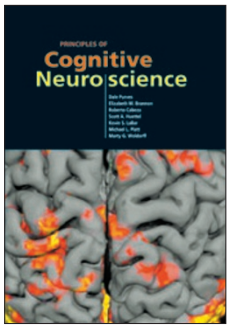
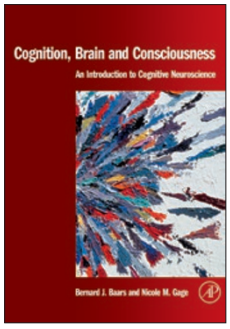
Cognitive neuroscience: new kids on the block?



Principles of Cognitive Neuroscience

by Dale Purves, Elizabeth M Brannon, Roberto Cabeza, Scott A Huettel, Kevin S LaBar, Michael L Platt & Marty Woldorff

Sinauer Associates, 2008
500 pp, hardcover, $97.60
ISBN 0878936947



Cognition, Brain and Consciousness: An Introduction to Cognitive Neuroscience

Edited by Bernard J Baars & Nicole M Gage

Academic Press, 2007
568 pp, hardcover, $79.99
ISBN 0123736773

Reviewed by Clayton Curtis & Lila Davachi

The nascent field of cognitive neuroscience has become a ubiquitous and critical component in the undergraduate curricula of psychology and neuroscience departments worldwide. Until this year, a single textbook, *Cognitive Neuroscience: The Biology of the Mind, 2nd Edition*, written by Mike Gazzaniga, Rich Ivry and Ron Mangun, was available to instructors. Although widely used as a textbook for undergraduate level courses, its last edition was published in 2002 and some of the information, not surprisingly, is out of date, and emerging disciplines such as social neuroscience and decision-making are not represented. Indeed, the rapidly evolving field of cognitive neuroscience has enjoyed an explosion of research in the last few years. Here we review two newly published first edition textbooks targeting the undergraduate cognitive neuroscience market. *Principles of Cognitive Neuroscience* was written by researchers from Duke University's Center for Cognitive Neuroscience and *Cognition, Brain and Consciousness* was edited by Bernard Baars and Nicole Gage.

Both textbooks cover aspects of cognition from perception, attention and memory through executive function and consciousness. *Principles of Cognitive Neuroscience* casts a wide, comprehensive net, covering the fundamental topics with a traditional systems-level neuroscience approach. Those familiar with the Gazzaniga, Ivry and Mangun textbook will see obvious similarities and may consider it an updated and expanded version of that textbook. In general, the chapters are well organized, beginning with lower-level topics such as perception, motor control and attention, and building logically to higher-level topics such as memory, emotion, language and executive control. Separate well-written chapters from the perception unit are devoted to vision, audition, and somatosensory and chemosensory processing. Additionally, full chapters cover social cognition, the representation of time and number, and decision-making—topics that are timely and reflect the directions of the field. The clear strength of *Principles of Cognitive Neuroscience* is its comprehensive coverage of up-to-date research, nicely integrating findings in a scholarly manner from both humans and animals. The main weakness may lie in the book's hesitation to place the empirical findings into theoretical frameworks that may help students appreciate the bigger picture. Despite these shortcomings, the textbook could also be used for graduate-level classes.

In contrast, *Cognition, Brain and Consciousness* places a greater emphasis on integrating across the traditional subject boundaries, with an eye toward making theoretical links across topics. Conscious experience, a specialty of Baars, provides a critical link across chapters. For example, instead of a separate chapter on consciousness as in *Principles of Cognitive Neuroscience*, the authors return to the theme of consciousness in each topic. In this instance, the authors argue that one's awareness of visual and auditory information is an important determinant of consciousness. External or internal information to which we selectively attend contributes to our conscious experience. Moreover, short-term or working memory representations of information just experienced or retrieved from long-term memory determine our conscious experiences. The authors effectively use conscious experiences as a tool to connect the various chapters on perception, attention, memory and executive control. Overall, the organization of the book is driven by psychological principles instead of by the organization of the brain's functions, which one may find refreshing. Moreover, the authors provide summaries that place existing data into theoretical frameworks and even offer some hypotheses to be tested by future research. Although these theories sometimes go beyond the data and sometimes lack the detail to provide insight into mechanisms, they are thought provoking and will surely inspire students. As a shortcoming, some of the chapters in this first edition textbook are at times uneven in content because too little evidence is offered or the evidence is unbalanced. Compared with *Principles of Cognitive Neuroscience*, *Cognition, Brain and Consciousness* places less emphasis on animal research and relies to a greater extent on human neuroimaging and neuropsychology.

Another positive note for both textbooks is that they are both filled with attractive pictures, diagrams and data figures that students will no doubt find useful in learning the material. Each provides online and digital resources that aid students and instructors with notes, slides, videos and exercises. Overall, both textbooks are excellent and will be welcome additions to the cognitive neuroscience classroom, as both appear to have succeeded in their projected aims. Instructors searching for a textbook geared along a systems neuroscience framework may prefer *Principles of Cognitive Neuroscience*. Instructors searching for a more psychological and theoretical treatment of the very same topics may prefer *Cognition, Brain and Consciousness*. Nonetheless, the true challenge for both of these textbooks will come later this year when the new third edition of *Cognitive Neuroscience: The Biology of the Mind* will be published. Stay tuned…. ■

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Erratum: Cognitive neuroscience: new kids on the block?

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In the version of this article initially published, the authors Michael L. Platt and Marty Woldorff were not listed as authors of the book *Principles of Cognitive Neuroscience*. The error has been corrected in the PDF version of the article.