Biolinguistics
Exploring the Biology of Language

This book investigates the nature of human language and its importance for the study of the mind. In particular, it examines current work on the biology of language. Lyle Jenkins reviews the evidence that language is best characterized by a generative grammar of the kind introduced by Noam Chomsky in the 1950s and developed in various directions since that time. He then discusses research into the development of language which tries to capture both the underlying universality of human language, as well as the diversity found in individual languages (universal grammar). Finally, he discusses a variety of approaches to language design and the evolution of language.

An important theme is the integration of biolinguistics into the natural sciences – the 'unification problem'. Lyle also answers criticisms of the biolinguistics approach from a number of other perspectives, including evolutionary psychology, cognitive science, connectionism and ape language research, among others.

LYLE JENKINS is based at the Biolinguistics Institute, Cambridge, Massachusetts. He took his Ph.D. in linguistics at the Massachusetts Institute of Technology and has held lecturing posts at the Universities of Vienna, Salzburg, Paris VIII (Vincennes) and Hamburg. He has published a monograph, *The English Existential*, and a number of papers in various journals, including *Linguistics and Philosophy* and *Theoretical Linguistics*.

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Dedicated to My One and Only,
Lâle Berke-Jenkins

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Preface

The last forty years have witnessed what has been called the "second cognitive revolution" (see Introduction). A central focus in the study of mind (the "cognitive sciences") is the study of language and its biological bases. Work on the biology of language, or *biolinguistics*, is directed at answering some traditional questions; viz., (1) What constitutes knowledge of language?, (2) How does knowledge of language develop in the individual?, and (3) How did knowledge of language evolve in the species?

There has been an explosion of knowledge about the first two questions from studies of languages and dialects that now number in the thousands. A small sampling includes: Basque, Bulgarian, Chinese, English, Dutch, Finnish, Flemish, French, German, Greek, Hindi, Hungarian, Icelandic, Irish, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Romanian, Russian, Spanish, Swedish, Turkish, Warlpiri, and Welsh. Evidence bearing on the answers to these questions is now available from numerous areas; e.g., syntax, semantics, morphology, phonology, articulatory and acoustic phonetics, language acquisition, language change, specific language impairment, language perception, sign-language, neurology of language, language-isolated children, creole language, split-brain studies, linguistic savants, and electrical activity of the brain, among others. The past year marks the thirtieth anniversary of Eric Lenneberg's *Biological Foundations of Language*, which surveyed the work in many of these areas and therefore provides a useful benchmark for the significant progress that has been made in recent years.

Although the three central problem areas for biolinguistics listed above have been investigated in parallel, most progress has been made in the first two areas: language and development of language. Now that the necessary groundwork has been laid, the study of the third area, evolution of language, is currently intensifying and questions about language design can be formulated more precisely and addressed. These include more general questions such as why language exhibits the particular modular design that it does, why we have the particular division of labor between genetic mechanisms and environmental factors that we find and what

kind of factors played a role in the evolution of language. It also includes more specific questions such as why language has the particular computational operations that it has and how optimal these are from a design point of view.

Acknowledgements

I would like to express my great indebtedness to Noam Chomsky, first as his student and later as his colleague and friend. It was during my doctoral work at MIT in the 1960s that I first heard his exposition of what later came to be called the "argument from poverty of the stimulus," which forms the cornerstone for the argument that there is "one language (Human)," or that there is an initial state of the (cognitive component of the) language faculty, as described by the theory of universal grammar, which represents the genetic component of language. At the same time that we were learning to apply this mode of argumentation in the development of linguistic theories, we were also fortunate to hear Eric Lenneberg speak on his seminal work, *Biological Foundations of Language*, which was soon to be published. It was from this confluence of ideas from linguistics and biology that the central questions for a field of biolinguistics were born.

I would also like to acknowledge Allan Maxam's considerable influence on many of the ideas expressed in this book. He recognized the significance of the linguistic debate for biology very early on and has been as untiring an advocate from the field of biology as Chomsky has been from the field of linguistics in trying to take a few modest steps toward solving the puzzle of the "unification problem" posed for biolinguistics. I also remember with great fondness the many stimulating conversations on linguistics and a variety of other topics with my close friends and colleagues Richard Kayne, Cynthia Pyle, Ray Dougherty, Claudia Leacock, Steve Hammalian, Henk van Riemsdijk, and other colleagues of GLOW.

While teaching in the Department of Linguistics at the University of Vienna with Wolfgang Dressler and his colleagues, I also had the great fortune to meet a number of times with Konrad Lorenz and his colleagues, in particular Otto Koenig. They participated in some seminars that I had the pleasure of helping Gaberell Drachman to organize over the course of several summers in Salzburg, Austria, culminating in the LSA Summer Institute with the theme of Biology and Language. These seminars made us all aware of the similarity in the approach of linguists and

ethologists to their subject matter. As Teuber has insightfully noted: ". . . it has become clear . . . that linguists are ethologists, working with man as their species for study, and ethologists linguists, working with nonverbalizing species" (Teuber, 1967:205). I also enjoyed and learned much from numerous meetings and conversations in the Viennese coffee-houses with my good friends and linguistics colleagues Hubert Haider, Alfred Nozsicska, and the others in our Vienna Syntax Circle, with Tasso Borbé in our short-lived Austrian Society for Linguistics and Biology, and with Tom Perry, John Colarusso, Robert Wall, and Larry Hutchison.

I am grateful to the American Council of Learned Societies for the opportunity to take time off to work on language and genetics and to Allan Maxam for the invitation to spend time as a Visiting Fellow at the Department of Biological Chemistry at Harvard University and as a Research Fellow at the Department of Viral Oncology at the Sidney Farber Cancer Institute (now the Dana-Farber Cancer Institute). In the lab of David Livingston and his colleagues I was able to do some experimental work with SV40, a monkey virus, and the workhorse of molecular biology that was later to play such a crucial role in unlocking the secrets of the oncogene. I also thank Ian Stewart for his comments on the ideas of symmetry-breaking and word order (in 1994) developed in chapter 5 and Murray Eden for his comments on an earlier version of that chapter (1995). I enjoyed many stimulating discussions at the International Workshop, "The Linguistics of Biology and the Biology of Language," hosted by Julio Collado-Vides and his colleagues in 1998 at CIFN-UNAM, Mexico. Finally, I am greatly indebted to Allan Maxam and Noam Chomsky for much valuable discussion of the issues in this book.

In the fall of 1980 the Harvard Medical School Biolinguistics Group was formed under the sponsorship of Allan Maxam's Laboratory of Molecular Biology to provide an interdisciplinary forum for researchers interested in the biological foundations of language. There were many stimulating lectures and discussions, including many memorable ones with Ethan Bier, not the least of which were many animated debates at the Windsor Bar across the street from the Dana-Farber. Many, but by no means all, of the interesting topics discussed by the HMS Biolinguistics Group are reflected throughout this book.

Many thanks also to my friends in Berlin for our friendship going back to my turbulent graduate school days when I made an unplanned detour for several years inside the prisons and labor camps of East Germany – Elisabeth, Brigitte, Ingo, Antje, and with special memories of Jack Strickland, who not only achieved his dream of sailing across the Atlantic with Brigitte on the *Tumbleweed*, but also lived more of life than most people ever do. And last, but not least, many thanks for the love and

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