

Preface

THE general objective of our research is to study the biological foundations of human language. The investigations presented in this book represent a part of this effort. The research takes place at The Salk Institute for Biological Studies in a setting that includes a focus on the neurosciences: from studies of the structure of the brain to brain and behavior relations. Our laboratory seeks to understand the foundations of human language as a part of man's biological endowment. For the past seven years we have been investigating the human capacity for language through studies of a language that had not previously been systematically explored in depth: American Sign Language (ASL), a language of hand signs that has developed among deaf people in the United States.

When we began these studies we did not envisage any of the research in this book. We started out to study the way in which young deaf children acquire the visual-gestural language of their deaf parents, in order to compare language learning in a visual mode with language learning in an auditory mode. We soon found, however, that very little was known of the structure of what was being acquired by these deaf children; and so we turned our attention to the study of the adult language as well. We are still engaged in a full-scale study of the language acquisition process in young deaf children—but that will form the basis for another book. The present book deals with the questions that we asked ourselves about this hitherto largely unknown communication system and the ways in which we attempted to determine its properties. We are now beginning to see how this language in a different modality may hold remarkably deep and unexpected clues to constraints on the possible form of language. But these issues are addressed in the chapters of the book; here we want to mention some of the problems that faced us when we began our studies.

Not all of the signing that is seen by the general public (for example, the interpreting that appears in cameo inserts on television) is what we refer to in this book as American Sign Language. Many varieties of manual communication exist in the United States, ranging from English-based systems (fingerspelling and forms of signed English) to a language that is not in any sense a representation of English on the hands. The latter is the language that many deaf people use among themselves.

In order to investigate that language in its most characteristic form, we have based our analyses primarily on data supplied by native deaf signers, that is, deaf people who learned the language as a first language from deaf parents. Most of the subjects for our experiments and most of our deaf researchers have been native signers who grew up in an environment where signing was a primary means of communication. It is their language which is scrutinized in our studies and which we refer to as American Sign Language.

It was not easy for us to gain access to this language. As novices, and as hearing outsiders, we found that the way deaf people signed to us was radically different from the way they signed to each other. Not only did they slow down their signs and articulate them carefully (in deference to "foreigners"), but they arranged their signs in English word order, mouthed English words, and eliminated the most distinctive properties of their own language.

What deaf people were using with us was a sort of pidgin form of English on the hands. Sometimes when something different came into our view, one deaf person would say to another, "Don't show them that—that's slang." When they were signing among themselves, however, it appeared to us that the so-called slang was pervasive; there were all kinds of embellishments that they earnestly shielded us from. We began to collect examples of what was being sifted out, and gradually found that there were recurring patterns, some of which formed the nucleus for what we much later determined were grammatical processes in the language. In this way, our study of ASL as an autonomous language had its modest beginnings.

Attitudes about sign language that were prevalent at that time conditioned the form of signing that was presented to us. The received view was that sign language itself had no grammar, and this view was held by hearing and deaf people alike, even by deaf people for whom it was a native language. Apparently, what was not like English was considered "not good language," in fact, not language at all.

As we worked more intimately with deaf signers, we learned more about the special characteristics of their language, and at the same time they became more aware of recurring grammatical patterns.

They even became interested in these patterns as objects of linguistic study. Eventually many of the signers became researchers themselves and actively collaborated with us in our studies. Their solid intuitive grasp of the nuances of the language has enabled the research to go far deeper into the grammatical properties of this visual-manual language than it otherwise could have.

The present book began four years ago in a totally different form, as a collection of working papers from our laboratory. We revised and expanded some of the papers originally designated for the book. Some of the others became completely out of date as our research and discoveries progressed. Several wholly new chapters were written, including all those in the second half of the book. We then revised all the chapters again in order to give the book a unified structure. Since we began working on the book, a lively field of research on sign language has developed, which we have not attempted to review here. We have made no attempt to cover all the ongoing research in our laboratory; thus, we do not include, for example, recent studies in cerebral specialization for signs (Neville and Bellugi, in press) and studies in the syntax of ASL (Liddell 1977). Rather, our objective is to provide an integrated framework for our research on the structure of signs and the morphological processes they undergo. The studies bring linguistic, experimental, and behavioral evidence to bear on the investigation of a language that has developed outside the mainstream of human languages. We have tried to keep the material accessible to the general reader, for it is our view that the problems and questions raised by the study of a language in another modality are of interest beyond the confines of specific academic disciplines.

The arrangement of the chapters generally reflects the order in which the research was conducted, so that for the most part, one chapter builds on another chronologically. The analyses presented here will certainly undergo further revision as the research on the grammar of the language proceeds. There are, for example, complex issues—yet to be resolved—about the nature of the system underlying the inflectional processes; we have already embarked on new studies that promise to illuminate their character. But, alas, we had to stop at some point so that this book could be published. It is quite safe to say that we would still be revising the manuscript now had our editors not gently pried it loose from us.

For us, a very important feature of our research is that it represents the results of a constant close collaboration between hearing and deaf people. To date, several hundred deaf people have taken part in our studies, in many different capacities: as subjects, informants, teachers,

consultants, researchers, and even as storytellers, humorists, and visiting poets. It is to these deaf people that this book is affectionately dedicated.

In a book that spans several years of research in a complicated new field of studies, the debt that we owe to others is great. Our first sign teacher, Bonnie Gough, helped us initiate many of the studies presented here; we are grateful to her for her patience with our fumbling fingers and for the warmth and wit that she shared with us. Ted Supalla and Carlene Canady Pedersen, both from large deaf families, have played crucial roles in our research group over the past three years, leading us through the previously uncharted territory of the grammatical processes in their language. Other deaf people, many of them native signers of American Sign Language, have collaborated with us for intensive but briefer periods of time as researchers, including Joe Castronovo, Julia Hafer, Carol Kassel, Ella Mae Lentz, Venita Lutes-Driscoll, Brian Malzkuhn, Virginia Malzkuhn, David McKee, Dorothy Miles, Shanny Mow, Carol Padden, and Malinda Williams. We have had many close connections with a larger group of deaf people who have been very generous with their time and their creative energies. We are grateful for their spirited involvement in our studies. We particularly want to thank Bernard Bragg, Gilbert Eastman, Larry Fleischer, Betty Newman, Larry Newman, Terry O'Rourke, Jane Wilk, and Lou Fant (as an honorary deaf person). We owe a special debt of gratitude to Carol Newman, who since the age of two has contributed her wit and inventions in her native language.

Our intellectual debt to the people who have collaborated with us on the chapters of the book is great, and we benefited immeasurably from being able to work together with them in our laboratory for extended periods of time. The collaborators and their present affiliations are:

Robbin Battison, Northeastern University (chapter 2)
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Other colleagues and students who have contributed to our research are Scott Liddell, Ryan Tweney, Helen Neville, Howard Poizner, Cheri Adrian, Madeline Maxwell, Darlene Scates, Sharon Newmann Solow,

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Frank A. Paul made all of the illustrations and diligently searched for new ways of displaying the intricacies of movement and space that we demanded from his pen. And finally, we would like to thank Elaine Stevens for her patient typing of the many preliminary versions, and for her sparkle and humor in the process.

E.S.K.
U.B.

Introduction

IMAGINE that you have always lived in a world without sound. In your silent world, without speech and without hearing, how might you accomplish the complex processes of symbolizing and communicating that most of us so readily associate with spoken language? Hundreds of thousands of people live in just such a silent world. They use systems of communication that fulfill the same intellectual, expressive, and social functions as do spoken languages; but instead of being based on signals produced by the voice and perceived by the ear, those systems are based on signals produced by the hands and perceived by the eye. These gestural-visual systems, these so-called sign languages, would be of some interest even if they were essentially based on the language of the surrounding speaking community—if for example, gestural symbols were simply substituted for the spoken words of an English sentence. But if there are sign languages that are separate languages that have taken their own course of development in a modality different from that in which spoken languages have developed, then such gestural-visual systems could offer radically new perspectives in the investigation of the human capacity for language and the form that language takes.

Until very recently all that we have learned about human language has been learned from the study of spoken language. In fact, the very concept of *language* as linguists have understood the term entails complex organizational properties that have often been thought to be intimately connected with vocally articulated sounds. Certainly the evidence suggests that human languages have been forged and developed throughout man's evolution in auditory-vocal channels. History records not a single instance of a community of hearing people who had a sign language rather than a spoken language as their primary, native language: speech is clearly the preferred system.

comprehension, and take care to modify or repeat their messages. The complexity of linguistic systems, which makes them capable of extremely precise and subtle distinctions of meaning, led Sapir to describe language in the following eloquent terms: "It is somewhat as though a dynamo capable of generating enough power to run an elevator were operated almost exclusively to feed an electric doorbell" (p. 14). The study of a communication system lacking such built-in power would have been equally interesting to us. What aroused our interest was the opportunity to study a language that had developed in an unexpected and different mode.

American Sign Language turned out to be in fact a complexly structured language with a highly articulated grammar, a language that exhibits many of the fundamental properties linguists have posited for all languages. But the special forms in which such properties are manifested turn out to be primarily a function of the visual-gestural mode.

Part I of this book introduces the issue of a fundamental difference between ASL and spoken languages. The newcomer to sign language, the researcher, the analyst, even the native signer, is first, second, and last struck by the iconicity that pervades the language at all levels. Characteristically, lexical items themselves tend to be globally iconic, their form resembling some aspect of what they denote. At the morphological and syntactic levels also there is often congruence between form and meaning. Spoken languages are not without such direct clues to meaning: reduplication processes (expressing plurality) and ideophones, as well as onomatopoeic words of spoken languages, provide direct methods of reflecting meaning through form. But in sign language such transparency is pervasive. It is nonetheless true that signs, like the words of spoken language, exhibit sublexical structure. Part I describes our early understanding of these two faces of signs: the iconic face and the encoded, arbitrary face.

Part II presents experimental studies and linguistic analyses that examine various threads of evidence about the internal structural properties of signs. We did not ask whether the underlying system is the same as in speech, but rather to what degree there is evidence of any kind of system, of constraints on the form of signs.

Part III concerns the issue of morphological processes in ASL. What kind of processes does the language provide for the combination and elaboration of its lexical units? What forms do these processes take? How are these forms related to the language mode? What clues do such processes hold to the structure of languages independent of the mode—to characteristics that are perhaps a direct function of basic human cognitive processing?

Language has other functions than to provide ways of making statements, asking questions, and giving commands. Part IV illustrates the very special use of ASL in linguistic play and in poetry—forms that directly manifest the interplay between iconic and systematic aspects of the language, and show manipulation of its most distinctive structural characteristics: its conflation, simultaneity, and use of space.

The iconic sign BUTTERFLY (photographer, Jerry Miller).