perception of the quality of sounds, auditory masking, and the perceptions of melody. Chapters 7 and 8 provide guidance on Baroque composition and part-writing, Chapters 9 and 10 explore embellishments and the sense of music leading somewhere, and Chapters 11 through 14 present additional considerations for composition, such as the perception of harmony and how we analyze auditory scenes and experience musical texture. Chapter 15 discusses how learning and experience influence sound perception, and Chapter 16 focuses on experiments on why music is pleasing. Chapter 17 comprehensively summarizes the book.

For readers who tire of marching through each principle, Huron has incorporated an explicit roadmap for reading *Voice Leading* in Chapters 1 and 17. He also implements parallel formatting for ease of reading: each chapter starts with a concise plan, a tangible and common example to illustrate the ideas discussed, technical exploration of the concept with key ideas italicized, extensive background to explore the ideas, and an excellent summary in a chapter reprise. Although each chapter is dense with scientific information, and the information can be quite technical at times, the explanations are easy to grasp. At the end of each chapter it will be a pleasant surprise to discover how much you have learned.

You do not have to be a musician or composer interested in the cognition of music to appreciate this book. For bioacousticians, the author's navigation of human auditory perception invokes shadows of signal analysis, peripheral nervous system constraints, central nervous system processing, multicomponent signals, and signal composition that can be applied across the animal kingdom. Huron's neuroethological approach to understanding the perception of music will bring new appreciation to consideration of the aesthetics of sound in other animals. Furthermore, the historical commentary on musical composition throughout anchors the volume within a social context. Perhaps for Huron's next book he could consider how auditory perception in other animals contrasts with humans to provide context for how unique—or not—human perception of music really is.

Overall, *Voice Leading* provides a framework not just for understanding why musical compositions are perceived the way they are (or which rules musicians should follow to meet specific goals), but paints a picture of the complexity of the neurophysiological and psychological aspects of the impressive human auditory system.

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The Rationality Quotient: Toward a Test of Rational Thinking.

By Keith E. Stanovich, Richard F. West, and Maggie E. Toplak. Cambridge (Massachusetts): MIT Press. $39.00. xvii + 459 p.; ill.; author and subject indexes. ISBN: 978-0-262-03484-5. 2016.

The great Arthur Conan Doyle, author of the timeless Sherlock Holmes novels, was fooled into believing that fairies exist by two teenage girls armed with a camera and a few cardboard cutouts of fairies. How could the brilliant intellectual father of the hypercritical and discerning Sherlock Holmes take on such an extravagant conviction on such meager evidence? The reason, Stanovich et al. would tell us, is that—contrary to common belief—rationality has very little to do with intelligence. RQ (Rationality Quotient) is only weakly correlated with IQ. So what underlies rational thinking? This important question is at the core of *The Rationality Quotient.*

In addition to providing a comprehensive overview of the major findings of four decades of research in the heuristics and biases tradition instigated by the great Kahneman and Tversky, this volume delivers a standardized test to assess rationality in individuals. The importance of the book lies both in the comprehensive overview of the research on (ir)rationality and the psychometric system it proposes to gauge rationality in individuals.

For far too long, IQ has been getting all of the attention. Although IQ is an important metric and a good predictor of an individual's occupational level and performance, RQ—as the authors point out—is both more encompassing and important. In an increasingly hostile cognitive environment (i.e., an environment that differs from the environment of evolutionary adaptedness to which our innate intuitive modes of reasoning are attuned) forming rational beliefs and taking rational decisions becomes ever more challenging. At the same time, in a world where we are constantly bombarded with informational snippets that diverge widely with respect to their trustworthiness, rationality becomes ever more important. The modern world, as the authors point out, puts a premium on rational thinking.

But the importance of rational thinking on an individual level is overshadowed by its importance on a societal level. From overconfidence leading to war and financial crises to the affect heuristic making us overreact on terrorism and remain dangerously impassive to the threat of climate change, the woes of society are the result of a lack of rationality. One can only hope that putting RQ on the map will produce a Flynn effect as has been the case for IQ, where average IQ has been steadily on the rise since the test was first introduced in the beginning of the 20th century.

And, contrary to IQ, I believe RQ is highly trainable. This important point is somewhat underemphasized by the authors. The fact that rational thinking can be trained is obviously the case when it requires the proper mind ware (such as Bayesian statistics to override our deficient intuitions on the matter). But, to a certain extent, the habit to engage type 2 reasoning processes to check and if necessary override the outcome of type 1 miserly processing can also be trained. This of course is an empirical matter and should be further explored. Thanks to the standardized Comprehensive Assessment of Rational Thinking (CART) test that is now possible.

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THE WILEY HANDBOOK OF EVOLUTIONARY NEUROSCIENCE.

Edited by Stephen V. Shepherd. Hoboken (New Jersey): Wiley Blackwell. $195.00. xiii + 542 p. + 37 pl.; ill.; index. ISBN: 9781119994695 (hc); 9781118316573 (eb). 2017.

The focus of this handbook is to understand the commonalities and complexes of vertebrate as well as invertebrate brains. These commonalities and complexes are explored in 19 essays, organized into five sections: introduction and methods (Chapters 1–2); biological computation and brain origins (Chapters 4 through 7); brain structure and development (Chapters 8 to 12); evolution and experience (Chapters 13 and 14); and interacting brains, interacting minds (Chapters 15 through 19).

The first section includes meta-level issues, such as why brains evolved at all, the evolution of evolutionary neuroscience itself, and the data as well as methodological resources for reconstructing brain evolution (e.g., the fossil record, endocasts, molecular data, comparative neuroanatomy, and neural developmental patterns, among others). An alternative research issue is the adaptive responses that evolved due to selective pressures and environmental inputs. Another issue is the *scala naturae* presumption in contemporary comparative neuroanatomy (i.e., that brain evolution, structure, and size proceeded linearly, hierarchically, and progressively). On the contrary, rather than uncritically assume that the telos or goal of evolution is the human brain, the focus of this volume is on the diversity of vertebrate and invertebrate brains, with our brain simply one Bauplan among countless others.

The next section addresses such issues as: the molecular mechanisms for computation predating the appearance of neurons, the integrative functions and centralization of neural networks, and dorsoventral and anteroposterior neural organization, which supports monophyletic brain origins. Additional issues include the first nervous systems, whether there are fundamental molecular mechanisms that impose computational constraints on all brains, and whether there are shared patterning mechanisms for complex brain circuitry.

The third section focuses on the developmental and computational features of synapses and neural networks. For the editor, this section (containing one-third of the essays in this handbook) was the most challenging. Topics here include the organization of early invertebrate nervous systems, the respective organizing neural Bauplan of mammals and birds, the evolution of neurotransmitters and their role in the developing brain in vertebrate as well as invertebrate brains (e.g., developmental programs in the vertebrae frontal lobe), early craniates and vertebrates, obsolete models of forebrain development in craniates, and the appropriate levels of analysis and perspective for understanding neural development in invertebrates.

The following section examines the widespread effects of environmental pressures and constraints on neural developmental change, the cognitive effects of such changes, the association between diverse architectural morphologies and computational architectures, current issues regarding micro- and macro-level brain allometry, and neural processing integration and structural network connectivity. The fifth section addresses the more behavioral- and social-interactive dimensions of brains, including interpreting and responding to behavioral signals within and between species, the adaptationist (or mosaic evolution) model versus the developmental constraints model, whether cortical expansion or sociological factors best model cognitive and complex behavior, the evolution of communicative signals, perception of identity and status, and the theory of mind debate.

Accompanying the numerous illustrations in the written text are an additional 36 separate pages of visual material. These include over 50 circuit-wiring schematics (many in color), more than 100 line drawings and color photographs, microcircuitry photographs, schematic cross-sections, and cladograms of craniate taxa with representative brains, among others.

A number of the essays in this volume regarding the evolution of nervous systems and adaptive, learned responses can be read from two different contemporary and competing models. One is that such responses (e.g., associative learning, forward planning, reciprocal signal exchange) are *computational* functions of strongly conserved developmental mechanisms across species. On an alternative reading, modeling such responses requires reference to outside-the-organism, ecological contexts. In the case of vertebrates, these respectively translate into a fo-