “time stress” associated with the subjective experience of waiting.

Clinical neuropsychologists would probably find Section 7 of greatest interest, as it addresses attention and performance in “special populations.” Craik and Anderson provide excellent review of normal age-related changes in attention and performance, including generalized slowing. Other topics cover (1) training of executive control skills as people age, (2) the influence of circadian arousal and age effect on inhibitory control, (3) compensatory and noncompensatory mechanisms in the recovery of unilateral neglect (by Ian Robertson), (4) evidence for separate mechanisms for reactive, volitional and memory-guided saccadic eye movements, and (5) a single case study of “neglect dyslexia” demonstrating the role of spatial attention in reading.

Attention and Performance XVII is an extremely thorough and thoughtful book with outstanding contributors. It contains a wealth of information, with reviews of many cognitive theories, methods, and data that of value for neuropsychological researchers. This volume will also serve as an excellent reference book for students and professionals who want thorough state of the art coverage of the attention from the perspective of cognitive psychology. Many of the chapters do successfully bridge the gap between theory and application, affording readers the opportunity to explore how cognitive theory can be incorporated in clinical practice with neurological populations. However, readers unfamiliar with current cognitive theories may need to consult other texts to achieve background knowledge if they hope to meaningfully incorporate the ideas that are presented.

One weakness of the book arises from its scope. Because an extremely large body of information is addressed, how certain chapters relate to the underlying focus of the volume is not always clear. Also, while the book begins by

emphasizing the importance of ensuring that cognitive theories be biologically plausible, there is relatively little discussion of how the models that are presented fit into existing knowledge of the neural bases of behavior. The focus of the final chapters provides some coverage of these issues, but their scope is limited. Some of the cognitive models presented in earlier chapters appear rather complex and without clear neuroscientific justification, and most of the chapters include relatively little input from the extensive body of relevant neuropsychological research, which is unfortunate considering the volume’s focus on application. Also the book has a clear “top-down” orientation, with only passing mention of how the various models of “cognitive control” reconcile with developments in the field of neural networks and computational approaches such as the PDP framework. While the editors initially emphasize the need to avoid the “homunculus” construct for executive control, the book never fully addresses the mechanisms driving the proposed top-down level of control underlying the models that are reviewed.

Nevertheless, *Attention and Performance XVII* is an excellent book that may catalyze neuropsychological research. Beyond its obvious value for cognitive psychologists, this book will appeal most to cognitive neuropsychologists studying basic cognitive processes. However, it should also be of value to clinical neuropsychologists who want a good reference book for current cognitive theories and methods, particularly for the development of neuropsychological tasks. The reader should expect to be challenged by some of the concepts that are presented unless they are very familiar with the cognitive science literature. While not an easy read, the contents of this book may serve to stimulate new theoretical and methodological approaches in neuropsychology.

A Text for the Well-Rounded Practitioner

Neuropsychotherapy and Community Integration: Brain Illness, Emotions, and Behavior.
T. Judd. 1999. New York: Kluwer Academic/Plenum Publishers. 371 pp., \$79.95.

Reviewed by NANCY A. PACHANA, Ph.D., *School of Psychology, University of Queensland, Brisbane, QLD 4072, Australia.*

As individuals gain expertise in a chosen field they can begin to conceptualize how what they know can be applied more broadly, to new populations and situations, or to increase desirable outcomes. Judd’s book does just this. It takes our current understanding of the etiology, course, and sequelae of brain injuries, combines this with established

psychotherapy and rehabilitation techniques, and expands these into a cogent model of what Judd calls “neuropsychotherapy.” Simply put, neuropsychotherapy attempts to address the cognitive, emotional and behavioral changes in brain-injured persons, changes that may go undiagnosed, misdiagnosed, or untreated.

The very first pages of the book describe such a case of misdiagnosis and set the stage for what is to come. A stroke patient is having episodes of uncontrolled crying. The patient is referred to various mental health professionals who fail to recognize what the neuropsychologist knows: that the patient's emotional outbursts are linked to her CVA. More appropriate strategies for dealing with the symptom, including education of the patient and her family, form part of the suggested neuropsychotherapeutic intervention. A relatively simple problem (thinks this reviewer/neuropsychologist). However, such cases abound in clinical settings. So then is this merely a cautionary tale (indeed, a whole book) for the non-neuropsychologist? It is more than this, for even those patients who receive accurate diagnoses and adequate initial treatment for brain injuries still often need a myriad of follow-up interventions and referrals. These interventions, including neuropsychotherapy, are needed, according to Judd,

... because brain disorders often produce significant and disabling behavioral and emotional changes that cannot be adequately treated with conventional psychotherapy and that, in general, do not yet receive recognition or intervention proportionate to their importance (p. 8).

The full spectrum of possible useful interventions for brain injuries is quite broad, and so by necessity Judd's text attempts to address numerous issues. The first chapter, which explains the concept of neuropsychotherapy, along with Section I, "Theory," which describes how theories of neuropsychology, psychotherapy and cognitive rehabilitation relate to neuropsychotherapy, provides a framework that the following sections build upon. Section II, "Practice," describes specific assessment and psychotherapeutic techniques as applied to brain-injured patients. Section III, "Specific Problems," details the more common cognitive, psychiatric, and emotional problems associated with various types of brain injuries and neurological disorders. Finally, Section IV, "The Social Dimension," describes the impact of brain injury on the patient's family and the community, and outlines ways in which the patient and/or his or her family and community can reconnect.

Both the strengths of the book and its few weaknesses lie in its detailed structure and content. In terms of organization, the chapters for the most part are logically laid out and contain well-referenced and useful information. In particular chapter 5, detailing assessment techniques, captures Judd's vision of a holistic approach to brain injury. He carefully lists all possible areas to be assessed, including the patient's physical and social environment and how they function within it. Moreover, a rationale is offered for how extensive an assessment needs to be, how hypotheses are developed and tested, and how information gained from a variety of sources is integrated. I was particularly taken with the novel but pleasing organization of Section III, with descriptions, neuroanatomical underpinnings, and possible interview, testing and intervention techniques offered

for each symptom covered. In stark contrast, Chapter 6, with the questionable title "Fundamental Issues," was a hodgepodge of concepts including causality and blame, problem behaviors, and intervention techniques (both recommended and not) in no discernable order. Its contents might easily have been distributed among the other chapters.

In terms of the content and its presentation, the book again is rich in detail, with only minor distracters. In keeping with the book's comprehensive approach, Judd illustrates many of his concepts with charts and graphs. Such graphs at times did not add much to the knowledgeable reader's understanding, but might perhaps be of use to explain such ideas as the expected course of recovery to the patient or to family members. Throughout the book empirically validated techniques for particular problems are described, and their place in the context of neuropsychotherapy explained. For example, principle techniques of validation therapy are given in the chapter on neuropsychotherapy and related intervention practice. In the section dealing with marital and sexual relations, the PLISSIT model of levels of intervention for sexual problems of Griffith et al. is described. Such full descriptions in the text are much more satisfying than mere references to the techniques.

The boldest chapters are those that deal with the family and the community in relation to the brain injured person. Judd states that rehabilitation "cannot, and should not, deal with the entire life journey of the person who is living with the effects of brain injury" (p. 261). However, he notes that those in the health professions, particularly the mental health fields, often can be of great assistance in helping prepare the patient and his or her family for what lies ahead. According to Judd, ameliorating a set of presenting problems is only one piece of the bigger picture of helping the person get on with life.

While this book is indeed an excellent resource for psychotherapists interested in expanding their practice of therapy with brain-injured individuals, it works equally well as a resource guide for neuropsychologists interested in expanded follow-up care of their brain-injured patients. As Judd believes that many of the concepts in neuropsychotherapy can be utilized by a wide range of health professionals, such as occupational therapists and speech pathologists, as well as both professional and family caregivers, the book is written on a level that is quite accessible across disciplines. In fact, it is a text that would prove quite useful in any neuropsychology teaching program. Likewise, such a text in a traditional psychotherapy program serves to underline the importance of general familiarity with brain-behavior relationships and the sequelae of neuropsychiatric illnesses to the general clinical practitioner. However, the book also has something to offer the experienced clinicians, be they psychologists or neuropsychologists. It succeeds in bringing relevant aspects of neuropsychology, psychotherapy and rehabilitation practice to bear on the problems patients face in attempting to resume living their lives after brain injury.

Old and New Neuropsychology Make a Mixed Bag

Clinician's Guide to Neuropsychological Assessment, Second Edition. R.D. Vanderploeg (Ed.). Mahwah, NJ: Lawrence Erlbaum. 1999, 551 pp., \$49.95.

Reviewed by JACOBUS DONDERS, *Psychology Service, Mary Free Bed Hospital, Grand Rapids, MI.*

The second edition of *Clinician's Guide to Neuropsychological Assessment* is intended to be a graduate level textbook dealing with the practice of neuropsychology. The number of chapters has been expanded considerably, compared to the first edition of this book. Most of the new contributions are fairly up to date with the recent literature and pertain to areas of applied neuropsychology that have shown considerable growth over the past few years. In contrast, many of the purportedly revised chapters that were also present in the first edition are disappointing. For example, the chapter on "Principles of Neuropsychological Interpretation" appears to be an almost verbatim reprint of its 1994 counterpart and fails to review any of the literature that has since then developed with regard to issues such as reliability of change in test scores (Sawrie et al., 1996), effects of financial incentives (Binder & Rohling, 1996), or construct validity of commonly used tests (Goldman et al., 1996).

The text is divided into three parts. There are three new chapters in the first section. One chapter offers a model for interpretation of neuropsychological test data but is not clearly integrated with another chapter (carried over, with some updated references, from the first edition) on the application of those same test results. This may be confusing to the very audience for which this text was apparently intended (most notably graduate students and interns). On the other hand, the other two new chapters in this first section are excellent.

Gass provides a very balanced review of application of corrections for MMPI-2 items that may be reflective of acquired neurological impairment. I was pleased to see in this chapter an unequivocal caution against the use of such a correction factor in cases of mild head injury confounded by financial compensation-seeking or premorbid maladjustment. The only thing that I found missing in this chapter was a discussion of the Fake Bad Scale, which has shown promise in this context (Posthuma & Harper, 1998).

The final chapter in the first section, by Axelrod, presents a model for report writing. It includes many practical examples of how extensive jargon can be reduced to concise information that is actually useful to the reader. It also offers a review of the controversial issue of appending raw data to reports. I would suggest for additional consideration in a future version of this chapter some discussion of how to deal with very sensitive information that is of debatable significance to the referral question (e.g., HIV-seropositive status in an asymptomatic individual who is seen as part of a work-up for headaches).

There are three new chapters in the second section. Larabee provides a very readable review of the ethical and professional dilemmas that professionals may face in the forensic or medicolegal arena. The only minor criticism that I have is that some more information could have been provided about the known problems with cross-validation of some of the formulas for the assessment of malingering that are discussed, such as high false positive rates (McKinney & Russell, 1997).

Pramuka and McCue describe how neuropsychological assessments and reports (which often tend to be very deficit-oriented) can be made more useful in the context of rehabilitation. Although I would have liked to see some more information about the issue of dealing with insufficient deficit awareness, I anticipate that the way in which some of the other suggestions are presented in tabular form will be helpful to many novice readers.

The chapter by Koltai and Welsh-Bohmer on geriatric neuropsychological assessment is also full of feasible pragmatic suggestions, regarding issues ranging from dealing with fatigue to obtaining information from collateral sources. The reader should have been cautioned, though, that some of the advocated reference data for older adults (such as the "Mayo norms") may not be applicable in settings where a relatively large proportion of patients are ethnic minorities and/or without postsecondary education.

The final section of the book ends with a new chapter by Russell, who reviews several computerized scoring systems for comprehensive neuropsychological data. It was not clear to me why this needed to be a separate chapter, as it could have been integrated easily with his other chapter on the fixed battery approach.

Overall, I was left with mixed feelings after reading the second edition of *Clinician's Guide to Neuropsychological Assessment*. I was pleased with the fact that many of the chapters included some caution that proper neuropsychological assessment is not limited to the giving of more and more tests, and that instead one needs to obtain a thorough history and supplement the findings with observational and other data. I also appreciated the various suggestions to attempt to make the report more useful in light of the specific purpose and context in which the evaluation takes place. On the other hand, I was surprised that only cursory attention was paid to some of the issues that have been debated vigorously in the field over the past several years, such as the validity of demographic corrections to neuropsychological test scores (Fastenau & Adams, 1996; Heaton et al., 1996). Furthermore, I was disappointed by the fact that

several of the purportedly revised chapters did not inform the reader thoroughly with regard to how the field has progressed over the past 6 years. Thus, although some of the individual new contributions are outstanding, the volume as a whole comes across as somewhat uneven. The bottom line is that I would feel comfortable using parts of this book in a graduate level course, but I would also want to supplement it with another text (e.g., Adams et al., 1996) to make sure that the practice of clinical neuropsychology is presented in a more balanced fashion.

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