THE SYSTEMATICITY ARGUMENTS

STUDIES IN BRAIN AND MIND

SERIES EDITORS:

THE SYSTEMATICITY ARGUMENTS

by

Kenneth Aizawa
Centenary College of Louisiana, U.S.A.

SPRINGER SCIENCE+BUSINESS MEDIA, LLC

Library of Congress Cataloging-in-Publication Data

Title: THE SYSTEMATICITY ARGUMENTS
Author: Kenneth Aizawa
ISBN 978-1-4020-7284-0 ISBN 978-1-4615-0275-3 (eBook)
DOI 10.1007/978-1-4615-0275-3
A C.I.P. Catalogue record for this book is available
from the Library of Congress.

Originally published by Kluwer Academic Publishers in 2003

Printed on acid-free paper

For my parents, with much love.

CONTENTS

LIST OF FIGURES

PREFACE

This book addresses a part of a problem. The problem is to determine the architecture of cognition, that is, the basic structures and mechanisms underlying cognitive processing. This is a multidimensional problem insofar as there appear to be many distinct types of mechanisms that interact in diverse ways during cognitive processing. Thus, we have memory, attention, learning, sensation, perception, and who knows what else, interacting to produce behavior. As a case in point, consider a bit of linguistic behavior. To tell a friend that I think Greg won a stunning victory, I must evidently rely on various bits of information stored in my memory, including who my friends are, who Greg is, what he won, and what natural languages I share with my friend. I must sense and perceive that my friend is within hearing distance, how loud I need to speak, how loud I am speaking, and whether my friend is paying attention. I must avail myself of what I know about the language I share with my friend, along with innumerable principles about human "folk psychology." This book does not address the full range of contemporary theorizing about cognitive architecture, but only a part. It addresses theories of cognitive architecture that hypothesize that there exist cognitive representations, then begins to explore the possible structure of these representations.

One of the leading hypotheses concerning the structure of cognitive representations is that it is akin to that found in symbolic logic. The representations are thought to be like logical representations insofar as they have a combinatorial syntax and semantics. So familiar is the idea that it is often referred to as "Classicism." Although there are many conceivable alternatives to Classicism, some are more salient than others. One possibility is that cognitive representations are purely atomic, lacking both the syntactic and semantic combinatorial apparatus found in symbolic logic. Another possibility is that cognitive representations represent in the way in which Gödel numbers represent or in the way in which vectors of real numbers represent. This book does not address the full breadth of the issues about cognitive representations, but only a part. This part has to do with a family of productivity and systematicity arguments developed most forcefully by Jerry Fodor and Zenon Pylyshyn.

The common element in Fodor and Pylyshyn's arguments is that some generalization is offered as a putative fact about the nature of cognition, a fact that a theory of cognitive architecture should explain. In the productivity of thought argument, for example, it is alleged that human cognition allows for an unbounded number of distinct thoughts. In the systematicity of inference argument, it is alleged that the capacity for performing a given type of inference is really a capacity for a multiplicity of instances of that type of inference. Also

common to these arguments is the Classicist contention that a Classical theory of cognitive representations explains these putative facts, where rival theories, such as those that maintain that cognitive representations are like vectors, do not. This book does not address all the issues that are involved in the systematicity and productivity arguments, but only a part. In particular, it addresses what might be called the "logic" of the arguments.

The systematicity and productivity arguments are ultimately empirical arguments for an empirical theory of human cognitive architecture. One might, therefore, think that we need empirical studies that show that cognition is, in fact, systematic and productive and, if so, just what sorts of systematic and productive regularities there are. Thereafter, one can focus on the extent to which rival theories of cognitive architecture are able to explain such systematic and productive regularities as empirical studies might bear out. Yet, while such studies have their place, the current situation in cognitive science appears to leave room for other work, work that one might think falls more naturally to a philosopher than to a psychologist. In reviewing the literature, one finds a wide range of vagaries, ambiguities, and confusions surrounding what is to be explained in the systematicity and productivity arguments. It is unclear to many, for example, what the productivity of thought is supposed to be and what the systematicity of inference amounts to. One also finds that the basic "logic" of the family of systematicity arguments has gone underappreciated. There has yet to be sufficient attention to Fodor and Pylyshyn's contention that the desired kind of explanation of the various systematic relations in thought requires more than that a theory should fit the data. The consequences of this lack of attention could hardly be greater. Among them is the fact that many non-Classical attempts to explain the systematic relations in thought are quite wide of the mark. More surprisingly, one finds that even Classicism cannot meet the most familiar explanatory challenges posed by the systematicity arguments.

So, the aim of the book is to clarify the premises and the reasoning involved in the productivity and systematicity arguments. The aim, therefore, is well-suited to the exercise of certain basic philosophical skills, such as making distinctions, close reading of texts, and an examination of arguments. It may be tempting, therefore, to object to this work by observing that the nature of cognitive architecture is an empirical matter to be settled by experiment, rather than armchair speculation. This temptation must, of course, be resisted. This book is not meant to resolve all the issues in the debates over cognitive architecture. Instead it is only supposed to be one component of the long-term empirical project of determining the architecture of cognition. The generation of new experimental results is a paradigmatic and crucial scientific activity, but it is not the only paradigmatic and crucial scientific activity. Just as important is the interpretation of the way in which particular experimental and

observational results bear on theory. Once the data are in, one must still figure out what theoretical implications they have. Yet another paradigmatic scientific activity is the attempt to clarify scientific issues as an aid to the design of future experiments. Scientists across the disciplines must regularly try to imagine just what sorts of experiment they might design in order to evaluate a theory. The measure of success of the present philosophical exercise will be the extent to which it invites a reconsideration of some of the positions found in cognitive science, stimulates the clarification and resolution of some outstanding problems, and guides the application of relevant experimental results.

ACKNOWLEDGMENTS

For a long time I have seen my life as just my academic life. Thus, I appreciate the various book and journal editors who have accepted my work for publication. I have also enjoyed and benefited from philosophical interactions with people who have read my papers, commented on my papers, and listened to my conference presentations. These people include Fred Adams, Istvan Berkeley, John Bickle, Kevin Falvey, Gary Fuller, Bob Hadley, Jerry Fodor, Jay Garfield, Pim Haselager, Chris Hill, Cory Juhl, Brian McLaughlin, Bob Stecker, Victor Velarde, and Fritz Warfield. I owe a special debt to the Philosophy Department at the University of Maryland, College Park, for a postdoctoral fellowship that gave me time to think about the systematicity of thought, and many other things. Michael Devitt, Michael Morreau, Paul Pietroski, and Georges Rey helped me considerably by pressing for all manner of clarifications and elaborations at an early stage of the present work. Their demands have given me dozens of pages of work. Jay Garfield read and commented on a penultimate draft of the manuscript. Pim Haselager commented on several chapters, especially those with which he disagreed. Brian McLaughlin, both early and late, offered comments and suggestions that changed the character of the work in ways I think he cannot know, perhaps in ways of which he would not approve.

Yet, for a person who has seen his life as his curriculum vita, I do have personal debts I have to acknowledge. There are, of course, my parents, who have always been behind me, supporting whatever I do. I certainly could not have gotten this far without them. For over 20 years, Chris Hill has been reading my papers, encouraging their improvement. Fred Adams, Gary Fuller, Nolan Kaiser, and Bob Stecker were an outstanding group of colleagues in my first years as a professor. I may never have such fine colleagues again. Fred deserves a double thanks for supporting me. Were it not for his intellectual support and being a good bud, I might well have done something like become a physician so I could make a lot more money, live in a much bigger house in a much bigger city. Thanks, . . . I think. Then, there is my brother, Scott "Go for the money!" Aizawa. He's made my drive to work longer, but a helluva lot more fun.

Finally, there is Angie, who has made my life so much more than my curriculum vita. I love her immeasurably.