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BOOK REVIEWS

A Cognitive Neuroscience Album

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Neurological Foundations of Cognitive Neuroscience. Mark D'Esposito (Ed.). 2003. Cambridge, MA: MIT Press. 290 pp., $60.00.

Reviewed by Victor W. Mark, M.D., *Department of Physical Medicine and Rehabilitation, University of Alabama at Birmingham, Birmingham AL*.

The starting point of this interesting compact book is the recognition that two camps of professionals specialize in understanding cognitive functions: neuroscientists who primarily evaluate healthy individuals, and clinicians who work with brain-injured patients. Each group has a select acquaintance with cognitive functions, conditioned by the populations that it addresses, while having more limited understanding of the cognitive processes associated with the other group. Thus, this book attempts to bridge health and disease by showing how normal cognitive functions may be corrupted by brain illness, and thereby foster an improved understanding of cognitive processes in general.

The book's chapters address 11 cognitive disturbances that are each discussed by a different behavioral neurologist. Topics covered include spatial neglect, Wernicke aphasia, semantic dementia, and topographical disorientation. Each chapter is formatted to provide a representative brief case report, followed by an overview of clinical manifestations, supporting diagnostic test results, and a detailed summary of neuroimaging and cognitive evaluations from brain-lesioned and healthy subjects. Through these presentations the reader gains an up-to-date acquaintance with how brain illness may distort normal cognitive processes, as well as hypothetical models for how information is processed by the respective cognitive operations.

The book is thus essentially an album of cognitive neuroscience: the chapters are short, the book encompasses diverse disturbances, and a consistent format is maintained throughout. The volume succeeds in linking health and disease mechanisms and is expertly written, illustrated, and edited.

At the same time, as with albums in general, the coverage is not encyclopedic. Eleven topics, even with the included discussions of related disturbances, do not embrace the gamut of cognitive disorders in brain disease. However, this was intentional; the effort here is to demonstrate how clinical and experimental neuroscience may interact through a handful of carefully selected, well-defined disorders.

Although the spirit of the book is to encourage an exchange of information between these two groups of professionals, I sense that the audience most likely to benefit will be nonclinicians who have limited acquaintance with brain disease. For these individuals the book provides a concise introduction to behavioral neurology. On the other hand, practicing neuroclinicians either will not much care to understand normal cognitive mechanisms, or if they are so motivated, will probably consult more comprehensive behavioral neurological treatises, such as Heilman and Valenstein's *Clinical Neuropsychology* or Mesulam's *Principles of Behavioral and Cognitive Neurology*, both of which have been recently revised and do not cost much more. While neither of these works explores cognitive mechanisms in as much detail as does D'Esposito's volume, these books partially fill in the gaps among the eleven topics by reviewing considerably more disorders. Thus, the curious reader whose appetite has been whetted by a discussion of the varieties of aphasia can conveniently reach for comprehensive coverage of other closely related neurologic disorders (e.g., dementia, psychosis, aprosodia) simply by turning the page.

I have a few concerns. All of the authors in *Neurological Foundations* are neurologists, practicing clinicians who are also recognized leaders in cognitive research. Although by being clinical investigators, the contributing authors are well qualified for this volume, it is unfortunate that the book intentionally excludes academic nonphysicians (neuropsychologists, speech-language pathologists) or even nonneurologist physicians (psychiatrists, geriatricians) who nonetheless manage neurologic disorders and are competent to integrate clinical and experimental observations. Second, the diverse disorders in this book emphasize disturbances that follow focal brain illness, associated with a specific brain region in most cases. Readers who are new to neurology, neuropsychology, or cognitive science might presume that a specific cognitive disorder does not merit much attention if it lacks a localizable lesion. However, there is clearly much to learn

from cognitive disturbances that are not well localized, such as schizophrenia, depression, Williams syndrome, and the reduction in cognitive processing speed that comes with aging.

Last, it would have been helpful if the book had provided a critical overview of the techniques used to evaluate cognitive processes that are used throughout the book. For example, how well founded are the assumptions concerning the localization of operations through subtraction functional neuroimaging? Do differences in temporal resolution of various functional imaging techniques (e.g., magnetic source imaging *vs.* PET) affect conclusions regarding localization? What does recovery after a permanent structural brain lesion tell us about the "localization" of the particular affected function? What are the limitations of single case reports *versus* series studies of clinical phenomena? How much do order effects, familiarity with the test methods or environment (e.g., laboratory *vs.* home), educational level, or hand preference affect the outcomes from cognitive testing? How specific are particular cognitive tests for the functions they are purported to assess? Can case reports that use cognitive assessments with little psychometric validation still be instructive?

Such overview by itself could well devour an entire book. However, since *Neurological Foundations* targets an introductory audience, its aims would be better served through presenting a condensed critical regard for the methods of cognitive assessment, which would prepare the reader to more skillfully interpret the summaries in the chapters that follow. The laudable goals *of Neurological Foundations* merit subsequent updated editions, which, it should be hoped, would more flexibly embrace and represent the spectrum of professional backgrounds and disorders that are associated with cognitive neurologic illnesses.

The Importance of Being Right

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Handedness and Brain Asymmetry: The Right Shift Theory. M. Annett. 2002. Hove, East Sussex, UK: Psychology Press. 396 pp., $80.00.

Reviewed by Merrill Hiscock, Ph.D., *Department of Psychology, University of Houston, Houston, TX*.

Marian Annett's recent book on handedness and cerebral dominance was published a dozen years after Efron's (1990) declaration that the era of hemispheric specialization had ended. Why did that era not end for Annett? One answer is that Annett's work differed from that of the majority of laterality researchers. Even during the heyday of laterality studies, Annett remained aloof from the mainstream endeavor of characterizing left- and right-hemisphere functions. Instead, Annett pursued a line of laterality research that dealt primarily with handedness in the general population. She accumulated large quantities of data about human handedness and used those data to support her right-shift (RS) theory of the genetics of handedness. With the publication of her new book, the interested reader has convenient access to the fruits of a remarkably focused and durable research career.

Annett describes her book as a detective story. The story begins with the author's skepticism concerning the "many layers of opinion and surmise" that constituted the older literature on handedness and brain asymmetry. Starting over, she proceeded to build a new theory that was grounded in quantitative relationships found in large samples. Relying more on biology than medicine to guide her thinking, she constructed a large corpus of work that she presents coherently in her book.

The first chapter is a fine introduction to the "puzzle" of handedness and its relation to language lateralization. This chapter by itself would serve well as an assigned reading for a graduate class on laterality. In Chapter 2, after arguing that hand preference is a continuous variable, Annett explains how she used the botanists' technique of association analysis to develop and validate the 12-item Annett Hand Preference Questionnaire (AHPQ). The AHPQ, along with a peg-moving task, accounts for much of Annett's handedness data.

Chapters 3–5 constitute the theoretical core of the book, for it is here that Annett describes the fundamental tenets and implications of the RS theory. In these chapters, the author guides the reader step by step through the observations that underlie the RS theory. Once Annett understood that handedness is a continuous rather than a discrete variable, it became evident to her that the proportions of right-, mixed- and left-handedness form a binomial distribution with respective percentages of 66, 30 and 4. The data on hand and paw preference in nonhuman animals also conform to a binomial distribution, but the distribution is symmetrical. Then came Annett's *eureka!* experience, her recognition that human handedness is animal pawedness with the addition of a right-shift (RS) factor. Or, to state the RS theory more carefully: Human handedness is the result of chance plus a species-specific bias toward dextrality (the RS factor) and cultural enhancement of dextrality. Annett uses published compilations of aphasia cases to estimate the population frequency of the right-shift gene (RS+) and

to specify the relationship between speech lateralization and handedness. Then she demonstrates that a single gene can account for patterns of handedness in families and in pairs of monozygotic and dizygotic twins.

In the next part of the book (Chapters 6–9), Annett addresses various topics: stability of handedness, implications of an additive version of the RS model, asymmetries other than handedness and speech lateralization, and associations among the different asymmetries. A principal conclusion is that, irrespective of the asymmetry in question, about two-thirds of individuals show a lateral bias (e.g., toward left-sided language) whereas the remaining one-third show a random distribution of asymmetries around an unbiased mean.

As if to accommodate the reader who is beginning to grow weary of handedness studies, the next section of the book (Chapters 10–14) entails a plot twist that expands the scope of the RS theory and makes it relevant to phenomena outside the realm of laterality. In this section, Annett articulates her thesis that the three genotypes (RS++, RS+− and RS−−) exemplify a balanced polymorphism with heterozygote advantage. If the RS+ allele were entirely advantageous to its bearer, she reasons, people with the RS++ genotype should have become ubiquitous. The high prevalence of heterozygosity (as inferred from handedness distributions) suggests that both benefits and costs come with the RS+ allele. Annett argues that the primary benefit is excellence in perceiving and producing speech sounds, whereas the primary cost is relatively poor skill with the left hand. Both characteristics are derived from the effect of the RS+ allele on the left cerebral hemisphere. The reader is then told about a far-ranging assortment of studies—studies of cognitive abilities, educational attainments and prowess in tennis and cricket, as well as studies of people with learning disabilities, schizophrenia and autism—that the author offers as support for the benefits of heterozygosity.

In the final section (Chapters 15–17), Annett discusses a few independent tests of the RS theory and briefly reviews alternative theories of handedness. She points out ways in which the RS theory differs from the genetic theory of McManus (1985), with which it is sometimes confused. She succinctly states the principal tenets of RS theory in the last chapter before discussing some implications of the theory for psychological processes and offering some speculations about the evolution of speech and laterality.

A detective, scientific or otherwise, has a choice of investigative styles. She may adopt an inductive style that requires the painstaking accumulation of clues before a hypothesis is selected. Alternatively, she may choose a deductive style in which a hypothesis is formulated early in the investigation and then used to guide the search for more evidence. Annett has embraced the latter style even though this choice may cause the evidence to be seen through a selective filter. Evidence that is incompatible with the hypothesis may be overlooked and ambiguous evidence may be interpreted in a way that favors the hypothesis.

Indeed, there are numerous instances in which Annett makes questionable *post-hoc* assumptions and adjustments to reconcile evidence with her theory. One example pertains to the handedness of adults who have become dysphasic following stroke. An elevated frequency of left-handedness typically is taken as evidence that language is more often represented bilaterally in left-handers than in right-handers, thus making left-handers more susceptible to at least a transitory dysphasia following damage to either hemisphere. Annett, however, after pinpointing data that are inconsistent with RS theory, concludes that the investigators must have used different criteria for classifying the handedness of dysphasic and non-dysphasic patients. Another assumption about handedness criteria is invoked to bring the results of sodium Amytal testing into agreement with the RS theory. Additional *post-hoc* adjustments include reductions in the expressivity of the right-shift gene in twins and the introduction of "pull to concordance" corrections to accommodate data on the joint distributions of writing dominance with throwing and kicking dominance.

By its nature, the RS theory offers an abundance of interpretative latitude. Because the suspected RS gene has not been identified, the three genotypes cannot be distinguished on the basis of genetic testing. The probabilities of the different genotypes within a sample must be inferred from the distribution of relevant phenotypic characteristics such as handedness. However, because handedness is determined primarily by chance, there is only a weak relationship between handedness and the putative genotype. The problem is complicated by the fact that handedness is defined as hand preference in some studies and as asymmetry of manual skill in other studies. The two operational definitions are correlated but not identical. For all those reasons, the predictions of RS theory are difficult to confirm or disconfirm unequivocally.

The student of handedness is advised to complement Annett's book with other readings that reflect different perspectives. This comment is not intended to impugn the merits of RS theory, but only to point out that the author is an unabashed advocate of the theory. Annett is a clever detective, but she never loses sight of what she wants to find. As she confesses at one point, readers should not expect her to be impartial. Whereas her confession may have been whimsical, it raises some serious questions about the role of theory in behavioral science. What is the purpose of a theory? Must a theory be correct if it is to have scientific value? What is a reasonable expectation for support of a theory? Should one demand a perfect fit? An approximate fit? A mixture of good and poor fits if the poor fits can be patched up by post hoc assumptions? Can the creator of a theory ever be an impartial arbiter of the evidence, or should behavioral science be divided—following the example of physics—into theoretical and experimental branches?

The book is well written and, given the influence and scope of RS theory, it is essential reading for any neuropsychologist with a strong interest in laterality. However, debate about this particular detective story will not end here.

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As much as Annett would like her right-shift theory to be the starting point for the ultimate explanation of human handedness, it is too soon to know. The answers may have to await discoveries at the genetic level of analysis. In the meanwhile, the theory's correctness may be less important than the heuristic value of some of its component concepts, such as the prominent role of chance and the proposition that handedness is derived from speech lateralization (rather than *vice versa*).

So long as most human beings write and throw with the right hand and use the left side of the brain to control speech, the phenomenon of hemispheric specialization will continue to attract researchers. As new evidence becomes available, Annett, no doubt, will interpret that evidence in terms of her theory and others, no doubt, will disagree. Maybe the era of hemispheric specialization is only beginning.

REFERENCES

Efron, R. (1990). *The decline and fall of hemispheric specialization*. Hillsdale, NJ: Erlbaum.

McManus, I.C. (1985). Handedness, language dominance and aphasia: A genetic model. *Psychological Medicine, Monograph Supplement 8*.

Minding the Mind

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Matter of Mind: A Neurologist's View of Brain–Behavior Relationships. Kenneth M. Heilman. 2002. New York: Oxford University Press. 224 pp. $35.00.

Reviewed by Robert L. Heilbronner, Ph.D., ABPP, *Chicago Neuropsychology Group, 333 North Michigan Avenue, Suite 1801, Chicago, IL 60601, USA.*

I have always enjoyed doing book reviews and my task is easier when the book holds my interest and leaves me with a favorable impression. I was excited to review *Matter of Mind* as I enjoy reading anecdotes and clinical vignettes from outstanding neuroscientist and seasoned clinicians. The prospect of gaining some insight into the mind of Ken Heilman was a draw to me! I read the first edition of Heilman and Valenstein (1979) when I was in graduate school; the subsequent two editions hold prominent places on my office bookshelves. I eagerly embarked upon my review of this book, loaded as it appeared to be with rich clinical and scientific material.

This book is divided into nine separate chapters. It mirrors rather closely Heilman and Valenstein's texts in its chosen topics of Language, Emotions, Attention, Memory, Cognitive–Motor Skills, and Sensory-Perception and Recognition. Where it expands beyond the previous books is in the chapters on Self-Awareness, Conation and Intention. As introductions to the different types of deficits that can arise following various forms of brain damage, all of the chapters are very well-organized and could serve as excellent reviews and summaries for students and trainees. More experienced neuroscientists already likely understand most of the concepts and terms in this book. Yet, it is still nice to review them, especially for those of us who do not often have the opportunity to observe the idiosyncratic deficits that arise from very specific brain lesions.

The chapter on Emotions goes beyond prosody and expression, two concepts that Dr. Heilman has extensively studied and written about. His explanation of the different theoretical approaches to describe emotional experiences made interesting reading. For all we know about the brain and brain function, we are just beginning to gain an understanding of the complexity of emotion and how certain types and sites or brain damage mediate positive and negative emotions. Heilman touches briefly on how the manipulation of neurotransmitters such as serotonin may influence the experience of emotion. I would have liked to have seen more written about this.

The chapter on Self-Awareness includes sections on asomatognosia (deficit of self-knowledge) and anosognosia (unawareness of one's deficits). I was anticipating that it would include a more extended discussion on concepts like insight, consciousness, and even "the mind." After all, the title of the book implied that a discussion on the mind would take place at some point. However, these terms were not found in this chapter nor in any other chapter. Nevertheless, agnostic syndromes such as anosognosia and asomatognosia and their counterpart—self-awareness—are interesting, and the author is indeed a noted expert on these syndromes. Little to no reference was made to other forms of unawareness, except for a very brief (and somewhat outdated) discussion on psychological denial (à la Weinstein and Kahn).

The chapter on Memory gave a good overview of working memory, declarative memory, procedural memory, and semantic memory, concepts and systems with which most neuroscientists should already be familiar. Students would find this interesting reading and it would serve as a good primer. For patients and families, a lot of the content may be over their heads. I kept asking myself, "How will this benefit a patient or family member?" "Will it answer the questions they have about their particular brain injury or disease?" Perhaps, chapters like this one on memory will provide the answers that some people are looking for. They may want to understand the site and cause of memory im-

pairment, but are probably much more interested in learning about effective treatments for memory deficits. Heilman's book does not offer a lot of treatment answers or recommendations. On the other hand, this chapter may help patients and family members to be more effective consumers, i.e., to ask the right kinds of questions of their doctors.

Chapter 7 and 8 on Cognitive–Motor Skills and Sensory–Perception and Recognition are the stuff of classic neurology. Indeed, students of neurology and neuropsychology, should find the discussion on apraxias and agnosias very interesting reading. Most of us in clinical practice rarely see such disorders as "tactile anamia" or "auditory amusia," so I am glad that experts like Dr. Heilman can explain them to us. These chapters are an example of the book's audience problem. Its content is most suitable for clinicians; patients and families might find little to maintain their interest unless the patient has achromatopsia, asterognosia, or some other isolated "gnosia."

The final chapter on Conation and Intention discusses action initiative arising from within oneself. Concepts like abulia, akinesia, and impersistence are discussed with excellent explanations of the neuropathology underlying each of these conditions. As expected, emphasis was on the role of frontal lobes. Like the other chapters, the clinical vignettes made for the most interesting reading.

A nice feature of this book is the summaries and selected readings at the end of each chapter. This can help readers to focus on what was emphasized in the preceding pages and provides them with some valuable resources for further inquiry. Unfortunately, the book lacks a summary chapter. Dr. Heilman might have added something at the end, for example, a discussion about his visions for the future, or a summing up of his years working as a behavioral neurologist. Readers will have to be content with the rich clinical vignettes. Yet, some of us want more of Dr. Heilman's *mind*.

From Neuromythology to Neuroscience

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Cortex and Mind: Unifying Cognition. Joaquin Fuster. 2003. New York: Oxford University Press. 294 pp., $47.95 (HB).

Reviewed by Elkhonon Goldberg, *Department of Neurology, New York University School of Medicine, New York, NY.*

Cortex end Mind by Joaquin Fuster is the best book in the field I have read since *Higher Cortical Functions* by Alexander Luria. It is a book of similar scope and ambition, but reflecting the Zeitgeist of the beginning of the twenty-first century, rather than that of the middle of the twentieth century. I cannot think of anything of this importance and conceptual clarity written in between. It is also a very European book, decidedly about the forest and not about the trees, and infused with the sort of intellectual romanticism that our prevailing empiricist mores tend to eschew with almost embarrassed incomprehension. As a student of Luria and a fellow European, I can relate to all of the above. The logic, the philosophy and the general intellectual bent behind the book resonate so closely with my own, that I felt that I could have written this book, but not nearly as well or with this degree of professional erudition. As in his previous books, Fuster's ability to inject a certain kind of elegance and verve in the discussion of even the most arcane technical matters makes *Cortex and Mind* not just an enlightening read but also an enjoyable one.

The scope of the book, and the mastery of a wide range of subjects, is nothing short of astounding. Fuster draws on the concepts and findings from neurophysiology, neuroimaging, neuropsychology, cognitive science, computational neuroscience and more. He is equally at home on all of these territories and interweaves them into a single coherent train of thought in a unique and creative way. Personally, I found Fuster's ability to integrate the ideas emanating from experimental and computational approaches particularly enticing.

The main point of the book is that cognition is supported by a vast neural network of immense complexity, which permits the formation of a large number of overlapping and interactive intricate circuits. Such large-scale circuits of sufficient degrees of complexity correspond to distinct mental representations. Fuster refers to them as *cognits*.

The opening chapters of the book deal with the neural network architectures and how these architectures embody mental representations, cognits. An important distinction is made between mental representations and the operations upon them. The subsequent chapters deal with the neural bases of perception, memory, attention, language and intelligence. The epilogue addresses the neurobiology of consciousness. It includes, among other things, a very cogent discussion of the relationship between consciousness and attention.

Cortex and Mind is valuable both for the advanced neuroscientific concepts it conveys and for the entrenched neuroscientific myths it dethrones. With great clarity, Fuster defines a certain sophisticated understanding of the brain's function, and with great civility, gentility even, he debunks some of the most enduring misconceptions in the field.

As a discipline, cognitive neuroscience has benefited mightily from advances proffered to us on a silver plate

from elsewhere: neuroimaging from physics and chemistry, computational methods from mathematics and computer science. But conceptual breakthroughs of our own making have been preciously scarce and some of the constructs still in circulation today are so outdated, they border on atavistic. Here are a few examples of the myths that Fuster dispatches:

False: Cognition consists of faculties

True: The same large-scale neuronal ensembles are the substrates of all the so-called "faculties." "Mental faculties" have been with us since the beginnings of psychology. They have served as a heuristic metaphor, a finite taxonomy into which we force the virtual infinity of mental manifestations. But what had been a useful epistemological expedient, turned into an obfuscating ontological mirage, when psychologists began to take these "faculties" literally and embarked on an earnest search of their neuroanatomical loci and the "true" boundaries between them.

Even today, one hears ceaseless debates, whether Patient X suffers from a deficit of attention, or memory, or executive functions. When I try to explain to my students, and sometimes to my colleagues, that there are no intrinsic boundaries between these so-called "faculties"; that they are all figments of our imagination, useful maybe but figments nonetheless; that such debates are productive only to a point, beyond which you might as well start counting angels dancing on the head of a pin, my admonitions are met with impatience and suspicion. The same is true for the debates about what exactly a particular neuropsychological test measures, or which exactly DSM diagnosis should be affixed. For some reason, the understanding of where heuristic utility of finite taxonomies ends and they become self-defeating, is a difficult insight to develop. Fuster's book offers the most lucid and cogent explanation of these nuanced concepts to my knowledge to date.

Having described the general dynamics of large-scale neural circuits in the opening chapters, Fuster proceeds to show that *perception, memory, attention, language, and intelligence all involve different activation patterns on the same distributed neuronal networks*. Their neuroanatomical separateness is indeed a myth.

False: Higher-order cognition is modular.

True: Cognition is highly distributed and the cognit-bearing networks overlap and interact. The same neurons and microcircuits are components of different large-scale circuits. While modularity is present in sensory and motor cortices, it breaks down in association cortex.

I am on record likening the recent (and mercifully waning) modularity fad in cognitive psychology with the scientific equivalent of a Visigoth invasion. As a guiding principle in understanding the functional organization of the neocortical association areas, modularity is not just wrong, it is intellectually offensive.

False: Incoming information is processed in the neocortex, but memories are stored elsewhere, maybe in the hippocampi.

True: Memories are formed as synaptic modifications right where the information is received and processed, in the neocortex. Fuster proceeds to draw a cogent distinction between the engram-containing cortical networks and the extensive facilitatory subcortical machinery. In my own work, I drew a similar distinction between the representational and activational aspects of the machinery of memory.

False: Short-term memory and long-term memory are neuroanatomically distinct.

True: Short- and long-term memory are stages of the same process involving the same distributed neuroanatomy.

False: Consciousness is mediated by special neuroanatomical machinery.

True: Consciousness is a threshold phenomenon, which emerges when the cortical network activation reaches a certain degree of intensity and temporal duration.

To this litany of myths debunked by Fuster with such force and conviction, I will add another one, about the phyletic memory for language. It concerns the debate, whether language is supported by the relatively general-purpose neural machinery of a certain level of complexity; or whether some, as yet to be characterized, genetically programmed language-specific neural machinery exists in the human brain, somewhat akin (in a broad sense) to the feature-specific cells in the visual cortex. The latter notion was originally advanced by Noam Chomsky and has gained considerable following. I have always felt that it flies in the face of my own general neurobiological intuitions.

Fuster examines this premise cautiously and skeptically; but then he steps back and declines to take a stand. I do not presume to read his mind, but if we agree on this issue as much as we agree on everything else, and if I read between the lines of his book accurately, then this will follow:

False: Language is supported by genetically programmed language-specific neural machinery.

True: No such machinery exists. Language is supported by the relatively general-purpose neural machinery of a certain level of complexity.

I believe that *Cortex and Mind* will become an instant classic in the mind–brain sciences, or at least it should. And it being under 300 pages in length is a good thing. It increases the likelihood that the book will actually be read and not merely acknowledged and shelved. Fuster's views are my views, and now a text finally exists, which will be a required reading for every future student of mine. This book should be read very closely by every practitioner and student of the mind-brain sciences in the broadest sense. They will both learn from it and enjoy it.

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Some Practicalities of Neuropsychological Practice

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Clinical Neuropsychology and Cost Outcome Research: A Beginning. G.P. Prigatano and N.H. Pliskin (Eds.). 2003. New York: Psychology Press. 503 pp., $74.95.

Reviewed by Brick Johnstone, Ph.D., *Department of Health Psychology, School of Health Professions, University of Missouri-Columbia, Columbia, MO*.

"*Clinical Neuropsychology and Cost Outcome Research*" is the initial volume of the National Academy of Neuropsychology Book Series, "Neuropsychology: Scientific Basis and Clinical Application." The editors of the book, who are well-known for both their clinical expertise and research accomplishments, have arranged for other well-known leaders in the field to author the individual chapters of this book.

The main premises of the book are that there is a need for "neuropsychologists to demonstrate to health care economics, government officials, and third party payers the value of their services," and that we must begin to educate neuropsychological trainees in the economics of neuropsychology and health care early in their careers. In the Preface, Drs. Prigatano and Pliskin note that if the specialty is to survive in the future it is incumbent upon us to demonstrate the subjective and objective value of what we do. The authors propose this book as a beginning text for this area (indeed, subtitling the book, "A Beginning"), and state that there actually is very little research to date on the cost-benefit of neuropsychological services.

The book begins with introductory chapters on health care, economics, and neuropsychology, followed by eight different sections on CNS disorders and professional services/issues. In the introductory chapters the rationale is presented for why cost outcome research is needed, with examples of how cost outcomes research can be conducted. Based on a model by Drummond et al. (1998), the authors provide examples of several methods by which to conduct cost-outcomes research, including cost-minimization, cost-effectiveness, cost-utility, and/or cost-benefit analyses. Based on this model, the majority of chapters in the book provide hypothetical examples of neuropsychological cost outcomes analyses for different neuropsychological disorders. The last chapter of the book, "Measuring the Economics of Neuropsychology," provides general information on, and an excellent overview of, the main issues involved in cost-outcomes research for all health care professions. This chapter may be the most useful one in the book, and should be read at the beginning with the introductory chapters.

After the introductory chapters, Part I through VI focus on specific central nervous system disorders, including traumatic brain injury, cerebral vascular disorders, neoplasms, dementia, epilepsy, and learning disabilities. Each of these chapters present basic clinical information related to these clinical disorders, subjective benefits of testing persons with the disorder, previously published economic outcome studies related to the disorders (which are few), and case examples of how cost outcomes research can be conducted for persons with the disorder. Although some chapters provide information regarding objective costs associated with the disorders (e.g., total annual health care expenditures for the different disorders), a few present no data on cost outcomes which is a problem for a book of this nature. These latter include the chapters on TBI, physician competency, and forensics. Clinical and economic outcome data on rehabilitation and psychotherapy appear in Part VII. Part VIII deals with special topics (e.g., assessment of competency of physicians, forensic neuropsychology, malingering, and measuring the economics of neuropsychology).

The primary value of this book is its information about the existing literature regarding cost-outcomes research and issues, and the rationale for why neuropsychological cost-outcomes research is needed. In addition, the editors/authors have provided a framework from which to conduct future neuropsychological cost outcomes research (i.e., cost-minimization, cost-effectiveness, cost-utilization, cost–benefit analyses), as well as examples on how such research can be completed. Some chapters provide more and better cost-outcomes data than others, and include very helpful information regarding the long-term costs associated with specific disorders (e.g., CVA, dementia, epilepsy, cognitive rehabilitation, malingering). For example, the chapter on non-epileptic seizures gives excellent data on how the use of inpatient video-EEG seizure monitoring leads to decreased health care utilization, which is an excellent model for future neuropsychological cost outcomes research.

Although the rationale for the book is sound, its primary weakness is that there has been very little research to date on neuropsychological cost outcomes. As a result, many of the chapters primarily read as basic, introductory chapters on the neuropsychological evaluation of different CNS populations. In addition, several chapters, although well written, cover topics that do not appear to fit well with the theme of the book (e.g., "Neuropsychological Assessment of Physicians Whose Competency to Practice Medicine is Being Questioned"; "Clinical Neuropsychology in the Forensic Arena").

This book can be helpful to clinical neuropsychologists in informing them regarding existing cost-outcomes research on specific CNS populations. However, the majority of material in the book may be of limited usefulness to

clinicians as the chapters primarily present only introductory clinical information related to specific CNS disorders. The book will be most useful to neuropsychological researchers, as it provides basic information regarding existing cost-outcomes data, and provides suggestions and examples for the type of cost outcomes research which should be conducted in the future. As promised, the book is a good "beginning," and hopefully will lead to further and much needed cost outcomes research, which can be more fully presented in a second edition of the book.

REFERENCE

Drummond, M.F., O'Brien, B.J., Stoddart, G.L., & Torrance, G.W. (1998). *Methods for the economic evaluation of health care programmes*. New York: Oxford University Press.

OTHER BOOKS OF INTEREST WITH BRIEF NOTES BY THE BOOK REVIEW EDITOR

Consciousness is a hot topic now which, in itself, presents puzzles that look resolvable, and it also touches on most every other aspect of human behavior and just about all of brain function. Carter's book is addressed to the well-educated and curious general reader. It is richly and humorously illustrated in full color—a fun read as well as a comprehensive introduction to the issues. Dehaene's volume is a collection of some quite technical research papers which can provide reference material for fellow researchers and clinicians interested in the fine-tuned connections and interactions underlying various aspects of conscious behavior. Baars and colleagues have edited a ten section (e.g., III. Attention: Selecting one conscious stream among many; VI. Below the threshold of sensory consciousness; X. Theory), 73 chapter plus editorial introductions book in small print with contributions from renowned scientists such as George Mandler, Francis Crick, David Hubel, H.W. Magoun, Joseph Bogen, William Dement, Antonio Demasio, and Patricia Goldman-Rakic, unfortunately perhaps one of her last contributed chapters. This book lives up to its title as it appears to be a necessary resource for anyone studying any aspect of conscious behavior, and a valuable addition to the library of thoughtful clinicians.

Baars, B.J., Banks, M.P., & Newman, J.B. (Eds.). (2003). *Essential sources in the scientific study of consciousness*. Cambridge, MA: The MIT Press. 1192 pp., $60 (PB).

Carter, R. (2002). *Exploring consciousness*. Berkeley, CA: University of California Press. 319 pp., $34.95 (HC).

Dehaene, S. (Ed.). (2002). *The cognitive neuroscience of consciousness*. Cambridge, MA: The MIT Press/Elsevier. 243 pp., $40 (PB).

Banich, M.T. & Mack, M. (Eds.). *Mind, brain, and language: Multidisciplinary perspectives*. Mahwah, NJ: Lawrence Erbaum Assoc. 394 pp., $39.95 (PB).

Boniface, S. & Ziemann, U. (Eds.). (2003). *Plasticity in the human nervous system: Investigations with transcranial magnetic stimulation*. New York: Cambridge University Press. 361 pp., $95 (HC).

Ettinger, A.B. & Kanner, A.M. (Eds.). (2001). *Psychiatric issues in epilepsy: A practical guide to diagnosis and treatment*. Philadelphia: Lippincott Williams & Wilkins. 400 pp., $110 (HC).

Fisch, G.S. (Ed.). (2003). *Genetics and genomics of neurobehavioral disorders*. Totowa, NJ: Humana Press. 428 pp., $125 (HC).

Huttenlocher, P.R. (2002). *Neural Plasticity: The effects of environment on the development of the cerebral cortex*. Cambridge, MA: Harvard University Press. 274 pp., $52.50 (HC).

Karnath, H.O., Milner, D., & Vallar, G. (Eds.). (2002). *The cognitive and neural bases of spatial neglect*. Oxford, UK: Oxford University Press. $110 (HC).

Parker, R.S. (2001). *Concussive brain trauma: Neurobehavioral impairment and maladaption*. Boca Raton, FL: CRC Press. 412 pp., $129.95, £86 (HC).

Uttal, W.R. (2001). *The new phrenology: The limits of localizing cognitive processes in the brain*. Cambridge, MA: The MIT Press. 255 pp., $22 (PB).

Wasserstein, J., Wolf, L.E., & Lefever, F.F. (Eds.). (2001). *Adult attention deficit disorder: Brain mechanisms and life outcomes*. New York: Annals of the New York Academy of Sciences (v. 931). 409 pp., $90 (PB).

Zaidel, E. & Iacoboni, M. (Eds.). (2003). *The parallel brain: The cognitive neuroscience of the corpus callosum*. Cambridge, MA: The MIT Press. 551 pp., $95 (HC).