

**Human Cognition: A Multidisciplinary Perspective.** Indramani Singh and Raja Parasuraman (eds). SAGE Publications (India) Pvt. Ltd., New Delhi. 372 pp. Price: Rs. 425.

This book, published in 1998, is based on (updated versions of) selected contributions to the First International Symposium on Cognition held at Banaras Hindu University, Varanasi, 14–18 December 1993. One feels a little odd reviewing this book now, since the second International Symposium on Cognition and Education was held at the same venue in 1995, and a short account of this Symposium, together with four papers presented at this Symposium, have already appeared in a special issue of *Vivek* (January 1996 *Vivek*, 9) guest-edited by the editors of the book under review.

Going back to the first Symposium, the editors state that 'the objective of the Symposium was to discuss the latest research findings in Cognitive Science from multidisciplinary perspectives and in the special context of the scientific and technical needs and aspirations of a developing country like India. In all 15 papers were selected for this volume' (p. 18). It is unclear what specific criteria were used to select these 15 contributions. Most of them (including the keynote address) discuss a narrow set of experimental results and do not seem to be particularly concerned with the relevance of what they discuss to the 'technical needs and aspirations' of India or any other developing country. In view of the above observations, I shall not attempt to be comprehensive in my review, dealing with each paper at length.

The editors, together with Gerald Matthews, in their introduction, entitled 'Diversity in Cognitive Science', attempt to provide a rapid survey of the cognitive science field in 20 pages. Opting for comprehensiveness of coverage (e.g. philosophy; cognitive neuroscience; symbolic vs subsymbolic computation; language, logic, and representation), the survey inevitably lacks depth. It will make sense only to those already familiar with the field.

The authors state: 'cross-cultural studies are becoming increasingly influential in the domain of cognitive psychology. Culture has a significant impact on

cognition which, in turn, shapes the behaviour of an individual'. (p. 23). The authors identify 'the problem of [mental] representation of information' as one of the most difficult issues in cognitive science. (p. 29).

Posner's keynote address (updated for this volume) is entitled 'Current Research in Cognitive Neuroscience'. Despite the comprehensive coverage implied by the title, Posner restricts himself to applications of brain-imaging techniques (such as PET) and the use of scalp electrodes to record fast-changing event-related potentials (ERPs). He considers the use of these techniques, either alone or in combination, to studying 'reading' as a cognitive skill, and 'address issues of localization, circuitry, attentional modulation, and plasticity'. (p. 41).

Based on studies using PET, we find that 'there is an exquisite localization of the component mental operations involved in cognitive tasks'. (p. 42). 'The set of anatomical areas [involved in a cognitive task] together with their time courses constitute the circuitry of that cognitive task'. (p. 44).

Summarizing the current state of the art in cognitive neurosciences, Posner notes that 'it is possible to analyse a number of cognitive tasks in terms of their underlying anatomy and circuitry'. He expects: 'the new ability to image thought processes will continue to support a strong degree of integration between cognitive science and neuroscience, and will advance our understanding both of the brain and of cognitive functions'. (p. 52)

All the studies considered by Posner in his paper are concerned with the use of alphabetic scripts (only Latin script?) to form genuine words and, also, meaningless strings. It should be of basic interest to study contrastively the use, in similar contexts, of other kinds of scripts (e.g. ideographic like Chinese, or quasi-alphabetic like those used in India). Will the anatomical areas and circuitry continue to remain the same? Also, it is unclear (at least to an outsider) to what extent identifying the set of anatomical areas together with their time courses would enable one to actually infer *at the logical level* computational networks (or, equivalently, simulatable computer programs) that underpin the observed behaviour.

The remaining 3 papers in section I (entitled 'Cognitive Neuroscience') are concerned with mechanisms underpinning 'attention'. Section II (entitled 'Attention, memory, language, and emotion') starts with one more paper on attention, specifically its breakdown in illnesses such as Alzheimer's disease. The next paper – also on attention – deals with aging and selective attention with emphasis on normal aging.

Section II includes 4 more papers which deal with a variety of unconnected problems – e.g. comparison of performance decrement over time of older subjects and younger ones; a contrasting study of episodic and semantic memories; factors contributing to language differentiation; and, finally, the administration of training programmes to enhance the performance of mentally-retarded children to recognize and reproduce emotion-related facial expressions.

Section III contains 5 papers, again quite unrelated, grouped under the general title 'Applications of cognitive models'. The first considers cockpit automation and its effect on pilots. The next paper examines some problems associated with human-computer interface. The third paper discusses novice-expert differences in reasoning in medical diagnosis. The last two papers consider the role of mental models, again, in specific medical contexts. The second of these, perhaps, is the only one that directly addresses the central objective of the Symposium. According to the study described here, mothers in rural India use mental models (i.e. knowledge structures) based on traditional practices. Their conceptualizations are little affected by exposure to modern bio-medical theories.

To sum up, despite the belated appearance of this book, its value to India might have been greater if a summary, in some form, of the current state of neurosciences study in India had been included. Even a plain listing of the technical programme of the Symposium in an Appendix would have served this purpose.

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