Computation and Cognition: Toward a Foundation for Cognitive Science

By Zenon W. Pylyshyn

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The question, "What is Cognitive Science?" is often asked but seldom answered to anyone's satisfaction. Until now, most of the answers have come from the new breed of philosophers of mind. This book, however, is written by a distinguished psychologist and computer scientist who is well-known for his work on the conceptual foundations of cognitive science, and especially for his research on mental imagery, representation, and perception.

In Computation and Cognition, Pylyshyn argues that computation must not be viewed as just a convenient metaphor for mental activity, but as a literal empirical hypothesis. Such a view must face a number of serious challenges. For example, it must address the question of "strong equivalents" of processes, and must empirically distinguish between phenomena which reveal what knowledge the organism has, phenomena which reveal properties of the biologically determined "functional architecture" of the mind. The principles and ideas Pylyshyn develops are applied to a number of contentious areas of cognitive science, including theories of vision and mental imagery. In illuminating such timely theoretical problems, he draws on insights from psychology, theoretical computer science, artificial intelligence, and psychology of mind.

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Editorial Review

Review

I think Pylyshyn has a great deal of important understanding of the role of the architecture in defining the nature of symbolic behavior, more so than almost all of the cognitive-science oriented philosophers and more than most cognitive psychologists.... His development of the notion of cognitive penetrability as an essential criterion is extremely useful in making some of this understanding clear.... He really does bring to this problem a depth of insight that most others do not have.

(Allen Newell, University Professor of Computer Science, Carnegie Mellon University)

Required reading for every serious student of the field.

(*The Times Higher Education Supplement*)

Pylyshyn's book is an exceptionally penetrating and useful analysis of the logical underpinnings of cognitive science, with careful treatments of the intentional, functional, and computational strands of cognitivism and their interrelations.

(Steven Pinker, MIT)

From the Author
This book is now also available in Spanish, Japanese and Chinese (easy script). Check with publisher, MIT Press.

About the Author
Zenon W. Pylyshyn is Board of Governors Professor of Cognitive Science at Rutgers Center for Cognitive Science. He is the author of *Seeing and Visualizing: It's Not what You Think* (2003) and *Things and Places: How the mind connects with the world* (2007) both published by The MIT Press, as well as over a hundred scientific papers on perception, attention, and the computational theory of mind.

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From reader reviews:

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