ing of a group of loyal students and colleagues. This book provides another chance to those who have not read nor fully grasped his previous work. I recommend those individuals not familiar with Goldberg's body of work to avail themselves of this opportunity.

Throughout the history of psychology, accounts of the mind have assumed a progression from the laboratory outward. Initial studies focused on sensation and perception. Developments in several fields helped our understanding of language. With new technologies, we developed paradigms that enabled us to tackle the problems of attention and memory. While advances in experimental psychology have had a clear impact on the development of clinical neuropsychology they have left largely unexplained many of our most important psychological capacities, including insight, judgment, and problem solving. For many functions commonly attributed to the frontal lobes, the path of development has been reversed. Many of the modern day conceptions of these executive functions originated in clinical descriptions of individuals who had undergone neurologic damage to the frontal lobes, with the case of Phineas Gage as the most salient example. Goldberg, who is also a seasoned clinician, uses this approach to its fullest, incorporating his experiences with a variety of patients, including those with schizophrenia, Tourette's syndrome, and traumatic brain injury, to add vitality to his systematic account of the executive skills and how they relate to the larger scope of brain functions.

In one of the earlier chapters, Goldberg points out that many popular books now cover the topic of memory and its disorder. Until now, no similar book had been written on the frontal lobes. In the case of memory, we now can say that it has something to do with encoding, storing, and retaining information. Goldberg notes that the functions of the frontal lobes do not fit so neatly into any such soundbite. Many neuropsychologists have had the experience of trying to explain the concept of executive functions to laypersons only to see their eyes gloss over when encountered with the terms organization, planning, and sequencing. Some practicing neuropsychologists have become quite lazy in this regard, by simply equating their discussion of frontal lobe functions with performances on various tests such as the Wisconsin Card Sorting Test, Stroop Test, and Trailmaking Test. Goldberg takes a longer route in his discussion of the frontal lobes, thereby providing a more enriched and practical language to use in describing the functions of this fascinating part of the brain.

In this book, Goldberg goes beyond a discussion of the frontal lobes to other important topics including hemispheric differences and clinical testing procedures. His theoretical account of left and right hemisphere functioning is one of few that escapes the teleological dichotomy of verbal and nonverbal functioning. While his discussion of left hemisphere capacity in terms of descriptive systems may, at first glance, be consistent with most other accounts, it is actually quite different. His depiction of the right hemisphere as mediating responses to novelty also provides a more rich and dynamic account of this oft-neglected part of the brain. He also argues for the need to move from a horizontal focus on left and right hemispheric differences in favor of more vertically and longitudinally oriented conceptions of the brain and its key connections. His description of the differences between adaptive decision-making *versus* veridical decision-making should appeal to those concerned about the limitations and ecological validity of many neuropsychological tests. Goldberg offers a novel means for testing individual styles rather than abilities that, if accepted more widely, could have a significant impact on the field.

By having in mind an audience that is larger than the field of professionals, Goldberg manages to make this book informative, while being highly readable and entertaining. The book progresses with arguments on how an understanding of frontal lobe functions has the potential to enhance understanding of social issues and even some aspects of political organization. He also provides a unique perspective on mental illness in general. Negative points include some repetition. Some might consider the review of the literature to be highly partisan. However, these are minor points that do not detract from the overall quality of the book. Neuropsychologists at all levels of training will benefit from reading this book. Its success in describing very complex issues in simple terms will make this a book that many will recommend to friends and professional colleagues alike.

An Introduction to Human Neuropsychology

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Principles of Neuropsychology, by E.A. Zillmer and M.V. Spiers. 2001. Belmont, CA: Wadsworth/Thomson Learning. 606 pp., $86.95 (HB).

Reviewed by Jeffrey M. Halperin, Ph.D., *Department of Psychology, Queens College of the City University of New York, Flushing NY.*

Education and training in neuropsychology has been primarily directed to pre- and postdoctoral students with numerous excellent books available for these target audiences. However, as indicated by Eric Zillmer in the preface to *Principles of Neuropsychology*, this book is geared toward undergraduates and beginning-level graduate students, a group that in this reviewer's opinion, has received considerably less attention from the field. According to Dr. Zill-

mer, the goal was to "teach brain function in a clear, interesting and progressive manner." This goal was clearly accomplished by the authors in this stimulating, well-organized, and comprehensive introduction to human neuropsychology, which masterfully merges a solid neuroscientific perspective with human interest stories and an array of fascinating clinical vignettes.

The book contains 16 chapters, organized into five parts. Part One, provides a highly engaging overview of the history of neuropsychology and conceptualizations regarding brain function. The evolution of modern thought is traced back to antiquity, where trephination or the removal of skull tissue was practiced, to ancient Greek perspectives on brain function, through the middle ages and Renaissance, to early European perspectives of Gall, Freud, Broca and Wernicke. More current issues surrounding models of localization *versus* equipotentiality are reviewed and the section ends with the emergence of more modern conceptualizations as put forth by giants in the field such as Luria, Teuber, Halstead, Reitan, Geschwind, Benton, and Lezak.

Part Two, entitled "The Functioning Brain," contains five chapters that offer a remarkably in-depth introduction to neuroscience addressed to novices in the field. The reader is first introduced to the basic building blocks of the central nervous system such as neurons, glia cells and astrocytes, as well as physiological mechanisms such as the blood brain barrier, action potentials and synaptic transmission. The organization and anatomy of the nervous system is described in detail with regard to bone structure, the ventricular system, the vascular system, and the major subdivisions and structures of the brain. Separate chapters include "Sensory-Perceptual and Motor Systems," "Higher Functional Systems," and "Methods of Investigating the Brain," the latter of which covers an array of techniques ranging from neurohistological/staining procedures to the most current neuroimaging technology. These chapters include numerous figures depicting virtually all key domains as well as fascinating clinical case material that highlight what might happen when things go wrong. In all, this section provides a very readable, yet quite sophisticated and detailed review of the human central nervous system.

Part Three focuses on the developing brain and highlights differences between child and adult brains. The process of neural development from conception to adulthood is reviewed as well as the emergence of neuropsychological/cognitive functions throughout development. Issues surrounding vulnerability and plasticity of the developing brain are discussed and the reader is introduced to an array of teratogens that can have an impact on neural development.

Developmental disorders are discussed within the domains of abnormalities of anatomic development, chromosomal and genetic disorders, and acquired disorders, with hydrocephalus Turner's syndrome and fetal alcohol syndrome serving as detailed examples in each of the three domains. Learning and neuropsychiatric disorders of childhood are reviewed with particular focus placed on learning disability subtypes, the autism spectrum disorders, and attention deficit hyperactivity disorder. While a thorough presentation of developmental neuropsychology is beyond the scope of this book, the authors provide a seamless weaving together of data, theory, and clinical material that yields an interesting and highly informative picture of key issues in the field.

In many respects, part 4 distinguishes this text from most other neuropsychology textbooks. Rather than reviewing typical functional domains, such as disorders of language, memory, or perception, five chapters on disorders of the brain focus on cerebrovascular disorders, tumors and traumatic head injury, normal aging and dementia/Alzheimer's disease, subcortical dementias, and alterations in consciousness. These highly informative chapters rely heavily on the basic neuroscience that the reader will have already learned in part 2. This exposition of the nature of cognitive/neuropsychological deficits that emerge from the various pathologies, would not be meaningful with less sophisticated groundwork.

Finally, part 5, "Neuropsychology in Practice," covers neuropsychological assessment, interpretation and diagnosis, and recovery, rehabilitation and intervention. I found this section somewhat weaker than the earlier parts of the book, and a bit too focused on "what the neuropsychologist does." However, this limitation is acceptable when one considers the intended audience. Overall concepts regarding assessment and treatment are provided, but there is only limited detail regarding how these clinical tasks are accomplished.

This book can provide an excellent overview for graduate students specializing in neuropsychology. However, such students need greater detail, presented in four or five distinct courses. Still, this is an outstanding text for either high-level undergraduate students or nonneuropsychology graduate students who want some familiarity with human neuropsychology. This book could serve as the basis for a wonderful course on the biological basis of behavior, which is a requirement in most psychology graduate programs. In particular, graduate students in clinical, counseling, or school psychology programs will likely find this text extremely informative and considerably more relevant to their work than the more traditional physiological psychology or behavioral neuroscience text.

In addition to its clarity and breadth, this book has a number of additional attributes. Each chapter begins with a section entitled "Keep in Mind," which poses a series of questions that the reader should think about while reading through the chapter, and each chapter ends with a series of "Critical Thinking Questions," which are answered by the authors at the end of the book. In addition, each chapter ends with a listing of key terms defined in a glossary at the end of the book. Citations for web connections that can be used to expand knowledge are provided. Further, each chapter contains several "Neuropsychology in Action" inserts which provide real life examples of clinical cases and situations that bring the material to life.

Overall, I have nothing but kudos for the authors of this book, who have produced a truly solid introductory text to human neuropsychology that is firmly grounded in neuroscience, yet will interest and excite even the most clinically oriented students.