
BOOK REVIEWS

Neuropsychology for Cognitive Scientists

Patient Based Approaches to Cognitive Neuroscience, by M.J. Farah and T.E. Feinberg. 2000. Cambridge, MA: MIT Press. \$45.00 (PB).

Reviewed by ROSALEEN A. MCCARTHY, Ph.D., *University of Cambridge, Cognitive Neuropsychology Unit, Department of Experimental Psychology, Downing Street, Cambridge, CB2 3EB UK.*

Neuropsychology is blessed by a huge and burgeoning literature—but most practitioners are cursed by a lack of time. How can one possibly keep abreast of the latest developments in computational modelling, functional imaging and clinical practice, while sustaining research within one's own field of interest? Most of us rely quite heavily on review articles and tutorial chapters. Farah and Feinberg's edited set of review chapters *Patient Based Approaches to Cognitive Neuroscience* is a very useful and broad-ranging collection with extensive line art and grey-scale illustrations. This book would be a useful addition to one's personal library as well as a valuable source of readings for advanced students or clinical trainees. Farah, Feinberg and their publishers are to be congratulated in providing such a valuable work.

Patient Based Approaches to Cognitive Neuroscience is not a new work, however. It is entirely comprised of 31 chapters drawn from Farah and Feinberg's 67 chapter collection *Behavioural Neurology and Neuropsychology*. Clinical neuropsychologists and readers working with patients may still find the original text to be a worthwhile investment since it covers a wider range of relevant material. Chapters in the parent text that were considered to be of specialist medical interest were culled in order to make the work accessible to cognitive scientists. The remaining chapters emphasize "traditional" cognitive areas. Topics that are closer to clinical practice (including "Emotion" and "Delirium") were omitted and the remainder combined into a relatively well-balanced collection. Clinical studies are presented as an integral part of the broader enterprise of cognitive science—and not just as an alternative means of localizing function in the brain. Patient-oriented research can offer a unique window into normal function and in turn, normal and computational studies can shed light on pathology.

The book is comprised of six sections, each made up of between three and eight short chapters. The first section,

"History, Methods, Principles" sets the scene—and a high standard—with contributions from the Editors ("History"), from Damasio and Damasio ("Lesion Methods"), from Raichle ("Functional Imaging") and Marcel-Mesulam (anatomical principles). The second section on "Perception and Attention" is also outstanding and includes chapters on auditory agnosia, disturbances of the body scheme and misidentification syndromes in addition to the anticipated material on "Visual Agnosia," "Prosopagnosia" and "Neglect." The third section, "Language," deals with disorders of language and literacy with chapters on acquired aphasia, dyslexia and agraphia. However, in this section there are also three chapters concerned with developmental neuropsychology ("Specific Language Impairment," "Acquired Language Disorders in Children," and "Developmental Reading Disorders"). The fourth section, "Memory," is perhaps the least comprehensive and at 25 pages is also relatively brief. Amnesia, constructive memory disorders and semantic deficits are covered but material specific impairments of episodic memory and short-term/working memory are only mentioned in passing. The penultimate section, "Other Higher Functions," is something of a mixed bag with two chapters on frontal lobe deficits, and one each on callosal disconnection, apraxia and acalculia. The final set of chapters breaks with the functional approach used to frame the other sections of this book and address a range of issues relating to dementia. Presumably this topic was chosen in preference to other types of neuropathology because of the large research community working in this area.

Each chapter gives a short and assertive overview of a specific area within cognitive neuroscience. The style is clear and accessible with sufficient bibliographic citation to take the interested reader further into the literature. The eminent contributors give tutorial summaries of key aspects of their current position rather than general reviews of the topic. In this respect the book is brave. The chapters are

not anodyne summaries—some of the material is contentious and this reviewer certainly found herself tempted to shout “No!” at various points when reading the text. However, disagreement is the lifeblood of science and moreover, a strong, well-articulated position is a very useful didactic device. As an educator, I welcome this volume.

The present work manages to take the reader from basic and historical concepts through to the cutting edge of contemporary research and opinion in the space of a few short pages. I shall certainly be recommending *Patient Based Approaches to Cognitive Neuroscience* on my advanced courses.

What's In A Name?

Neurological Eponyms, Peter J. Koehler, George W. Bruyn, and John M.S. Pearce. (Eds.). 2000. New York: Oxford University Press. 386 pp., \$59.95.

Reviewed by CHRISTOPHER M. FILLEY, M.D., *Behavioral Neurology Section, Department of Neurology and Psychiatry, University of Colorado Medical School, Denver, Colorado, and the Denver Veterans Affairs Medical Center.*

Neurology, like many disciplines in medicine and science, has had a penchant for naming many of its discoveries after their discoverers. This tendency became especially evident in the early 20th century, for example, when the practice of neurology was essentially confined to bedside diagnosis, and dozens of pathological reflexes, many now largely forgotten, came to be recognized by the names of the neurologists who popularized them. Such eponymic zeal has engendered controversy, however, as some have argued that it is more “scientific” to apply purely descriptive labels to neurologic phenomena. This book clearly supports retaining the use of eponyms in neurology, both because of the inescapable familiarity that many of these terms have acquired, and for the importance of the person behind the eponym. The result is a useful and readable compendium of selected neurologic information, along with a substantial amount of detail on the history of neurology.

Neurological Eponyms is a collection of 55 essays on various topics in clinical neuroscience, with contributions from many distinguished authorities in Europe and North America. The essays are divided into the five categories of structures and processes, symptoms and signs, reflexes and other tests, syndromes, and, lastly, diseases and defects. Thus the reader is informed of the origin of such familiar entities as Brodmann’s cortical areas, Jacksonian epilepsy, Babinski’s sign, the Guillain-Barré syndrome, and Parkinson’s disease. Each contribution provides a short biography of the person or persons recognized by the eponym, discusses the original or key publication that established the name, and considers the subsequent evolution and significance of the eponym.

The essays are generally well written and entertaining. This is the sort of book one can pick up from time to time and consult for specific information, or settle into and read from cover to cover. The range of topics offers a good perspective on the breadth of challenges that have faced neurology, and the depth of each contribution is sufficient to

portray the complexity of the nervous system and, often, the limitations of the clinical method to probe its secrets. Brain-behavior relationships are amply represented, and neuropsychologists will be particularly interested in the accounts of Broca’s aphasia, Gilles de la Tourette’s syndrome, Korsakoff’s syndrome, Wernicke’s aphasia, Alzheimer’s disease, Creutzfeldt-Jakob disease, Huntington’s chorea, and Pick’s disease, among others. Many personal and historical details of neurologic figures are also added, and enhance the value of the text. The book describes, for example, the wide-ranging interests of Broca in anthropology and comparative neuroanatomy, the pursuit of which led to his important work on the limbic system, and his courageous actions amid the turbulent political scene of his day. Also mentioned is the remarkable modesty of Alzheimer in not claiming to have discovered a new disease with his initial neuropathological observations, leaving to Kraepelin the later introduction of the term “Alzheimer’s disease.”

This book succeeds in making its case for the use of eponyms in neurology, although one suspects that the debate on this question will not soon subside. Moreover, another important aspect of this volume is the rich assortment of information on the history of neurology, a story worth telling in its own right. The major value of *Neurological Eponyms* may in fact be to help chronicle the early efforts of neurologists and other neuroscientists to comprehend the mysteries of the nervous system by studying it with the best available method: careful and detailed observation of its structure and function in health and disease. The fact that the names of the observers became affixed to the observations seems reasonable and appropriately scientific, but even if this point is still disputed, it cannot be denied that competent and insightful description is an essential prerequisite to the development of greater sophistication. The impressive neurological advances of our own time would not be possible without the pioneering efforts of so many whose names are remembered from the neurology of the past.

Cerebral Reorganization and Plasticity: From Neuroscience to Rehabilitation

Cerebral Reorganization of Function after Brain Damage, Harvey S. Levin and Jordan Grafman (Eds.). 2000. New York: Oxford University Press. 392 pp., \$55.00.

Reviewed by VICKI ANDERSON, Ph.D., *Department of Psychology, University of Melbourne, Victoria, Australia.*

Cerebral reorganization and functional plasticity are topics central to the practice of neuropsychology. Clinicians are frequently required to make choices regarding the most efficacious rehabilitation methods, comment on recovery and outcome patterns, or predict nature and severity of residual deficits. Unfortunately, insufficient available information makes such judgments problematic at best.

Clinicians and researchers have theorized about these processes for more than a century, but progress has been limited, due to the indirect nature of available research techniques, and the (necessarily) restricted research options for examining human samples. Further, in the past, researchers studying these issues have tended to work in parallel, with little cross-discipline collaboration or communication. This text represents an attempt to overcome this difficulty, integrating discussions that reflect a variety of approaches to the reorganization/plasticity debate, ranging from basic neuroscience models to implications for clinical practice and rehabilitation.

At the outset, the text distinguishes the important, and often confusing, concepts of neural and behavioral recovery and plasticity, providing the clear distinctions to be elaborated throughout the text. Regardless of the basic research model presented, a core theme of each chapter is the identification of interactions occurring between physiological and behavioral dimensions, and in particular, the reciprocal nature of the feedback between these domains. Various authors emphasize that the detection of neural reorganization or plasticity within the CNS does not necessarily translate to better functional outcome and recovery. A number of potential predictors are identified throughout the text, for both neural and behavioral dimensions, including timing of injury, type, size and location of lesion, and nature and intensity of intervention. The immense complexity of the area is emphasized in discussions that argue for different responses to these predictors across both brain regions and cognitive domains. For example, concepts such as critical or sensitive periods for plasticity, diffuse *versus* focal lesions, and differential effects of too much or too little intervention, indicate the multiple determinants of outcome.

The text is written in a style that makes it readily accessible to a range of potential readers, providing sufficient depth and breadth to appeal to a wide audience with an interest in this area, regardless of their degree of expertise

in the specific approaches covered. The inclusion of both research and clinical data provides the reader with an opportunity to evaluate theoretical conclusions *via* consideration of applied data sets. The text is divided into four sections, beginning with current perspectives in the basic neuroscience of cerebral reorganization, moving through developmentally-specific issues and recent advances for investigation of these phenomena, and concluding with comments on the relevance of this work to rehabilitation and clinical practice.

The first chapter provides an excellent introduction, describing the chronology of the ongoing search for answers in this field, and plotting the rise and fall of concepts such as localization and equipotentiality. The authors point to the somewhat surprising commonalities between classical and contemporary views in the field, noting that many of the conclusions from recent empirical research have been hypothesized in past decades, yet without support from the advanced technologies employed today. Chapters 3 to 9 focus on basic neuroscience approaches to these issues. Experimental evidence for functional repair in animal models is discussed, arguing that potential for neural regeneration may be greater than previously thought. Results from pharmacological and behavioral intervention studies suggest that regeneration may be enhanced if input is provided at appropriate stages of the recovery process. Limitations to recovery are noted, with respect to specific brain regions and critical periods of development, and there is discussion whether neural plasticity and reorganization will necessarily lead to adaptive recovery at the level of behavior. Stages of recovery (e.g., diaschisis, behavioral compensation) and potential recovery processes (e.g., collateral sprouting, unmasking of pre-existing neural connections) are also considered.

Section II (chapters 10–13) focuses on developmental issues, particularly the potential for reorganization within the immature CNS. Clinical findings from a range of congenital and acquired CNS conditions are presented. There is some discussion of differences in plasticity and recovery between adults and children. However, the authors acknowledge that this dichotomy is too simplistic, and does not reflect the complexity that exists within the pediatric context. The majority of findings appear to support relatively better recovery following focal brain lesions in childhood and poorer outcome with diffuse lesions, consistent with the classical view that, where there is less healthy tissue,

there is less opportunity for functional reorganization. Timing of injury is also addressed, with differing views expressed with respect to recovery from early *versus* late insult. The notion of critical periods is considered by authors suggesting that specific skills may have varying critical periods, and thus respond differently to insults occurring within the same time frame.

Section III describes contemporary techniques for studying neuroplasticity in humans. The advantages and disadvantages of structural imaging, transcranial magnetic stimulation, functional imaging (PET, fMRI) and computer modeling are all considered. Authors agree that, while many of these techniques have the potential to inform the plasticity debate, the nature and validity of data emerging from these methods is not fully understood.

The text concludes by noting that a primary purpose of the publication is to help develop an evidence-based framework for the development of rehabilitation strategies for individuals with CNS pathology.

This book does not aim to simplify the key issues in this complex domain. Rather, each chapter has identified important advances in the field, and then emphasized the continued limitations to better understanding. Taken as a whole, it is clear that, to date, most neuroscience research has focussed on animal models, and the implications for humans remain untested. Similarly, the bulk of the basic neuroscience literature, which provides us with insights into the possible neural underpinnings of recovery, has addressed recovery and reorganization within motor and somatosensory systems, which, while challenging, may be argued to be infinitely more straightforward than the domains of high-level human thought. Where these latter areas are studied, issues of developmental stage, critical or sensitive periods, and appropriate assessment tools require careful attention. In conclusion, this book represents a valuable contribution to the field of neuroplasticity, providing an integrated and intricate discussion of the ongoing development of knowledge, as well as the challenges for the future.

More Practice Effect Tables for More Effective Practice

Practitioner's Guide to Evaluating Change with Intellectual Assessment Instruments, R.J. McCaffrey, K. Duff, and H.J. Westervelt (Eds.). 2001. New York: Kluwer Academic/Plenum. 280 pp., \$69.95 (PB).

Reviewed by MURIEL D. LEZAK, Ph.D., *Dept. of Neurology, Oregon Health Science University, Portland, OR.*

Clinicians owe a debt of gratitude to McCaffrey and his team for developing not just one (McCaffrey et al., 2000) but now a second set of tables providing an extensive compilation of test-retest data for tests commonly used in neuropsychological assessment. The newest *Practitioner's Guide* presents the retest findings for all four versions of the adult Wechsler Intelligence Scale [Wechsler-Bellevue, the original Wechsler Adult Intelligence Scale (WAIS), and its variants: WAIS-R, WAIS-III, WAIS-RNI], plus the Wechsler Intelligence Scale for Children (WISC) with its variants (WISC-R, WISC-III) and the Wechsler Preschool and Primary Scale of Intelligence. For each of Wechsler's batteries this guide provides retest data for the scores in common use (e.g., IQ, VIQ, PIQ, each individual test, and WAIS-III index scores). In addition retest findings are given for the North American Reading Test, Raven's Progressive Matrices, Shipley-Hartford Institute of Living Scale, and for 13 Stanford-Binet studies (form L-M, judging from study dates; all but five are IQ scores).

The guide is introduced with a thoughtful discussion of the history of intelligence tests, issues relevant to neuropsychological applications, the effects of practice and how they can be controlled, and how demographic variables may affect practice effects. The only thing I found missing were references for the tests themselves. Thus, I had to guess that the NART was the test that Spreen and Strauss (1998) call the North American Adult Reading Test (NAART). This does not take away from the guide's most welcome usefulness, it just requires a bit of detective work from the user.

REFERENCES

- McCaffrey, R.J., Duff, K., & Westervelt, H.J. (Eds.). 2000. *Practitioner's guide to evaluating change with neuropsychological assessment instruments*. New York: Kluwer Academic/Plenum.
- Spreen, O. & Strauss, E. (1998). *A compendium of neuropsychological tests* (2nd ed.). New York: Oxford University Press.

OTHER BOOKS OF INTEREST

(with brief notes by the Book Review Editor)

Dell Orto, A.E. & Power, P.W. (2000). *Brain injury and the family. A life and living perspective (2nd ed.)*. Boca Raton, FL: CRC Press. 232 pp., \$44.95.

“This looks most useful for professionals—those learning about TBI family issues. It would be well-suited to courses on TBI/rehabilitation as there are discussion questions for each chapter.” Patricia Camplair, Ph.D., Oregon Health Sciences University.

Mandal, M.K., Bulman-Fleming, M.B., & Tiwari, G. (Eds.). (2000). *Side bias: A neuropsychological perspective*. Dordrecht, The Netherlands: Kluwer Academic. 350 pp., \$123.00 (HB).

In its exclusive focus on lateralization, this book will be of interest to clinicians and researchers alike. The chapters first trace lateralization of anatomy and function from evolution through developmental contributions and cultural pressures to lateralization’s vicissitudes in old age. Several chapters are devoted to aspects and assessment of handedness, following which other kinds of lateral preference and response biases are examined.

Spencer, P.S., Schaumburg, H.H., & Ludolph, A.C. (Eds.). (2000). *Experimental and clinical neurotoxicology (2nd ed.)*. New York: Oxford University Press. 1310 pp., \$195.

Following an introductory section addressing the biological principles of chemical neurotoxicity, human neurotoxic disease, and aspects of veterinarian neurotoxicology, this book reviews the chemical structure and neurotoxicological research on over four hundred neurotoxic agents, from absinthe to zolpidem. This is an important reference book.

Rapp, B. (Ed.). (2001). *The handbook of cognitive neuropsychology. What deficits reveal about the human mind*. Philadelphia: Taylor & Francis/Psychology Press. 656 pp., \$84.95 (HB).

An impressive cohort of authors—e.g., Max Coltheart, Edward De Haan, Martha Farah, Alan Parkin—provide impressive reviews of the major issues of interest in cognitive neuropsychology, e.g., object recognition, consciousness,

the spelling process, time perception, spatiomotor aspects of action. This is a rich sourcebook, grounded in neuroanatomy, which will satisfy needs for both access to current work and stimulation for future research.

Dupuy, J.P. (2001). *The mechanization of the mind. On the origins of cognitive science*. (M.B. DeBevoise, Trans.). Princeton, NJ: Princeton University Press. 210 pp., \$29.95 (HB).

Dupuy will appeal to interests in the philosophy of science, cybernetics, AI, et al. The translation seems to be exceptionally clear, the writing is lively—a treat for the existentially curious.

Todman, J.B. & Dugard, P. (2001). *Single-case and small-n experimental designs. A practical guide to randomization tests*. Mahwah, NJ: Lawrence Erlbaum Associates. 245 pp., \$59.95 (HB).

Along with theoretical principles and exploration of statistical concepts, this “how-to-do-it” manual gives step-by-step procedures for randomization tests using Minitab, Excel, and SPSS. A diskette carrying the book title is included.

Byrnes, J.P. (2001). *Minds, brains, and learning. Understanding the psychological and educational relevance of neuroscientific research*. New York: Guilford. 214 pp., \$25.00 (PB), \$42.00 (HB).

This is a succinct review of both general scientific and practical aspects of neuropsychological knowledge: brain anatomy and development, memory and attention, emotional disorders, academic skills (reading and math). It is written at a college level and would be an enriching adjunct to introductory courses in general, abnormal, and/or clinical psychology.

Trobe, J.D. (2001). *The neurology of vision*. New York: Oxford University Press. 451 pp., \$120.00 (HB).

This clinician-oriented book contains a lot of information relevant to neuropsychology, such as toxic and nutritional visual disorders, image distortions, denial of sight, or blindness.