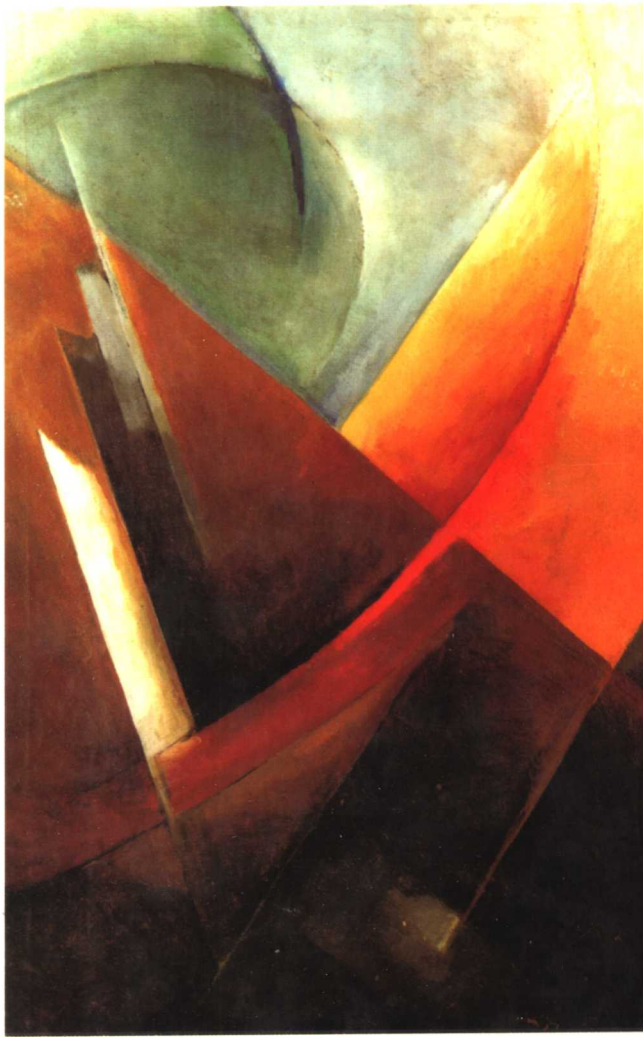


# *The Handbook of* **Linguistics**



*Edited by*

**Mark Aronoff  
and Janie Rees-Miller**



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*P u b l i s h e r s*

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First published 2001

2 4 6 8 10 9 7 5 3 1

Blackwell Publishers Inc.  
350 Main Street  
Malden, Massachusetts 02148  
USA

Blackwell Publishers Ltd  
108 Cowley Road  
Oxford OX4 1JF  
UK

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*Library of Congress Cataloging-in-Publication Data*

The handbook of linguistics / edited by Mark Aronoff and Janie Rees-Miller.

p. cm. — (Blackwell handbooks in linguistics)

Includes bibliographical references and index.

ISBN 0-631-20497-0 (alk. paper)

1. Linguistics—Handbooks, manuals, etc. I. Aronoff, Mark. II. Rees-Miller, Janie. III. Series.

P121 .H324 2000

410—dc21

99-087401

*British Library Cataloguing in Publication Data*

A CIP catalogue record for this book is available from the British Library.

Typeset in 10/12pt Palatino  
by Graphicraft Limited, Hong Kong  
Printed in Great Britain by TJ International, Padstow, Cornwall

This book is printed on acid-free paper.

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# Preface

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For over a century, linguists have been trying to explain linguistics to other people who they believe should be interested in their subject matter. After all, everyone speaks at least one language and most people have fairly strong views about their own language. The most distinguished scholars in every generation have written general books about language and linguistics targeted at educated laypeople and at scholars in adjacent disciplines, and some of these books have become classics, at least among linguists. The first great American linguist, William Dwight Whitney, published *The Life and Growth of Language: An Outline of Linguistic Science*, in 1875. In the dozen years between 1921 and 1933, the three best known English-speaking linguists in the world (Edward Sapir in 1921, Otto Jespersen in 1922, and Leonard Bloomfield in 1933) all wrote books under the title *Language*. All were very successful and continued to be reprinted for many years. In our own time, Noam Chomsky, certainly the most famous of theoretical linguists, has tried to make his ideas on language more accessible in such less technical books as *Language and Mind* (1968) and *Reflections on Language* (1975). And more recently, Steven Pinker's *The Language Instinct* (1995) stayed on the best-seller list for many months.

Despite these efforts, linguistics has not made many inroads into educated public discourse. Although linguists in the last hundred years have uncovered a great deal about human language and how it is acquired and used, the advances and discoveries are still mostly unknown outside a small group of practitioners. Many reasons have been given for this gap between academic and public thinking about language, the most commonly cited reasons being: that people have strong and sometimes erroneous views about language and have little interest in being disabused of their false beliefs; or that people are too close to language to be able to see that it has interesting and complex properties. Whatever the reason, the gap remains and is getting larger the more we learn about language.

*The Handbook of Linguistics* is a general introductory volume designed to address this gap in knowledge about language. Presupposing no prior knowledge

of linguistics, it is intended for people who would like to know what linguistics and its subdisciplines are about. The book was designed to be as nontechnical as possible, while at the same time serving as a repository for what is known about language as we enter the twenty-first century.

If *The Handbook of Linguistics* is to be regarded as authoritative, this will be in large part because of the identity of the authors of the chapters. We have recruited globally recognized leading figures to write each of the chapters. While the culture of academia is such that academic authors find it tremendously difficult to write anything for anyone other than their colleagues, our central editorial goal has been to avoid this pitfall. Our emphasis on the reader's perspective sets *The Handbook of Linguistics* apart from other similar projects.

The place of the field of linguistics in academia has been debated since its inception. When we look at universities, we may find a linguistics department in either the social sciences or the humanities. When we look at the American government agencies that fund university research, we find that the National Endowment for the Humanities, the National Science Foundation, and the National Institutes of Health all routinely award grants for research in linguistics. So where does linguistics belong? The answer is not in where linguistics is placed administratively, but rather in how linguists think. Here the answer is quite clear: linguists by and large view themselves as scientists and they view their field as a science, the scientific study of language. This has been true since the nineteenth century, when Max Mueller could entitle a book published in 1869 *The Science of Language* and the first chapter of that book "The science of language one of the physical sciences."

The fact that linguistics is today defined as the scientific study of language carries with it the implicit claim that a science of language is possible, and this alone takes many by surprise. For surely, they say, language, like all human activity, is beyond the scope of true science. Linguists believe that their field is a science because they share the goals of scientific inquiry, which is objective (or more properly intersubjectively accessible) understanding. Once we accept that general view of science as a kind of inquiry, then it should be possible to have a science of anything, so long as it is possible to achieve intersubjectively accessible understanding of that thing. There are, of course, those who deny the possibility of such scientific understanding of anything, but we will not broach that topic here.

We now know that the possibility of scientific understanding depends largely on the complexity and regularity of the object of study. Physics has been so successful because the physical world is, relatively speaking, highly regular and not terribly complex. Human sciences, by contrast, have been much less successful and much slower to produce results, largely because human behavior is so complex and not nearly so regular as is the physical or even the biological world. Language, though, contrasts with other aspects of human behavior precisely in its regularity, what has been called its rule-governed nature. It is precisely this property of language and language-related behavior that has



allowed for fairly great progress in our understanding of this delimited area of human behavior. Furthermore, the fact that language is the defining property of humans, that it is shared across all human communities and is manifested in no other species, means that by learning about language we will inevitably also learn about human nature.

Each chapter in this book is designed to describe to the general reader the state of our knowledge at the beginning of the twenty-first century of one aspect of human language. The authors of each chapter have devoted most of their adult lives to the study of this one aspect of language. Together, we believe, these chapters provide a broad yet detailed picture of what is known about language as we move into the new millennium. The chapters are each meant to be free-standing. A reader who is interested in how children acquire language, for example, should be able to turn to chapter 19 and read it profitably without having to turn first to other chapters for assistance. But the physical nature of a book entails that there be an order of presentation. We begin with general overview chapters that consider the origins of language as species-specific behavior and describe the raw material with which linguists work (languages of the world and writing systems), frame the discipline within its historical context, and look at how linguists acquire new data from previously undescribed languages (field linguistics). The book then turns to the traditional subdisciplines of linguistics. Here we have followed most linguistics books in starting from the bottom, grounding language first in the physical world of sound (phonetics) and moving up through the organization of sound in language (phonology), to the combination of sounds into words (morphology), and the combination of words into sentences (syntax). Meaning (semantics) usually comes next, on the grounds that it operates on words and sentences. These areas are traditionally said to form the core of linguistics, because they deal with the most formally structured aspects of language. Within the last few decades, however, linguists have come to realize that we cannot understand the most formally structured aspects of language without also understanding the way language is used to convey information (pragmatics) in conversation (discourse) and in literature, and the way language interacts with other aspects of society (sociolinguistics).

Fifty years ago, many of our chapters would have been absent from a book of this sort for the simple but dramatic reason that these fields of inquiry did not exist: language acquisition, multilingualism, sign language, neurolinguistics, computational linguistics, and all of the areas of applied linguistics to which we have devoted separate chapters (the one area of applied linguistics that did exist fifty years ago was language teaching).

The chapters are of a uniform length, approximately 10,000 words each, or about 25 printed pages. This length is substantial enough for a major essay, while being short enough so as not to overwhelm the reader. Applied linguistics is divided into several distinct areas that would be of interest to students and others who want to know what practical applications linguistics has. Because each of the applied linguistics chapters covers a more specialized area,

these chapters are somewhat shorter than the rest (approximately 4,000 words each, or about 10 printed pages).

We have tried not to emphasize ideology, but rather to divide things up by empirical criteria having to do with the sorts of phenomena that a given field of inquiry covers. We have thought long and hard about whether some of the major areas, especially syntax and phonology, should be broken down further, with a chapter each on distinct theoretical approaches. Our final decision was not to subdivide by theoretical approaches, based on a belief that the reader's perspective is paramount in books like this: readers of a companion do not want to know what the latest controversy is about or who disagrees with whom or who said what when. Rather, they want to have a reasonable idea of what linguistics or some subarea of linguistics can tell them. The authors have been able to do so without going into the latest controversies, though these controversies may occupy the linguists' everyday lives. The one area to which we have devoted more than one chapter is syntax, but this reflects the dominance of syntactic research in linguistics over the last half century.

We do not see this handbook as an introductory textbook, which would, for example, have questions or exercises at the end of each chapter. There are already enough introductory linguistics texts. We see it rather as an authoritative volume on what linguists know about language at the start of the twenty-first century. Each chapter covers the central questions and goals of a particular subdiscipline, what is generally accepted as known in that area, and how it relates to other areas.

When we embarked on this editorial enterprise, we expected to enjoy the interaction with many of our most distinguished colleagues that the preparation of this book would entail, which is so much easier now in the age of electronic correspondence. What we did not realize was how much we would learn from these colleagues about language and linguistics, simply from reading their work and discussing it with them. We thank all of the authors for this wonderful opportunity and we hope that the readers, too, will share in the same great pleasure.

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## ACKNOWLEDGMENT

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The illustrations used in figures 22.2, 22.3, and 22.7 are reprinted with permission from *A Basic Course in American Sign Language, Second Edition*, 1994, T.J. Publishers, Inc., Silver Spring, MD 20910, USA.

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# 1 Origins of Language

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ANDREW CARSTAIRS-MCCARTHY

## 1 Introduction

Among the inhabitants of some African forests about eight million years ago were ape-like creatures including the common ancestors of chimpanzees and humans. Visualizing what these creatures were probably like is easy enough; one conjures up an image of something resembling a modern gorilla, living substantially in trees and walking on all four limbs when on the ground, and with a vocal communication system limited to perhaps twenty or thirty calls, like a chimpanzee's. But what about our ancestors' appearance and behavior two million years ago? By that stage they were a separate species from the ancestors of chimpanzees, but were not yet *homo sapiens*. How did these creatures live, and in particular what sort of language did they have? Visualizing these more recent creatures is harder. One feels that they must have been more like us, and in particular that their vocal communication system must have been more sophisticated than that of their ancestors six million years earlier. But how much more sophisticated? Which characteristics of modern human language did this communication system now possess, and which did it still lack?

There is something eerie and yet fascinating about these intermediate ancestors. This fascination underlies innumerable science fiction stories as well as the perennial interest in rumors that such creatures may still exist, in some remote Himalayan valley perhaps. To many nonlinguists, therefore, it seems self-evident that research on the linguistic abilities of such intermediate ancestors (that is, research on the origins and evolution of human language) should be a high priority in linguistics. Yet it is not. As a research topic, language evolution is only now beginning to regain respectability, after more than a century of neglect. In the remainder of this section I will say something about the reasons for this neglect before turning in sections 2–5 to the evidence recently brought to bear by anthropologists, geneticists, primatologists and neurobiologists, many

of whom have for decades been more adventurous than linguists in this area. Then in section 6, I will discuss the kinds of contribution which some linguists also are now beginning to offer.

Many religions provide an account of the origin of language. According to the Judeo-Christian tradition, God gave to Adam in the Garden of Eden dominion over all the animals, and Adam's first exercise of this dominion consisted in naming them. The fact that there are now many languages rather than just one is explained in the story of the Tower of Babel: linguistic diversity is a punishment for human arrogance. So long as that sort of account was generally accepted, the origin of language was not a puzzle. But when secular explanations for natural phenomena began to be sought to supplement or replace religious ones, it was inevitable that a secular explanation was sought for the origin of language too.

The fact that the origin of language must predate recorded history did not inhibit eighteenth-century thinkers such as Rousseau, Condillac, and Herder, who were confident that simply by applying one's mind to the situation in which languageless humans would find themselves one could arrive at worthwhile conclusions about how language must have arisen. Unfortunately there was no consensus among these conclusions, and in the nineteenth century they came to seem increasingly feeble and speculative by contrast with the far-reaching yet convincing results attainable in historical and comparative linguistics (see chapter 5). At its foundation in 1866, therefore, the Linguistic Society of Paris chose to emphasize its seriousness as a scholarly body by including in its statutes a ban on the presentation of any papers concerning the origin of language. Most linguists still support this ban, in the sense that they believe that any inquiry into the origin of language must inevitably be so speculative as to be worthless.

Since the 1960s, the theory of grammar has come to be dominated by the ideas of Noam Chomsky, for whom the central question of linguistics is the nature of the innate biological endowment which enables humans to acquire a language so rapidly and efficiently in the first year of life (see chapter 19). From this viewpoint, it seems natural to regard the origin of language as a matter of evolutionary biology: how did this innate linguistic endowment evolve in humans, and what are its counterparts (if any) in other primates? But Chomsky has explicitly discouraged interest in language evolution, and has even suggested that language is so different from most other animal characteristics that it may be a product of physical or chemical processes rather than biological ones (1988: 167, 1991: 50). The paradoxical result is that, while Chomskyan linguists endeavor to explain characteristics of individual languages by reference to an innate linguistic endowment (or Universal Grammar), they are generally reluctant to pursue their inquiry one stage further, to the issue of how and why this innate endowment has acquired the particular characteristics that it has. To be sure, there are exceptions (e.g. Newmeyer 1991, Pinker and Bloom 1990, Pinker 1994). Nevertheless, Chomsky's influence means that linguists' reluctance to tackle this area is eroding only slowly.

In view of what has been said, it is not surprising that there is a shortage of introductory surveys of this topic from a linguistic point of view; but Aitchison (1996) can be recommended, as well as part II of W. Foley (1997). Hurford et al. (1998) is an up-to-date collection of contributions from a variety of disciplines.

## 2 Evidence from Anthropology and Archeology

Anthropology is concerned not only with human culture but also with humans as organisms in a biological sense, including their evolutionary development. (On human evolution in general, see e.g. R. Foley (1995) and Mithen (1996).) Language is both a cultural phenomenon and also the most salient distinguishing characteristic of modern *homo sapiens* as a species. The question of how and why humans acquired language therefore interests both cultural and biological anthropologists. So what light can anthropology shed on these questions?

The earliest direct evidence of language in the form of writing is no more than about 5,000 years old (see chapter 3). It is therefore much too recent to shed any light on the origin of spoken language, and we must resort to indirect evidence. Unfortunately the available evidence is doubly indirect. The vocal apparatus (tongue, lips, and larynx) of early humans would tell us much if we could examine it directly; but, being soft tissue, it does not survive, and for information about it we have to rely on what we can glean from bones, particularly skulls. Alongside such evidence we have tools and other artefacts, as well as traces of human habitation such as discarded animal bones; but, again, what is available to us is skewed by the fact that stone survives better than bone and much better than materials such as wood or hide. In view of this, the only relatively firm dates which anthropology can provide are two terminuses, one after which we can be sure that language in its fully modern form did exist and one before which we can be sure that it did not. For the long period in between, the anthropological evidence is tantalizing but frustratingly equivocal; there are no uncontroversial counterparts in the fossil record for specific stages in linguistic evolution.

We can be reasonably confident that modern-style spoken language evolved only once. This is not logically necessary. It is conceivable that something with the communicative and cognitive functions of language, and using speech as its medium, could have evolved independently more than once, just as the eye has evolved independently more than once in the animal kingdom. However, if that had happened we would expect to find evidence of it today, just as the eyes of octopuses, mammals, and insects reveal by their structure that they have no common ancestor. Yet no such evidence exists. For all their diversity, all existing languages display certain fundamental common properties of grammar, meaning, and sound, which is why Chomsky feels justified in claiming



that, to a visitor from another planet, it might seem that there really is only one human language. Moreover, a child who is removed from her parents' speech community at a young age can acquire natively any language whatever, irrespective of what her parents speak; no child is born with a biological bias in favor of one language or type of language. This means that language of a fully modern kind must have evolved before any contemporary human group became geographically separated from the rest of the human race (separated, that is, until the invention of modern means of transport). The first such clearcut separation seems to have occurred with the earliest settlement of Australia by *homo sapiens*. Archeological evidence suggests that that event took place at least 40,000 years and perhaps as long as 60,000 or more years ago. We can therefore take this as a firm *terminus ante quem* for the evolution of a form of language which is fully modern in a biological sense.

As for a *terminus post quem*, it is clear that spoken language with more or less modern articulatory and acoustic characteristics presupposes something like a modern vocal tract. But how are we to interpret "more or less" and "something like"? One thing is clear: the acoustic properties of many human speech sounds, particularly vowels, depend on the characteristically human L-shaped vocal tract, with an oral cavity at right angles to the pharynx (see chapter 7) and with the larynx relatively low in the neck. This shape is characteristically human because in nearly all other mammals, and even in human babies during the first few months of life, the larynx is high enough for the epiglottis to engage with the soft palate so as to form a self-contained airway from the nose to the lungs, smoothly curved rather than L-shaped, and quite separate from the tube which leads from the mouth to the stomach. Having these two distinct tubes enables nearly all other mammals, as well as newborn human babies, to breathe while swallowing. The adult human characteristic of a pharynx through which both air and food must pass, on the other hand, is a vital contributor to the acoustic characteristics structure of speech sounds. So when did this L-shaped vocal tract develop?

Lieberman (1984, see Lieberman and Crelin 1971) has claimed that even in Neanderthals, who did not become extinct until about 35,000 years ago, the larynx was positioned so high in the neck as to prevent the production of the full modern range of vowel sounds. He suggests that this linguistic disadvantage may have been a factor in the Neanderthals' demise. But his argument rests on an interpretation of fossil cranial anatomy which has generally been rejected by anthropologists (Trinkaus and Shipman 1993, Aiello and Dean 1990). An alternative view is that the L-shaped vocal tract is a byproduct of bipedalism, which favored a reorientation of the head in relation to the spine and hence a shortening of the base of the skull, so that the larynx had to be squeezed downward into the neck (DuBrul 1958, Aiello 1996b). The question then arises: when did our ancestors become bipedal? The general consensus among anthropologists is: very early. Evidence includes fossil footprints at Laetoli in Tanzania, about 3.5 million years ago, and the skeleton of *australopithecus afarensis* nicknamed "Lucy," dating from over 3 million years ago. So, if bipedalism was the