
Reviews

Tutorials in visual cognition edited by V Coltheart; Psychology Press, Hove, East Sussex, 2010, 405 pages, £40.00 (£36.00 online, US \$67.50) ISBN 9781848728530

I can only assume that many graduates who choose to take up projects in the field of visual cognition at some early point share the same sense of intimidation arising from the limitations of their experience. A comment in the rear cover text for *Tutorials in Visual Cognition* refers to an explosion in research on visual cognition in recent years; something that quickly becomes apparent to new postgraduate students and researchers who discover that undergraduate programmes can only begin to scratch the surface of the range and depth of research being carried out in the domain. Whilst introductory textbooks sufficiently cover many of the fundamental principles of visual perception and attention, there is a long way between this level of explanation and getting to grips with current directions in research in the area.

This is a gap that *Tutorials in Visual Cognition* aims to fill, containing introductory review chapters on twelve selected topics by authors in the respective fields. Though the chapters can be read independently, there are a couple of overarching themes which group some of them together. Given the breadth of the field, providing a comprehensive coverage of everything in the realm of visual cognition in 405 pages would be an impossible task, so it is worth considering the inclusions and absences in the book's selection.

The first chapter proper after the editor's introduction (chapter 2) introduces the idea of re-entrant processing in the context of vision, which in several ways also frames the approach which many of the following chapters take. Approximately half the chapters explicitly cover aspects of visual-spatial attention, be it in the context of voluntary vs involuntary attention (chapter 3), top-down vs bottom-up processes (chapter 4), modelling selective attention (chapter 5), the relationship with short-term memory (chapter 7), and attentional capacity and enhancement in detection tasks (chapter 9). Two of the chapters (10 and 11) address face processing, covering aspects that one (at least, from one who does not specialise in the field) would expect, such as the question of their uniqueness, their processing, detection, and identification. The final chapter (chapter 13) draws upon many of these chapters to discuss visual memory, and the dissociations between the persistence of visual information in different forms. The remaining three chapters are somewhat more dissociated from each other and the rest of the book (though attention still features prominently), covering the implications and effects of eyeblinks on visual cognition (chapter 6), repetition blindness in rapid serial visual presentation (chapter 8), and the spatial representation of numbers (chapter 9).

The prominence of attention-related topics is unsurprising, with the chapters included covering most of the 'usual suspects' that one would come across by scanning the contents lists of a few vision journals. Perhaps the most notable omission to me is that there is no dedicated chapter on eye movements, though they are discussed in the context of the other chapters. As my own interests span this topic, I personally welcomed the coverage of the relationship between attention and working memory in the visual domain, both in the dedicated discussion in the chapter by Pierre Jolicoeur and colleagues, as well as in the final chapter by Max and Veronika Coltheart. Interestingly, a large portion of the editor's chapter on repetition blindness in rapid serial visual presentation would not be out of place in a language text. These may seem like somewhat of a diversion for those with a mind for more 'pure' visual topics, though it highlights the increasing overlap between domains in psychology, to which I feel the introduction will serve new postgraduates well for the future.

Perhaps even more so, I enjoyed Vincent Di Lollo's chapter on reentrant processing, as well as David Irwin and Laura Thomas's eyeblink chapter. Di Lollo's chapter provides a brief history and accessible introduction to a topic that frames his, and potentially a great deal of other, research both in vision and other domains. The eyeblink chapter I enjoyed simply because it prompted thought and questions about things I hadn't previously considered, which is what a book aimed

at this level should do. Rather than giving the impression of a field with either all or none of the answers, a book targeting early career researchers should work towards putting them in a position where they can generate their own questions, and to this end *Tutorials in Visual Cognition* succeeds fairly well. I would have liked to see this encouraged more from a tutorial perspective, in that the chapters might benefit from more explicit prompting of questions or methodological details for those interested in further exploration, to set it apart from what one might gain from reading recent review papers in the respective areas.

In a book aimed higher than an undergraduate level, one might question what it is that perhaps places it out of such a level of understanding. For the most part, general familiarity with the concepts and methods discussed is sufficient. There is an assumption that the reader is familiar with things like EEG, visual search paradigms, and some psychophysics, whereas some of the more fundamental theoretical concepts (eg endogenous/exogenous and top-down/bottom-up distinctions in attention) are introduced briefly, but not to the extent as would be covered in an introductory text. Those for whom these concepts are novel may have trouble getting to grips with the discussions which build on them, but final year undergraduates carrying out a research project should still benefit from a relevant chapter. Similarly, though several chapters draw heavily on psychophysical and neuropsychological evidence, the book is not a primer on either of these approaches. Many of the topics covered could easily be addressed from a more complex/specialist perspective, particularly in regards to the computational or neurological aspects of the topics covered, but explanations are kept well in the scope of a general psychology background. Philip Smith's chapter on the detection of weak visual signals is probably the heaviest in terms of mathematical formulae and models, but even here it feels neither unnecessary nor overwhelming.

The book's selling point is also perhaps what might put off many readers; as it consists of more detailed reviews in distinct topics, it is unlikely that more than a couple of the chapters will be directly useful to a given research project. Those with a single topic in mind would probably benefit more from a more highly specialised text. In addition, in contrast to broader texts which will likely see more usage in the long term, this focus does not lend itself for use as a general reference. What *Tutorials in Visual Cognition* provides is an opportunity to step back from one's own specialism and take a broader look at visual cognition, which anyone working in a large research group, or planning to remain in research in the long term, would do well to take the time to explore. Furthermore, senior academics who regularly supervise projects spanning the areas discussed, and departments/libraries with at least a moderate focus on visual cognition research, would benefit strongly from having this text available as a starting point for their postgraduate students.

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Sounds and perception: New philosophical essays edited by M Nudds, C O'Callaghan; Oxford University Press, Oxford, 2010, 280 pages, £35.00 (US \$65.00) ISBN 9780199282968

Can introspection teach us anything about the perception of sounds?

How do we experience sounds? A new book edited by Matthew Nudds and Casey O'Callaghan *Sounds and Perception: New Philosophical Essays* addresses this question using a largely phenomenological approach to sound perception. This collection of thought-provoking philosophical essays contains chapters on particular aspects of sound perception, as well as a series of essays focusing on the issue of sound location.

The chapters on specific topics include several perspectives on how we hear speech, one of the most well-studied aspects of auditory perception in empirical research. In his provocative essay, Barry C Smith defends a strong top-down account of speech processing, arguing that linguistic meaning is 'read into', rather than 'read off' speech sounds. In a second essay on speech perception, Christopher Mole provides a brilliant example of the benefits of integrating insights from psychology and philosophy. Mole offers an elegant philosophical deconstruction of several instantiations of the motor theory of speech perception (eg Liberman et al 1967; Liberman and Mattingly 1985). This theory continues to be questioned by speech researchers

working in psychology and cognitive neuroscience (eg Hickok 2010; Scott et al 2009), but Mole's criticism is at a different level, outlining how, taken to their logical conclusions, the claims of the theory turn out to be either trivial or impossible. The essay is accessible and should be of interest to both proponents and critics of the motor theory of speech perception and related theoretical accounts. In addition, this section of the book contains a highly enjoyable piece on hearing silence by Roy Sorensen, and a thesis by Andy Hamilton on how we hear music, including an interesting historical review of the idea of acousmatic listening.

Slightly disjointed from these chapters, most of the book consists of a series of essays approaching the experience of hearing sounds by focusing on where sounds are in space. An impressive range of opinions on this issue is presented, likely thanks to the fact that the book's editors represent dramatically different viewpoints. The two main approaches are the 'source-based' and 'wave-based' accounts, differing in where they consider sounds to be located in the causal chain leading from the source to the listener. In addition to these perspectives, a hybrid theory is proposed by Roger Scruton.

The wave-based view argues that sounds are located near the perceiver, although the sounds also provide information about objects around the listener, including the source of the sound. In his enjoyable account, Matthew Nudds proposes that sounds are instantiated where we hear them, which differentiates the sounds from their sources. He argues that, although we do not hear the sounds themselves to be anywhere, spatial information is extracted about the source of the sound, a view that fits well with empirical findings. In a later chapter, Brian O'Shaughnessy makes an attractive analogy between hearing sounds and seeing light, arguing that neither of these perceptual experiences can occur at a distance.

In contrast, the source-based view holds that sounds are experienced as near or at their sources. Proponents of this account, including Casey O'Callaghan, Roberto Casati, and Jerome Dokic, argue that sounds should be thought of as events (something vibrating) rather than physical objects (vibrations or sound waves). When we have the subjective experience of hearing a sound-event, we perceive it to be where the sound was generated. In fact, the only way for us to perceive location information is via the sound, which must thus be heard as located. In this view then, sounds are events that occur close in spatiotemporal proximity to their sources. This account seems difficult to reconcile with scientific accounts of what sounds are and how we perceive them, although the editors note in their introduction that they and the other authors are not denying the scientific reality of sounds being travelling waves that are transmitted through a medium, perceived when reaching the listener. The difference can be attributed to the philosophers' interest in the subjective experience of hearing a sound, contrasting with empirical scientists' focus on the causes and effects of sound, although the phenomenological accounts sometimes appear to reach beyond the merely experiential aspects of sound perception.

The phenomenological account employed by proponents of both the wave-based and source-based views is questioned in the last chapter of the book, where psychologist Robert E Remez and philosopher J D Trout launch a scathing attack on the use of introspection in the intellectual inquiry of sound perception. They argue that the value of introspection needs to be verified by independent methods, and they suggest that this would be unlikely to provide much support for phenomenological accounts. Remez and Trout claim that "Given the psychological opacity of most perception—even aspects of its output—we cannot infer that a psychological function does not exist just because we are unable to detect it upon introspection or reflection" (page 258). They illustrate this problem with the example of semantic priming, a robust effect that changes subjects' perceptions but into which they typically have no insight. Remez and Trout's discussion of the disconnect between introspective and empirical methods also highlights to the reader the problem of philosophers cherry-picking empirical findings that fit with their introspection-based conclusions, rather than considering introspective information as an additional source of data to be evaluated against the broad literature of empirical findings. The points that Remez and Trout raise are relevant to the other essays in the book and these authors would no doubt have interesting contributions to make on this topic; it is unfortunate that the issue is mentioned only briefly in the Introduction. Here, the editors acknowledge that additional methods should be used in conjunction with introspection, but they argue that theories of perceptual experience should nevertheless respect phenomenology. Although this is an intuitively valid point, it is undermined by one of the strengths of this book, namely the diversity of opinions represented by

the contributing authors. With such a range of views derived largely from the same introspective methodology, it remains unresolved which phenomenological account is to be respected.

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