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# The organization of language

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# THE ORGANIZATION OF LANGUAGE

To the memory of Henry David Block, our friend and colleague and teacher. He taught us many things that helped us write this book, but more important, he taught us a way of thinking about scientific problems.

# Foreword

It is a privilege for me to introduce readers to what I look upon as a gem of scientific theory construction in the field of language, a new and refreshing theory of syntax and syntax acquisition that should command the attention of all those concerned with language and its learning. Moulton and Robinson provide a new and satisfying orientation to many of the issues that have occupied linguists and psycholinguists since the advent of the Chomskyan revolution more than two decades ago. It draws upon the best features of modern behavioral and cognitive approaches.

There are at least three respects in which the Moulton-Robinson theory is distinctive.

First, it emphasizes the language learner's or user's powers of conceptualization as a basis for the organization of language structure, and stresses the role of the nonlinguistic environment in helping language learners to acquire that structure as it is realized in a particular language. These matters have been too long neglected in standard linguistic and psycholinguistic theories.

Second, it is explicit about what kinds of grammatical objects or entities are involved in language use and acquisition. These grammatical objects are structures embodied in the authors' highly original "orrery" and "syntax crystal" models, based on their notions of "scope" and "dependency." The authors specify how these structures are manifested in particular constructions and arrangements in the English language – their "syntax modules." Their proposal that the orrery and syntax crystal models have great generality, applicable to all human languages, is compellingly believable, although of course it remains to be sub-

jected to further investigation and testing with a variety of languages.

Third, the theory provides a credible and viable alternative to the nativist hypotheses about language acquisition that have dominated much discussion in the last few years. Moulton and Robinson show that it is unnecessary to postulate a “wired-in,” innate language acquisition device in the child, and that it is more than conceivable that children can learn the syntactical rules and conventions of their native language by noticing how the relations they perceive and recognize among things in their environment, on a “prelinguistic” basis so to speak, can be handled in the construction of the language utterances that they hear and that they try out in their own efforts to communicate.

The style is lively, creative, and readily understood. There are places where the reader will be forced to pay close attention and to study details, but the effort will be rewarding. To aid in the appreciation and full comprehension of their ideas, the authors have provided some “language games” in Appendixes B and C. I highly recommend that the reader or student take the trouble to construct the needed materials for these games: he or she will find them not only instructive but also more entertaining than any Double-Crostic.

A computational parser of English, SCRYP, by Paul J. Gruenewald, is presented in Appendix A. This should be of great interest to computational linguists, because it appears to provide a highly efficient procedure for translating language into conceptualizations – one that follows closely the authors’ postulated mechanisms for human language comprehension.

While the authors were at Duke University over several years, I was able – at some remove – to watch them develop their ideas. It is a pleasure to see these ideas become available to a wider audience. Any controversy they may spark will surely enliven the psycholinguistic scene for some time.

JOHN B. CARROLL

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# Preface

This book is an attempt to explain language structure and its relation to language cognition and acquisition. By starting at the beginning and reformulating the questions asked by current linguistic theories, we analyze the essential features of language and language users. From this base we construct a theory that avoids the complexity of many contemporary language theories and requires few presuppositions about innate language abilities. At the same time the theory is able to explain a great variety of language structures and much of the data of human language performance.

Because we start with fundamental questions about the nature of language, the book makes language science accessible to the nonspecialist. In order to provide a background for understanding our theory and its implications, we consider major contemporary theories of language in detail and evaluate related claims about language. These decisions provide a framework for evaluating our own claims. We hope that publication of this book will get other people interested in our approach and solicit help in finding theoretical and empirical consequences of the theory.

Frederik Pohl and Cyril Kornbluth, when asked of a jointly-authored work “who did what?”, are reported to have replied that one of them wrote the nouns and the other the verbs. When we are asked the same question, we answer that one of us wrote the vowels and the other the consonants. This reply represents the spirit of our collaboration on this book; even the smallest meaningful unit was a joint effort. We did everything together and together we take responsibility for it; the order in which our names appear on the book cover was determined by a lengthy Alphonse and Gaston routine.

Many friends, colleagues, and students helped us by their suggestions, criticism, and encouragement, especially, Michael Arbib, John Carroll, Herb Crovitz, Ed Matthei, Julie Meister, David McNeill, John Staddon, Lise Wallach, and Robert Weisberg. We are also grateful to Ann Jacobs and to Susan Milmoie and Sophia Prybylski of Cambridge University Press. And we thank Larry Erlbaum, Marc Boggs, and Joan Goldstein for their kindness and confidence. Our parents have graciously agreed to take responsibility for any mistakes remaining in the book.

George M. Robinson and Janice Moulton

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# 1

## Introductory perspectives

This book is an attempt to answer the following questions: What are the essential features of language that permit a sentence or string of words to convey a complex idea? and What are the essential features of language users that enable them to produce and understand meaningful strings of words and to learn how to do so? The heart of these problems is syntax, and our answers constitute a new theory of syntax and syntax acquisition.

### **The goal of a theory of syntax**

A theory of syntax must explain how someone can express a complex idea by organizing units of language into an appropriate pattern that conveys the idea, and how another person is able to identify from the language pattern, not only the concepts expressed by the individual units of language, but the relationships among the concepts that make up the idea. A theory of syntax should also explain what essential properties of language and of language users allow this method of encoding to be learned.

In trying to identify the essential features of a phenomenon, a good theory tries to represent the phenomenon as simply as possible without doing injustice to the complexity it is trying to explain. Actual syntax use (and its learning) may involve many redundant operations in order to increase speed and reliability. A theory of syntax will not be directly interested in all the properties and processes that may be involved in syntax use and acquisition, but in those that *must* be involved – the minimally essential features for syntax to work and to be learned.

## 2      *The organization of language*

A theory of syntax should apply to any language user, human or otherwise. The actual processes used by different individuals or species may not be the same. But a theory of syntax need not claim that actual language cognition must correspond exactly to the descriptions given by the theory. It need only claim that the properties and processes described by the theory are functionally equivalent to whatever ways humans or others do language, no matter how complex and difficult their way of doing it. The object is first to construct the minimal model and see how it works. If the model fails to account for an important theoretical or empirical aspect of syntax, appropriate alterations or adjustments must be made. Beginning simply, one can keep track of which features of the model are needed for particular aspects of syntax. When such a model succeeds in accounting for syntax encoding and its acquisition, it will represent the basic principles, or essence, of syntax.

What we mean by minimally essential features, or basic principles, can be explained with an analogy. Suppose we were trying to explain the principle of the internal combustion engine. It is not a fault to omit a discussion of camshafts and water pumps even though some engines use them and would fail to operate without them. It would be a fault to suppose that these components were *essentially* involved in the principle of the engine. On the other hand, it would be a fault to *not* mention that fuel and oxidant are mixed and introduced into the engine. Our explanation, if adequate, would apply to any engine regardless of whether it was two or four cycle, rotary or reciprocating piston, air or liquid cooled, fueled on alcohol or propane gas, etc. What we would have explained would be the essential features of a particular method of converting chemical potential energy to mechanical energy.

Similarly, for syntax, we do not want a theory to suppose that some nonessential properties that happen to be part of existing syntaxes are essential. It is not a fault to omit a discussion of nonessential properties. It would be a fault to include them as if they *were* essential. It would also be a fault for a theory to omit essential properties. The theory, if adequate, should apply just as well to any language and to any language user. It would be a fault to limit a theory so that it applies just to English or just to hu-