An Expansive Survey, in Clear and Vivid Form: Proctor and Vu's (2023) "Attention"

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Attention is a fundamental area of study within cognitive psychology and its various applied subfields. Disappointingly, though, there have been few general-purpose introductory textbooks on attention, and none very recent for some time.

All of that makes Proctor and Vu's (2023) *Attention: Selection and Control in Human Information Processing* welcome and significant. A revised and updated version of Johnson and Proctor's (2004) *Attention: Theory and Practice*, the new volume is a magnificent piece of work. Expansive and deep at the same time, it covers the study of attention from early days and the ground up. Proctor and Vu are prolific researchers with expertise in basic attention science and human factors, and they manage here to integrate theory, behavioral research, neuroscience, and application skillfully, lacing it all with philosophy and history. The result is an introduction to attention that is suitable for advanced undergrads and grad students, and a reference work that even experienced researchers will find useful.

Chapter 1 is a history of attention research, beginning in Renaissance and Enlightenment philosophy, proceeding through the pre-Behaviorist and Behaviorist eras of psychological science, continuing through the "information processing" revolution (as Proctor and Vu term it), and ending with 21st-Century neuroscience. The whole narrative is engaging, but what stands out is a review of attention research from first-generation

psychologists and their proto-psychologist forebears. Proctor and Vu have gone to primary sources, and they relay the work of Donders, Wundt, Külpe, and others in instructive detail. The sketch that they give us contradicts the myth of early psychology as all shaky introspection, and shows us how well early psychologists anticipated the themes of modern attention research.

Chapter 2 is an overview of analyses and measures common in attention research: reaction times, signal detection, diffusion modeling, electrophysiology, and more. The presentation makes challenging topics approachable and provides methodological backstory that will prepare readers well for upcoming chapters. Later chapters cover empirical and theoretical work on attention, beginning with more basic topics, transitioning to applied matters, and ending on individual differences and social attentional processes. Appealing pedagogical features throughout the book include side boxes on issues likely to be of special interest to students, and Key Point lists that sum up each chapter.

The book obviously covers the canon of attention science, including the psychological refractory period, the Stroop and Simon effects, the vigilance decrement, auditory shadowing, early and late selection theories, resource theories, the P2/N2/P3 ERP components, inattentional and change blindness, and the attentional blink. It augments that with discussion of cutting-edge findings and theories, including neuroscientific results and computational models, and with coverage of topics in engineering psychology (e.g., display design, situation awareness and workload measurement) and clinical psychology (e.g., ADHD, autism). It describes experiments, giving readers insight on the mechanics of attention research. It also critiques research paradigms where necessary. Telling examples come in the chapter on social attention, where the authors efficiently dismiss a large but hollow literature on social priming, and where they thoughtfully discuss the inadequacy of conventional lab-based attention tasks for studying social processes.

We could quibble about some gaps in coverage—for instance, we were surprised to see no discussion of Sweller's (1994) cognitive load theory, an influential application

of attention research to the design of instructional materials—but given the aims of the book and the scope of what's already included, that would seem ungrateful.

If there is any small thing to be frustrated by, it's that coverage is sometimes *too* comprehensive and even-handed. In spots, discussion is given to experiments and theoretical disputes that are interesting but not quite vital. A rundown of back-and-forth experiments on the question of whether the scale of visual attention affects spatial and temporal resolution differently might strike readers from outside that narrow area of study as an unnecessary digression. An unresolved comparison of one researcher's two-component model of working memory as embedded LTM activation to another's three-component model could likewise leave readers wondering what makes the difference important and what larger point they are meant to take away. An approach that was occasionally more selective, culling some minor findings and debates and focusing more assertively on bigger-picture conclusions, could have reduced readers' cognitive load and left non-experts with a firmer sense of what they need to know.

Our own recent text (Wickens et al., 2023) attempted a more heuristic and application-focused review of the attention literature. In it, we tried to sidestep theoretical topics without direct relevance to practitioners and to extract guidelines for managing attention in aviation, air traffic control, driving, health care, education, and other real-world settings. Basic scientists and students new to attention will find fuller all-around coverage of the topic in Proctor and Vu's volume, whereas we hope that readers in applied fields will find more specialized practical guidance in ours. Altogether, we expect the two books will complement one another well.

Proctor and Vu's work, in any case, is a terrifically valuable contribution. It will serve well as the text for undergrad or grad seminars on attention, or potentially for more general courses on low- to mid-level cognition and human performance, and we expect that even advanced students and experienced researchers will consult it often.

References

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