

Preface

Language makes us human. It is an intrinsic part of us. We learn it, we use it, and we seldom think about it. But once we start thinking about it, language seems like a sheer wonder. Language is an extremely complex entity with several subcomponents responsible for the language sound, the word's meaning, and the grammatical rules governing the relation between words.

I first realized that there are indeed such subcomponents of language when I worked as a student in a clinic of language-impaired individuals. On one of my first days in the clinic I was confronted with a patient who was not able to speak in full sentences. He seemed quite intelligent, was able to communicate his needs, but did so in utterances in which basically all grammatical items were missing—similar to a telegram. It immediately occurred to me: if grammar can fail separately after a brain injury, it must be represented separately in the brain. This was in 1973. At this time structural brain imaging such as computer tomography was only about to develop and certainly not yet available in all clinics.

Years later in 1979, when I spent my postdoctoral year at the Massachusetts Institute of Technology (MIT) and at the Boston Veterans Hospital of the Boston University, the neurologist Norman Geschwind was one of the first to systematically relate sensory and cognitive impairments to particular brain sites in vivo by means of computer tomography. In his clinical seminars he examined a given patient behaviorally and from this predicted the site of the patient's brain lesion. Then the computer tomographic picture of the patient's brain lesion was presented. Norman Geschwind most of the time had made the correct prediction, thereby providing impressive evidence for a systematic relation between brain and behavior.

Today, more than 35 years later, our knowledge about the relationship between brain and cognitive behavior has dramatically increased due to the advent of new brain imaging techniques such as functional magnetic resonance tomography. This is in particular true for the domain of language thanks to studies that were guided and informed by linguistic theory.

Linguistics provides a systematic description of the three relevant language components: the sound of language, its semantics (dealing with the meaning of words and word combinations), and its syntax (dealing with the grammatical rules determining the combination

of words). All these different components have to work together in milliseconds in order to keep track of online language use. If we want to understand language we first have to disentangle this complex entity into its relevant pieces—its subcomponents—and then see how they work together to make language use possible. It is like a mosaic, in that once all the pieces are in place a coherent picture will evolve.

In *Language in Our Brain* I will provide a description of the relevant brain systems in support of language with its subcomponents, how they develop during the first years of life, and, moreover, how they possibly emerged during evolution.

For this book I drew primarily from empirical data on the language-brain relationship available in the literature. Parts of it come from articles I have written together with my students and colleagues. It is the work and discussions with them on which the view laid down here is built. My thanks go to all who have been working with me over the years.

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Language in Our Brain

The Origins of a Uniquely Human Capacity

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Language in Our Brain: The Origins of a Uniquely Human Capacity

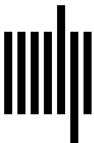
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