

## BOOK REVIEWS

### **Toward Integrating Cognitive Neuroscience: One Method Deserves Another**

DOI: 10.1017/S1355617708080466

*Methods in Mind*. Carl Senior, Tamara Russell, and Michael S. Gazzaniga (Eds.). 2006.  
Cambridge, MA: The MIT Press, 394 pp., \$55.00 (HB)

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In the preface of *Methods in Mind*, the editors express their intent to provide a text that integrates different cognitive neuroscience methods. The chapter authors were given the lofty charge of describing their method of choice, considering the method's strengths and limitations, and how other methods might be integrated. By-and-large, the editors have achieved their goal.

Stewart and Walsh provide a basic review of transcranial magnetic stimulation (TMS) methodology and of its usefulness to produce a temporary lesion model in the study of human cognition. They emphasize that TMS may have research applications for testing whether brain regions identified through other functional neuroimaging methods are necessary for an experimental task. They then review visual-perceptual research conducted with TMS that provides a good introduction to this method.

Humphreys, Heinke, and Yoon provide an introduction to cognitive neuropsychology and computational modeling. They give a helpful overview of why this approach can be useful in neuropsychological research, although the technical details of the method are not really described. They demonstrate how computational modeling can be used in experiments to dissect perception and language.

The chapter by Naqvi and Bechara on skin conductance is excellent. The topic is reminiscent of studying galvanic skin response in graduate school, and this chapter deserves a "good read" by cognitive neuroscientists. The authors provide a technical overview, and then a concise discussion of why and how skin conductance can be used for research on decision making.

Henderson's chapter on eye movement research summarizes why this method has been, and still is, an important means of investigating cognition. It is an enjoyable read that covers the history of eye movement research, and then basic principles to consider in eye movement experiments. Henderson ends with a brief discussion of the method's limitations, and how it might be integrated with functional magnetic resonance experiments.

Bandettini provides an authoritative and excellent overview of functional magnetic resonance imaging (fMRI). While enthusiastic, the chapter is appropriately cautious in describing the usefulness and limitations of fMRI. Blood-oxygen-level-dependent (BOLD) and perfusion contrast methods are covered, and the physics involved are explained in a reader-friendly style. Bandettini provides a necessarily brief but useful commentary on the potential for integrating electroencephalography, magnetoencephalography (MEG), TMS, and various physiological measures (including skin conductance) with fMRI.

Rippon reviews the history of electroencephalography (EEG), and basic methods. While not really an EEG primer, the reader is informed of various types of electrographic phenomena and of their neuroanatomical, and to some extent, functional correlates. Important event-related potential phenomena are reviewed in more detail including the N100, N300, and N400 wave forms. Finally, Rippon devotes several pages to cognitive neuroscience questions about EEG, such as how certain wave forms, or underlying neural activity, support cognitive processes. While this is an area of my own particular interest, I think that this chapter might pique the research interest of neuropsychologists and clinical cognitive neuroscientists who could potentially collaborate with an EEG laboratory.

The chapter on "Imaging Genetics" by Mattay, Meyer-Lindenberg, and Weinberger truly integrates imaging using fMRI and magnetic resonance spectroscopy (MRS) with genetics. The authors provide a discussion of methods, and then examples of how imaging has been used to study a metabotropic glutamate receptor gene, apolipoprotein-e, brain-derived neurotrophic factor, and others. Hall and Adjamian later provide a chapter on "The Chemistry of Cognition." They provide a useful introduction, on a mainly conceptual level, about how techniques such as MRS, MEG, positron emission tomography (PET), and fMRI can be used to study pharmacologically influenced or related brain function. It might have been useful to place this chapter just

before the Imaging Genetics chapter, and after the fMRI chapter. Hall and Adjamian provide brief reviews of papers that investigated emotions or cognition with pharmacologically related imaging techniques.

Singh's chapter is not the last in this volume and it is certainly not the least. It was a pleasure to read this chapter that begins with necessary discussion of temporal and spatial resolution of the MEG technique, and then provides a technical review of the methodology. While there is some technical material that touches on the physics of the technique, it is sufficiently described in conceptual terms so that the reader can "get their head around" the subject matter. The chapter includes discussion about integrating MEG with EEG, and coregistering MEG with anatomical MRI, and some consideration is given to associating MEG with fMRI.

The chapter authors of *Methods in Mind* attempt to integrate a collection of neuroscience research methods and

ideas within a single volume. They provide good overviews, some more technical and some more conceptual, of their chosen neuroscience techniques. The clinical neuroscientist who is curious about these various techniques and what they offer, the cognitive neuroscientist looking for an introduction to less familiar techniques, and the graduate student will all appreciate this volume. Clinical applications are mentioned, but this is really a book about research methods. As a clinical neuropsychologist, I have to wonder if this book does not predict what we will be doing in the future. If you choose not to put this book on your shelf, then go find it in your library and read some of the chapters. Clinical neuropsychologists may need to better understand and appreciate these neuroscience methods, especially as these techniques become more applicable to clinical work in the future.

## The New Gold Standard

DOI: 10.1017/S1355617708080478

*Assessment of Malingered Neuropsychological Deficits*. Glenn J. Larrabee (Ed.). 2007. New York: Oxford University Press, 540 pp., \$69.50 (HB)

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Developments in the area of malingering detection parallel several of Thomas Kuhn's observations concerning the non-linear trend of progress in the history of science (Kuhn, 1962). For example, the naive assumption that traditional neuropsychological assessment procedures would straightforwardly generalize to compensation-seeking populations characterized an earlier status quo, a period Kuhn referred to as *normal science*. The central fallacy of this assumption was the idea that litigants and other claimants did not, as a group, behave differently from those seen in strictly clinical settings. The untenable presumption that astute clinicians were generally capable of forming accurate judgments about the validity of effort on the basis of observation was another *received belief* that characterized this now archaic era of practice.

Sparked by surprising insights derived from the clinical application of the binomial theorem, the field of neuropsychology entered a new developmental epoch. The rapid expansion of awareness of *anomalous* data and the discovery of novel facts defined this developmental stage, all of which posed an enormous challenge to preexisting *paradigms*. Beginning with the early case study approach of Pankratz et al. (1975) and followed by the work of Pankratz et al. (1987) and Hiscock and Hiscock (1989), it became clear that people sometimes perform close to or below chance-level on simple forced-choice measures for reasons not explained by intellectual limitations or neurocognitive impairment. These early studies triggered a transforma-

tional period in our field, translating to a conceptual revolution or *paradigm shift* in the Kuhnian sense (Kuhn, 1962).

As Kuhn (1962) pointed out, a field's textbooks must be rewritten in the aftermath of a scientific revolution. Fortunately, particularly for those on the *front lines* of forensic neuropsychology practice, Larrabee's *Assessment of Malingered Neuropsychological Deficits* reflects the collective effort of many of those who have produced much of the most original and significant research in this area. These authorities provide overviews of the entire malingering research infrastructure, including detailed summaries of evidence-based assessment procedures and considerations of future trends in the definition and detection of malingering. The tables alone are worth the price of admission, and the book follows a highly coherent organizational scheme, making it easy to find pertinent facts and figures. The book is an immediately indispensable resource for every neuropsychologist working in or interested in working in the forensic arena.

Chapters 1 and 2, by Larrabee and Larrabee and Berry, respectively, discuss definitions, research designs, base rate issues, and the fundamentals of classification accuracy statistics. Some readers may object to the fact that other authors revisit the topics of research design and classification statistics in subsequent chapters, but others, especially those who are not fully conversant with the sophisticated quantitative procedures upon which much of this research is based, will benefit from some degree of overlap across instructors.