duration of therapy, and clearly defined treatments that are reproducible and justified by theory.

The sections on skilled movement, music, and number processing disorders (Section III) and modality-specific recognition disorders (Section IV) focus on the classic neuropsychological syndromes, including forelimb apraxias by Kenneth Heilman, Leslie Gonzalez Rothi, and Brenda Hanna-Pladdy (Chapter 10), calculation and number processing by Xavier Seron (Chapter 12), and visual and auditory agnosias by H. Branch Coslett (Chapter 14) and Marie di Pietro, Marina Laganaro, and Armin Schnider (Chapter 15), as well as more idiosyncratic topics, such as singing as a treatment for aphasia by Sylvie Hébert, Isabelle Peretz, and Amélie Racette (Chapter 11), thought processing problems in aphasia by Jules Davidoff (Chapter 13), and somatosensory recognition disorders by Gabriella Bottini and Martina Gandola (Chapter 16). Most of these chapters include detailed explanations of theoretical concepts, reviews of neuroanatomical substrates, and directions for future research. Experimental and cognitive neuropsychologists especially will appreciate these summaries.

The final two primary sections on neglect, attentional, and executive disorders (Section V) and memory disorders and neurodegenerative diseases (Section VI) are worthwhile reads for both cognitive and clinical neuropsychological researchers. Giuseppe Vallar provides an excellent summary on subcortical neglect (Chapter 17), a topic rarely seen in other neuropsychological texts, with plenty of concrete examples and diagrams. Chapter 18 by Michael Posner on the neuropsychology of attention offers a rare glimpse into thought processes of how and why experimental methods are chosen, which can be applied to other areas of study. The contribution of electrophysiological methods in the investigation of selective attention by Anna Christina Nobre and Laetitia Silvert is the topic of Chapter 19, which provides a terrific overview of key findings, the current state of research using these methodologies, and ideas for future research. Chapters on the frontal lobe by Paul Eslinger (Chapter 20) and Sebastiaan Engelborghs, Peter Mariën, and Peter de Deyn (Chapter 24) and memory by Olivier Piguet and Suzanne Corkin (Chapter 21), Gianfranco Dalla Barba, Francois Boller, and Dorothée Rieu (Chapter 22), and Jonathan Knibb and John Hodges (Chapter 23) provide very nice summaries integrating theory, human studies, and neuroimaging that are comprehensive and well-organized. The chapter on semantic dementia (Chapter 23) is an excellent overview with clinical, histological, and neuropathological features weaved in. Especially helpful is the discussion of differences between semantic dementia, primary progressive aphasia, and the other frontotemporal dementia syndromes.

In summary, *Neuropsychological Research: A Review* is a sophisticated read not for the faint of heart. Though the chapters are generally well-written and succinct, they cover a wide range of material, including theoretical and methodological concepts from experimental and cognitive neuropsychology, clinical case studies highlighting functional neuroanatomical correlates, and evolving technologies in neuroimaging and genetics, and can be dense with terminology. The contributors are clearly experts in their respective areas, and regardless of your experimental background or level of expertise in neuropsychology, you are likely to learn something new and to be challenged to think more broadly about the scientific study of neuropsychological concepts. I did not have the privilege of knowing Professor Vignolo, but after reading this volume, I wish I had. I believe he would be very proud to have his legacy carried forward in this way.

From Cells to Cognition: Understanding Neural Hard Wiring and Plasticity

doi:10.1017/S1355617709990622

Topics in Integrative Neuroscience: From Cells to Cognition. James R. Pomerantz (Ed.). 2008. New York: Cambridge University Press, 448 pp., $140.00 (HB)

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Topics in Integrative Neuroscience: From Cells to Cognition (2008), edited by James Pomerantz, Professor of Neurosciences at Rice University, seeks to provide the reader with a sample of the "sweep of discoveries and advances" that have emerged in neuroscience research during the 1990s 'Decade of the Brain.' He comments that it is "impossible to capture fully the sweep of discoveries and advances that emerged from that decade within a single volume." The goal of this text is to provide a sample of the best of neuroscience work in areas that represent great challenges to our understanding of brain and behavior. Pomerantz specifically identified four areas of importance and invited advanced researchers in each area to contribute chapters in thematically organized sections. The four sections or categories represented in this text are, higher order perception, language, memory systems, and sensory processes.

If there is an overriding theme to this text, it may be best summarized by Squire and Stark, who comment in the introduction to Chapter 9 ('Memory Systems'): "For all its diversity, one can view neuroscience as being concerned with two

central issues – the hard wiring of the brain and the brain's capacity for plasticity." Within each of the four sections individual chapters focus on anatomical systems and plasticity to varying degrees

Part I contains three chapters focusing on 'Higher Order Perception.' Posner and Fan propose that attention can be viewed as an organ system. The basis of this assertion is that there is a distributed system of neural regions which are consistently associated with attention, and that this system shows developmental progression during childhood, including in the emergence of executive self-regulation. The authors review evidence of genetic and environmental processes that shape the development of the attention organ system. The second chapter in this section, by Gilbert, examines a "continuum of experience-dependent cortical plasticity beginning early in postnatal life and continuing through adulthood." He gives a very interesting review leading to the conclusion that neural responses to a particular shape in the environment will likely be unique to each individual based on experience and other factors. Kastner, DeWeerd, and Ungerleider follow with a chapter reviewing neural mechanisms involved in selective attention, with emphasis on both bottom-up and top-down processes.

Part II focuses on research on brain systems important for language functioning. In the section introduction, Helen Neville points out that while animal models have been very powerful in furthering understanding of other cognitive processes, this is not true in the area of language functioning. Alternatively, studies of humans with specific lesions have contributed to more advanced models for language relative to other areas of cognition. In the first chapter of the section, Sanders, Weber-Fox, and Neville provide an intriguing review of developmental plasticity in language systems in congenitally deaf adults and hearing adults who learn a second language. Poeppel and Hackl follow with a review of research on the linguistic and neural bases of speech perception. Patterson et al. follow with a clinically-oriented chapter reviewing the breakdown of language systems in semantic dementia and progressive nonfluent aphasia. In the final section chapter, Mehler, Nespor, and Pena discuss language acquisition in humans, and provide an integrated review of behavioral and imaging data from infant studies. They also discuss data suggesting early hemispheric specialization for language and distinctions between human infants and nonhuman vertebrates.

Part III ('Memory Systems') will likely be the section most familiar to, and comfortable for, clinical neuropsychologists. Squire introduces the section by reviewing seminal developments in increasing understanding of human memory, including clinical studies of single cases such as H.M., and recognition that there are multiple distinct memory systems, and that the ability to study memory at the cellular and molecular level is expanding. The first chapter of the section, by Squire and Stark, provides a concise review of declarative and non-declarative/implicit memory systems. The next chapter, by Ramus and Eichenbaum ('A Brain System for Declarative Memory') provides a more in-depth discussion of how the hippocampus, parahippocampal region, and association neocortex, contribute to declarative memory. The third chapter in this section, by Blair et al., focuses on role of the amygdala in auditory fear conditioning. They review the evidence supporting Hebbian synaptic plasticity in the lateral nucleus of the amygdala in establishing conditioned auditory fear responses. This chapter also includes a brief but interesting discussion of evidence that stable long-term memories can once again become unstable ("labile") when retrieved, and may be lost if not reconsolidated into a stable form. The final chapter in this section, by Nakazawa, Wilson, and Tonegawa, examines the role of NMDA receptions in acquisition and recall of associative memory. They first provide a very interesting review of the technical aspects involved in producing gene manipulations in mice strains in order to selectively study the role of CA1 and CA3 hippocampal regions in establishment and retrieval of spatial memory. The end of the chapter includes a brief inferential section on how these data may relate to the behavioral manifestations of neurodegenerative disorders in adults.

Part IV of this text focuses on studies of the neural underpinnings of sensory processes, examining singing in songbirds and the functioning of hair cells in the inner ear. While it may seem odd to include a chapter on behavioral and neural processes in songbirds, the authors (Solis et al.) point out that human speech and birdsong share many features. They both are learned vocal behavior involving complex acoustic sequences, they involve vocal and respiratory apparatuses, and they both are highly dependent on hearing in early life and adulthood. Further, the developmental acquisition of birdsong and human language has many similarities. Their chapter focuses learning and synaptic plasticity in the anterior forebrain pathway. The final chapter of the text (Wooltorton et al.) focuses on hair cells in the inner ear and research identifying three different types of sodium currents involved.

One additional chapter is included by Patricia Churchland, a professor in the Department of Philosophy at the University of California at San Diego. She begins by commenting "without the assumption of agent control and responsibility, human social commerce is hardly conceivable." Expanding upon this, principles of reinforcement that shape social behavior presume that humans exercise control over their actions. However, are we truly agents with free choice? She reviews both historical philosophical struggles over this dilemma as well as possible consequences of emerging data from the neurosciences. Churchland reaches the following point: "On the whole, it seems to be assumed, social groups work best when individuals are presumed to be responsible agents" directing their own behavior. She raises further questions about the moral implications of neurobiological interventions if it becomes possible to affect criminal or other types of undesirable behavior in much more precise ways than currently possible. Interestingly, this chapter is placed at the front of the text, which implicitly reinforces the integration of neurosciences, philosophy, and ethics.

On one level this text successfully provides a sampling of advanced neurosciences research across several domains. There are very interesting, and at times complex, reviews of studies of the neural underpinnings of behavior. The several chapters that integrate behavioral and neuroimaging studies are also a strong component of this volume. However, the reader may feel that he/she is reading several separate texts within this single volume. This is not a criticism and, in fact, may be viewed as consistent with Pomerantz's introduction, where he describes this text as a sampling across several domains. For the most part this is not a clinically-oriented text, and readers lacking a sound foundation in basic neuroscience and behavioral research may find it difficult. It is however, worth spending the time to read and digest.

An Introduction To Neuropsychology: History And Experimental Evidence

doi:10.1017/S1355617709990634

Introduction to Neuropsychology, Second Edition, by J. Graham Beaumont. 2008. New York: Guilford Press, 382 pp., $45.00 (HB)

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The title of this book accurately reflects its content: an introduction to the discipline, though from a distinct historic and openly opinionated perspective. In light of other available introductory texts, Beaumont's book would not be sufficient as a "stand alone" resource. Neither is it comprehensive or up-to-date enough to be considered an authoritative text. Yet this book makes a valuable contribution to the growing cadre of neuropsychological textbooks available to instructors. It is best suited for use in the classroom to orient students to the discipline and its place in history, and experimental foundations. Given the book's straightforward and accessible writing style, it is quite appropriate for an undergraduate course or as a supplement in a graduate course.

In this second edition, the author builds upon the first 1983 edition by adding an entire chapter on degenerative disorders and profound brain injury, and sections on neuroimaging, rehabilitation, and neuropsychiatry. Throughout the text, he aims to provide a balanced perspective of the field by addressing both scientific and clinical topics. In the course of his coverage, he also explicitly infuses his personal opinion, which adds interest to the content but also takes away from the objectivity expected for such a text. Readers whose opinions differ from the author's will either find such points intriguing or distracting. The integration of his personal comments is often entertaining and sometimes instructive by reminding the reader to remain critical of the current knowledge base in neuropsychology. With regard to the general layout of the book, there are not many diagrammatic representations, but the included choice illustrations are useful and appropriate for the content. The book is notable for its reliance on references to older studies. The author defends his retention of older references, many of which are from the 1970's, by stating, "Psychology, generally, is in danger of losing contact with its rich intellectual heritage, and an appreciation of the history of neuropsychology is critical to a full understanding of contemporary concerns." A valuable aspect of the book, which compensates for both the brevity of some sections and the dated references, is a supplemental, "Further Reading" list at the end of every chapter that serves as an indispensable resource for readers desiring more in-depth coverage on many of the book's topics.

The volume's 16 chapters are organized into three parts. Part one contains two chapters which provide a general introduction to the field, including intellectual warnings against "the fringe" of neuropsychology, which he identifies as theories on consciousness, cultural differences, and occupational/educational adjustment. The author posits that these "ideas" are exciting but lack adequate scientific evidence to warrant serious consideration. This brief section does not elaborate further or include any references. As such, it leaves the reader to wonder what specific aspects of the aforementioned "ideas" he is referring to, especially since several of these areas currently have well-established scientific bases. The absence of greater attention to these areas gives the appearance of premature judgment on relevant and recent, albeit controversial, developments within the discipline. The introduction also presents a summary of North American, Russian, and British historical approaches to clinical neuropsychology, and offers insightful critiques of each. Chapter 2 provides a very brief overview of structure of the central nervous system (CNS). Beaumont begins this chapter with an explanation of anatomical terminology and the protective layers of the CNS, and then proceeds through the phylogenetic divisions of the brain. Missing from this section is a discussion, or even mention, of the cellular structure of the CNS and its chemical basis of communication. He recognizes that this anatomy chapter is "necessarily rather cursory" but explains that it should suffice for the provision of knowledge necessary to understand brain structures that are the target of the remainder of the book. While perhaps true, this