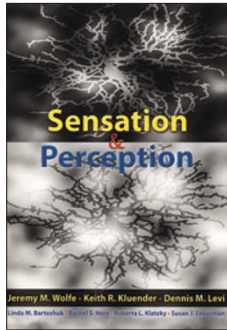


A perceptive new textbook



Sensation & Perception

by **Jeremy M Wolfe, Keith R Kluender, Dennis M Levi, Linda M Bartoshuk, Rachel S Herz, Roberta L Klatzky & Susan J Lederman**

Sinauer Associates, 2005.
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Reviewed by David Burr

All good schools of psychology offer a course in sensation and perception, for obvious reasons: to begin to understand the workings of the mind, we need to understand how it acquires and processes sensory information and constructs our rich perceptual world. Textbooks on the topic abound, of variable but generally good quality. Now another choice has hit the market.

The first thing you notice about this book is that it has as many authors as a neuroimaging or molecular biology paper, but here all have clearly made valuable contributions. The authors are acknowledged leaders in their fields and bring to the text the clarity and passion that comes only from an enthusiast actively engaged in hands-on research. Whereas many sensation and perception textbooks are authoritative only on certain aspects of perception, this text thoroughly and expertly covers most aspects of all five senses. Half the text is devoted to vision (as is nearly half of our cortex), but the other senses are by no means neglected.

Writing a textbook, or even teaching a course on perception, is no easy matter. Although the front end of perception (often termed 'sensation') is now generally well understood, it remains far from clear how rudimentary sensory signals are elaborated to yield the rich and dynamic three-dimensional representation of the world that we effortlessly perceive and interact with. A textbook therefore needs to embrace two distinct styles: one explaining the undisputed but often complex facts about the stimuli, their transmission and transduction; the other discussing critically the research efforts aimed at understanding mid- and high-level perception. The latter part is the challenge, as it is easy to fall either into an uncritical acceptance of plausible but unproven theories, or into the negativity that pervades much of cognitive psychology with the implicit assumption that a mechanistic explanation is impossibly difficult, therefore inappropriate. I think the book treads this fine line well, putting problems into context and discussing strengths and weaknesses of various modern theories (although I expect many perception scientists will inevitably complain

that their own work has been overlooked). To the authors' credit, they have avoided the traditional chapter entitled "Visual Illusions," a cheap crowd pleaser that generally teaches very little about how the brain works. There are visual illusions interspersed throughout the book (including an excellent one on the front cover) as well as auditory illusions online, but they all serve to illustrate specific aspects of perceptual processes and point toward the underlying mechanisms.

Undergraduate textbooks need to keep facts clear and accessible (and examinable), while avoiding oversimplification. I believe that Wolfe and colleagues have again found the right balance. They do not shy from the hard but essential physics and neurophysiology needed to describe physical stimuli and their transduction, and at the same time they manage to avoid superfluous and distracting details, defining all technical jargon in the margins. I do not think that this approach has led to unacceptable or misleading simplification, nor to significant factual errors. In many chapters, the science is related to practical and interesting issues like music, art, the need to wear glasses and the "pleasure of sensation." For the keen student or teacher, further material is available online, along with myriad demonstrations and exercises (not all available at press time).

One big advantage of this textbook is that it has been written afresh, taking onboard the significant conceptual and technical advances in perceptual science in recent years, such as functional imaging techniques and clever but rigorous psychophysical methods. Most textbooks have alluded to the modern developments in revisions, but the organization of the books remains essentially unchanged and often inappropriate. Here all chapters are well organized from the point of view of current knowledge, without lingering unnecessarily on superseded theoretical viewpoints and outdated experimental evidence.

So can we fault this book? It suffers from a common problem of multi-authored texts, that the style is inhomogeneous: some chapters include an array of references every couple of sentences, while others take a more didactic approach. More importantly, there is little cross-referencing from one chapter to another. Many principles and experimental techniques are common to all the senses—such as adaptation, gain control, filtering and selective masking—but these tend to be discussed separately for the various senses, without drawing the obvious parallels and making the important point that the brain tends to reuse its successful strategies. It would also be valuable to discuss the problems of combining information across modalities to yield a robust and unified perception, taking advantage of the different efficiencies of the five senses (as no single modality is optimal under all conditions). There are some sporadic references to this important issue, such as the example of combining touch and vision in chapter 12, but this is not related to a previous chapter explaining the Bayesian approach for combining visual depth cues (even more appropriate for cross-modal integration). However, these are minor issues that could easily be attenuated by updating the online information, and can be fixed on the first revision.

Altogether, this is an excellent textbook: beautifully presented, well written, authoritative and up-to-date, certain to tweak your students' curiosity for this inherently fascinating topic. I certainly intend to have it translated into Italian for my own perception course in Florence. ■

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