

## Book Review

### *Visual Word Recognition*

Edited by JAMES S. ADELMAN (Hove: Psychology Press, 2012)  
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£75.00

This edited two-volume set offers an informative and comprehensive overview of current issues in visual word recognition research. The chapters are written by experts in the field and illustrate the range of high-quality studies that have led to our current understanding and outstanding questions regarding the visual and lexical processing of printed words. James Adelman has done an admirable job in bringing together a diverse group of prominent figures in a well-organized set of chapters. The style of the chapters is also quite diverse, ranging from opinionated first-person accounts to wide-ranging reviews of evidence and discussion of cutting-edge computational and statistical modelling approaches.

In Chapter 1 (Coltheart), we find interesting historical notes straight from the horse's mouth along with some idiosyncratic route counting in reading models and the insider's view on one of the major computational modelling approaches to word recognition, the dual-route cascaded (DRC) model. In the highly specialized Chapter 2, Sibley and Kello review recent and ongoing work on the orthographic sequence encoder, a relative newcomer in the field of computational modelling approaches. In Chapter 3, we are treated to serial search models using bins, clamps, unit banks, and other components of cognitive theorizing from ages past. Forster illuminates issues that used to occupy researchers' minds not so long ago, such as how many searches can be carried at once and how many entries can be accessed in parallel? In Chapter 4, Gomez discusses models of the decision stage of the lexical decision task, including mathematical and computational approaches. After a brief historical review, the multiple read-out, the Bayesian reader and especially the diffusion model are presented in some detail.

In Chapter 5, Balota and colleagues defend and describe the 'mega-study' approach, in which tens of thousands of words are presented in lexical decision and naming tasks to hundreds of participants, producing huge datasets that can be subsequently mined for a wealth of information. In conjunction with recent advances in statistical modelling, these developments offer unprecedented potential to investigate the effects of a multitude of lexical and sub-lexical variables. Chapter 6 (Adelman) consists of two parts. The first is about variables to control in word recognition experiments, from a rather Anglo-centric point of view. The second is about statistical models to examine the effects of these variables, focusing on recent developments in linear mixed-effects models. The attempt to explain the rationale of these statistical approaches is very welcome though the uninitiated may find it difficult to follow through the equations and examples.

In Chapter 7, Brysbaert and colleagues examine the issue of split fovea and inter-hemispheric communication, taking into account both anatomical and functional considerations. They discuss the implications of the 'anatomical divide between the left and the right brain half' for the first stages of visual processing in word recognition,

such as the need for early integration of letter information. Chapter 8 then follows up with a discussion of word shapes, discussing the need for both low- and high-spatial frequency information, coarse and fine orthographic specification of letter identity and position. In a very interesting presentation, Grainger and Dufay go over the issues of parallel recognition of multiple individual letters, crowding, and position coding, as features of the 'front-end' of visual word recognition. One step further in the process, Chapter 9 discusses the notion of orthographic similarity and lexical neighbourhoods. The definition of neighbours and neighbourhood density remains a thorny issue. Davis presents a review of neighbourhood effects on both words and non-words, in naming, lexical decision and semantic categorization tasks, concluding in favour of interactive activation. Volume 1 closes with a chapter on the role of phonology in visual word recognition, in which Halderman, Ashby and Perfetti suggest that phonology is activated early, universally across writing systems, and includes representations of phonemes, syllables, features, as well as phonological word identities.

Volume 2 begins with a chapter on morphological processing. In a coherent and succinct presentation, Feldman discusses form- and meaning-based approaches, the interpretation of a variety of priming effects, and the importance of controlling variables, highlighting the weaknesses of dual-route and decompositional accounts. In Chapter 2, Pexman discusses semantic effects on word recognition and shows that a variety of semantic dimensions are independently and jointly activated in lexical processing. Chapter 3 is concerned with the notion of lexical priming, enumerating tasks, theories, types, and individual differences. Jones and Estes present a well-organized—if somewhat Anglo-centric—survey of the field, focusing on method.

The following two chapters are concerned with the study of eye movements. Here the field of individual word recognition interfaces with the field of reading insofar as eye movement models are explicitly concerned with processing of multiple words within a sentential context. In Chapter 4, Shotter and Rayner introduce the reader to the study of eye movements in reading, presenting basic patterns, findings and main issues, concluding with an informative section on the serial versus parallel debate. Then in Chapter 5, Heister, Würzner and Kliegl follow up with an application to modelling eye fixation data from a very large dataset. They explain model parameters and fixation types, going into some detail into the statistical model and its interpretation, thereby illustrating both the potential and the complexities of modern mixed-effects analyses.

Chapter 6 introduces bilingual word recognition. Schwartz and van Hell discuss cross-language effects, including activation of cognates and orthographic and phonological neighbours, language selection and biasing from semantic and syntactic context, and similarities to within-language effects of context on ambiguous words. Then in Chapter 7 Andrews touches on a relatively neglected topic, namely individual differences in word recognition among skilled readers. Based on the notion of lexical quality and associated measures such as fluency, vocabulary and spelling, she considers the role of experience in representational refinement and processing efficiency, as evidenced in context reliance and masked form priming. Subsequently, in Chapter 8, McClung, O'Donnell and Cunningham focus on

orthographic learning, which is necessary for reading in addition to phonology and phonological awareness. Based on the self-teaching hypothesis for the development of the orthographic lexicon, they discuss the role of context, task (aloud or silent reading), and semantics, across languages.

Volume 2 concludes with two chapters about reading difficulties. In Chapter 9, Ahmed, Wagner and Kantor define dyslexia appropriately as the 'low end of normal variation' and go on to describe the main theories and predictive measures associated with failure to learn to read, as well as various myths related to dyslexia, followed by an inconclusive but informative discussion of subtypes. Finally, in Chapter 10, Stein suggests that dyslexia is caused by dysfunction of the magnocellular brain system, an idea that attracted research interest in the past but here seems to flounder amidst biological jargon and unreplicated or unpublished studies. Covering a wide range, from autoimmune abnormalities and coloured lens treatments to fish oils, this chapter might best have been omitted.

Overall, the two-volume set will be an excellent resource for word-recognition researchers, graduate students and undergraduates taking advanced courses. Most chapters present up-to-date information in a clear and engaging style and will serve to familiarize

newcomers with a comprehensive range of study fields related to visual word recognition. In addition, they can help more seasoned researchers navigate adjacent fields, understand what are the critical issues currently in the forefront of research, as well as find organized sets of references to important recent work. Practising clinicians may find some theoretical ideas of interest but probably no direct relevance to their everyday work.

Production quality is good, as the binding feels sturdy and the fonts easy to read. Each volume includes an author and a subject index. Additional care in copyediting, table setting and proof checking might have been possible, as a variety of minor glitches are dispersed among the chapters. Finally, it seems unfortunate to this reviewer that this excellent resource has been split into two separate hard-bound volumes and priced accordingly. Hopefully, a single-volume edition in paperback binding will appear soon that can be affordable to a wider international audience, including students.

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