Book Review

Robert A. Wilson and Frank C. Keil, eds., *The MIT Encyclopedia of the Cognitive Sciences*, Cambridge, MA: MIT Press, 1999, cxxxii + 964 pp., $65.00 (paper), ISBN 0-26273-144-4.

The *MIT Encyclopedia of the Cognitive Sciences* (*MITECS* for short) came out in hardcover and CDROM in 1999 and is now available in paperback format at a reasonable $65. It can also be accessed over the Web at the URL `http://cognet.mit.edu/MITECS/Front/author_index.html`, which permits a very handy keyword search for terms of particular interest. It is impossible to review the entire volume in all its forms in the space of a book review, so I will stick to the paperback version and simply urge interested readers to take a look at both paper and electronic versions.

The encyclopedia begins with six short essays followed by 471 brief and concise articles concerning topics of current interest to cognitive scientists and their critics. Also provided is a simple list of entries (at the start) and name and subject indices at the back of the book. The volume has a uniform and easily readable layout that lends itself well to both detailed reading and quick perusal. Keywords within each article, for instance, are put in small caps and point the reader to related articles within the volume. Articles are written by recognizable experts in their fields (at least as far as I am competent to judge) and end with lists of references and further readings varying somewhat in length. A few authors cite their Ph.D. dissertations, but most of the references appear to be to items that would be readily available to anyone with access to a decent university library. These features suit the volume to readers who are not, perhaps, already conversant in the topic of each article but would like to know what it is about, how it is related to his or her own areas of expertise, and where to find out more about it.

The meat of the book is in its entries, but it is worthwhile to comment on the opening essays before proceeding to the entries themselves. The general intention of the essays is to position the topics covered in the encyclopedia in their historical and disciplinary contexts. Robert Wilson, for example, does a comprehensive job of relating issues in cognitive science to traditional issues in philosophy, especially the philosophy of mind. This essay is surprisingly clear and well presented for the amount of territory that it covers. It is a shame that it will probably not be widely read since the potential audience for such an overview will likely not think of the encyclopedia as a place to find this sort of information. I think that Keith Holyoak's overview of psychology is more appropriately aimed at its likely audience. It is much briefer, and more topically rather than historically oriented.

In the final analysis, though, the essays do not appear to contribute much to the volume. A more appropriate contribution, and one more likely to attract readers, would be a single overview of the health and direction of cognitive science, perhaps organized as a target article by one author with following commentary by others. Such articles often shed more heat than light, but they can be good reading and more of a stimulus to further thought and discussion.

Obviously, no one can hope to review 471 articles. So, I will restrict this review to a handful of articles on topics about which I have some interest, knowledge, or both. The first topic I looked up in the index was "irony", but it is not mentioned there. Verbal irony, however, is discussed in the entry on FIGURATIVE LANGUAGE written by Ray Gibbs. Gibbs' entry is clearly expressed and quite comprehensive for its length, covering phenomena such as metaphor and indirect requests, as well as verbal irony. Furthermore, Gibbs provides short but appropriate examples of each item discussed such as indirect questions (e.g. "Can you pass the salt?" rather than "Pass the salt, please."). I thought Gibbs' brief critique of the Gricean model of figurative language was very good. Psychological research indicates that the Gricean model does not describe people's actual processing of figurative language, a point that has not penetrated the "traditional" understanding of cognitive science (especially in philosophy, in my experience). It is curious that the entry on figurative language is not referenced in the entries on GRICE, IMPLICATURE, or RELEVANCE THEORY where such a link would be highly relevant. In any case, it is a pity that the subject of irony does not get an entry of its own, as there are other sorts of irony (e.g. situational and dramatic) for which good research exists and that deserve mention. I hereby offer my services to write an article on the topic for the next edition.

The entry on ANALOGY is written by Dedre Gentner, a central figure in cognitive research on this topic. The article provides a good overview of the functions of analogy (e.g. inference, decision making, creativity, learning) and the current approaches to cognitive modelling of analogical thinking. No example of an analogy is worked out in any detail, an omission that may leave the uninitiated reader in the dark as to what all the issues raised are really about. For example, the article talks about *mapping* being the process of *aligning* representational structures; but neither alignment nor representational structure are illustrated or explained. The references will provide the answer, but a paragraph or two with an illustration would have been worthwhile and would avoid frustration. Otherwise, the article provides a good outline of study for digging into current analogy research. Also, I would say that the entry provides a decent outline for two or three lectures on the topic of current analogy research for an introductory cognitive science course.

The entry on AUTISM is written by Uta Frith, who is, to my understanding, a leading researcher in this field. I have read a handful of papers on the subject, along with popular books written by autistics themselves (namely Grandin, 1986; Williams, 1992). I was disappointed not to see these last books in the references. Of course, they are not part of the scholarly literature as such, but would give the

non-expert a well-rounded perspective on the subject. In any case, Frith's article is admirably concise and clearly stated, discussing both the behavioral characteristics of autism and the theories posited to explain it. As with the analogy entry, this entry provides not only a nice summary, but the outline of a lecture or discussion session on the topic if suitably followed through the references.

The unenviable task of summarizing GÖDEL'S THEOREMS in two pages is undertaken by Wilfried Seig. The job is done in a direct and, I think, finally un-helpful way through a historical approach – putting the theorems in the context of Russell's type theory and Hilbert's research program, and relating them to the Church–Turing thesis. My guess is that a reader of the MITECS will be looking for a primer on current arguments about what, if anything, Gödel's theorems tell us about the mind construed as a computer program. Penrose, among others, famously holds that the theorems demonstrate an inherent defect in this approach to the mind. Sieg offers no commentary on the subject other than to state that Penrose is incorrect (p. 352). Neither do the references or further readings direct the reader to the voluminous commentary on this subject (e.g. the commentary on Penrose 1990). Whatever its merits, this entry probably will not help the average reader of the MITECS.

The MITECS contains essays on several figures who have influenced or contrib-uted to cognitive science. The entry on KANT is provided by Andrew Brook. Kant has indeed exerted a great influence on cognitive science, not directly but through his influence on the philosophers and psychologists of the 19th century, who then set the stage for the 20th. Brook does not attempt to trace this influence, which is perhaps a wise decision under the constraints of space for the article. The effect, though, is a rather Whiggish account of Kant: where Kant's ideas resemble modern cognitive theories, Kant is given credit as their originator. I suspect someone could write an equally cogent article on the Kantian ideas that had to be shed before cognitive science could arise. (Richard Gregory writes that HELMHOLTZ made progress in psychology partly by rejecting the "prevailing Kantian philosophy," p. 368.) Some of Kant's contributions are undeniable, e.g. the idea of a concept. Some contributions are tenuous, e.g. that the inferences cognitive scientists make about mental representations owe anything to Kant's method of transcendental argument. The historical connection between Kant and modern cognitive science might be partly filled in by forward references to entries on later figures who de-veloped, modified, or rejected Kant's ideas, such as Helmholtz or Wundt (Brook does refer to Freud). Of course, the introductory essays are intended to provide sketches of the history of each area of cognitive science, but the essays do not provide the same sort of focus as a series of historically-oriented entries would. In future editions, it might be better to move some of the historical material from the introductory essays to entries in the body of the encyclopedia.

I enjoyed reading Alison Gopnik's entry on THEORY OF MIND, which does a good job of summarizing the current state of research and comments candidly on where the unknowns still lie. As Gopnik admits, "As always in developmental

psychology we have a better sense of when various developments take place than of the mechanisms that underlie these changes" (p. 829). I had not noticed before reading this sentence, but it strikes me that many entries in the encyclopedia say much about what has been learned on the topic at hand but not much about what is not understood or what remains to be done. The MITECS could perhaps be more useful for research purposes if the contributors were urged to describe what questions remain open and unanswered in their respective areas.

The preface states that the goals of the volume are to provide a kind of map of cognitive science as it now stands, to summarize the current state-of-the-art in the field, and to demonstrate the value of cognitive science to questions about the mind. Having read through roughly half of the entries since receiving my copy, I would say it succeeds very nicely at capturing and covering what is happening in the field, at least insofar as I am aware of it. It does not succeed in demonstrating the value of cognitive science; rather it presupposes that value, as it should. A better way to meet this goal, if it is felt to be desirable, would be to provide an introductory target essay on that topic, as I have suggested above. In addition to these stated aims, the entries in the MITECS do well at providing ideas for introductory lectures on cognitive science topics. On the whole, I think that the paperback MITECS is well worth the $65 investment for anyone who is serious about teaching and doing cognitive science.

References

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