An Introduction to Language 9e

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language faculty. We can think of UG as the basic blueprint that all languages follow. It specifies the different components of the grammar and their relations, how the different rules of these components are constructed, how they interact, and so on. It is a major aim of **linguistic theory** to discover the nature of UG. The linguist's goal is to reveal the "laws of human language" as the physicist's goal is to reveal the "laws of the physical universe." The complexity of language, a product of the human brain, undoubtedly means this goal will never be fully achieved. All scientific theories are incomplete, and new hypotheses must be proposed to account for new data. Theories are continually changing as new discoveries are made. Just as physics was enlarged by Einstein's theories of relativity, so grows the linguistic theory of UG as new discoveries shed new light on the nature of human language. The comparative study of many different languages is of central importance to this enterprise.

The Development of Grammar

> How comes it that human beings, whose contacts with the world are brief and personal and limited, are nevertheless able to know as much as they do know?
>
> **BERTRAND RUSSELL,** *Human Knowledge: Its Scope and Limits*, 1948

Linguistic theory is concerned not only with describing the knowledge that an adult speaker has of his or her language, but also with explaining how that knowledge is acquired. All normal children acquire (at least one) language in a relatively short period with apparent ease. They do this despite the fact that parents and other caregivers do not provide them with any specific language instruction. Indeed, it is often remarked that children seem to "pick up" language just from hearing it spoken around them. Children are language learning virtuosos—whether a child is male or female, from a rich family or a disadvantaged one, grows up on a farm or in the city, attends day care or has home care—none of these factors fundamentally affects the way language develops. Children can acquire any language they are exposed to with comparable ease—English, Dutch, French, Swahili, Japanese—and even though each of these languages has its own peculiar characteristics, children learn them all in very much the same way. For example, all children go through a babbling stage; their babbles gradually give way to words, which then combine into simple sentences. When children first begin to produce sentences, certain elements may be missing. For example, the English-speaking two-year-old might say *Cathy build house* instead of *Cathy is building the house*. On the other side of the world, a Swahili-speaking child will say *mbuzi kula majani*, which translates as "goat eat grass," and which also lacks many required elements. They pass through other linguistic stages on their way to adultlike competence, and by about age five children speak a language that is almost indistinguishable from the language of the adults around them.

In just a few short years, without the benefit of explicit guidance and regardless of personal circumstances, the young child—who may be unable to tie her shoes or do even the simplest arithmetic computation—masters the complex grammatical structures of her language and acquires a substantial lexicon. Just

pathways that adults use. These results indicate that at birth the left hemisphere is primed to process language, and to do so in terms of the specific localization of language functions we find in the adult brain.

What is more, these studies have shown that early stages of phonological and syntactic processing do not require attentional resources but are automatic, very much like reflexes. For example, even *sleeping* infants show the asymmetrical and distinct processing of phonological versus equally different but nonlinguistic acoustic signals; and adults are able to perform a completely unrelated task, one that takes up considerable attentional resources, at the same time they are listening to sentences, without affecting the nature or degree of the brain activity that is the neural reflex of automatic, mandatory early syntactic processing.

Experimental evidence from these various neurolinguistic techniques has provided empirical confirmation for theories of language structure. For example, ERP, fMRI, PET, and MEG studies provide measurable confirmation of discrete speech sounds and their phonetic properties. These studies also substantiate linguistic evidence that words have an internal structure consisting of *morphemes* (chapter 3) and belong to categories such as nouns and verbs. Neurolinguistic experiments also support the mental reality of many of the syntactic structures proposed by linguists. Thus neurolinguistic experimentation provides data for both aspects of neurolinguistics: for helping to determine where and how language is represented and processed in the brain, and for providing empirical support for concepts and hypotheses in linguistic theory.

The results of neurolinguistic studies, which use different techniques and different subject populations, both normal and brain damaged, are converging to provide the information we seek on the relationship between the brain and various language and nonlanguage cognitive systems. However, as pointed out by Professors Colin Phillips and Kuniyoshi Sakai,

> . . . knowing where language is supported in the human brain is just one step on the path to finding what are the special properties of those brain regions that make language possible. . . . An important challenge for coming years will be to find whether the brain areas implicated in language studies turn out to have distinctive properties at the neuronal level that allow them to explain the special properties of human language.[2]

The Autonomy of Language

In addition to brain-damaged individuals who have lost their language ability, there are children without brain lesions who nevertheless have difficulties in acquiring language or are much slower than the average child. They show no other cognitive deficits, they are not autistic or retarded, and they have no perceptual problems. Such children are suffering from **specific language impairment**

[2]Phillips, C., and K. L. Sakai. 2005. Language and the brain. *Yearbook of science and technology 2005*. Boston: McGraw-Hill Publishers.

played in language evolution. Lateralization certainly makes greater specialization possible. Research conducted with birds and monkeys, however, shows that lateralization is not unique to the human brain. Thus, while it may constitute a necessary step in the evolution of language, it is not a sufficient one.

We do not yet have definitive answers to the origin of language in the human brain. The search for these answers goes on and provides new insights into the nature of language and the nature of the human brain.

Summary

The attempt to understand what makes the acquisition and use of language possible has led to research on the brain-mind-language relationship. **Neurolinguistics** is the study of the brain mechanisms and anatomical structures that underlie linguistic competence and performance. Much neurolinguistic research is centered on experimental and behavioral data from people with impaired or atypical language. These results greatly enhance our understanding of language structure and acquisition.

The brain is the most complex organ of the body, controlling motor and sensory activities and thought processes. Research conducted for more than a century has shown that different parts of the brain control different body functions. The nerve cells that form the surface of the brain are called the **cortex**, which serves as the intellectual decision maker, receiving messages from the sensory organs and initiating all voluntary actions. The brain of all higher animals is divided into two parts called the **cerebral hemispheres**, which are connected by the **corpus callosum**, a network that permits the left and right hemispheres to communicate.

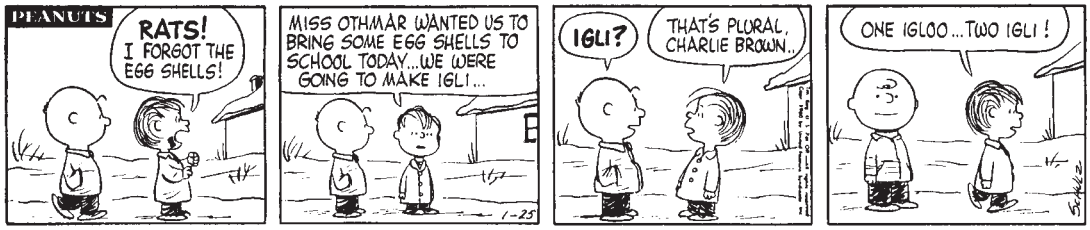
Each hemisphere exhibits **contralateral** control of functions. The left hemisphere controls the right side of the body, and the right hemisphere controls the left side. Despite the general symmetry of the human body, much evidence suggests that the brain is asymmetric, with the left and right hemispheres **lateralized** for different functions.

Neurolinguists have many tools for studying the brain, among them **dichotic listening** experiments and many types of scans and electrical measurements. These techniques permit the study of the living brain as it processes language. By studying **split-brain** patients and **aphasics,** localized areas of the brain can be associated with particular language functions. For example, lesions in the part of the brain called **Broca's area** may suffer from **Broca's aphasia**, which results in impaired syntax and **agrammatism**. Damage to **Wernicke's area** may result in **Wernicke's aphasia**, in which fluent speakers produce semantically anomalous utterances, or even worse, **jargon aphasia**, in which speakers produce nonsense forms that make their utterance uninterpretable. Damage to yet different areas can produce **anomia**, a form of aphasia in which the patient has word-finding difficulties.

Deaf signers with damage to the left hemisphere show aphasia for sign language similar to the language breakdown in hearing aphasics, even though sign language is a visual-spatial language.

Other evidence supports the lateralization of language. Children who undergo a left **hemispherectomy** show specific linguistic deficits, whereas other cognitive

Exceptions and Suppletions



The morphological process that forms plural from singular nouns does not apply to words like *child*, *man*, *foot*, and *mouse*. These words are exceptions to the English inflectional rule of plural formation. Similarly, verbs like *go*, *sing*, *bring*, *run*, and *know* are exceptions to the inflectional rule for producing past tense verbs in English.

When children are learning English, they first learn the regular rules, which they apply to all forms. Thus, we often hear them say *mans* and *goed*. Later in the acquisition process, they specifically learn irregular plurals like *men* and *mice*, and irregular past tense forms like *came* and *went*. These children's errors are actually evidence that the regular rules exist. This is discussed more fully in chapter 8.

Irregular, or **suppletive**, forms are treated separately in the grammar. That is, one cannot use the regular rules of inflectional morphology to add affixes to words that are exceptions like *child/children*, but must replace the uninflected form with another word. It is possible that for regular words, only the singular form need be specifically stored in the lexicon because we can use the inflectional rules to form plurals. But this can't be so with suppletive exceptions, and *children*, *mice*, and *feet* must be learned separately. The same is true for suppletive past tense forms and comparative forms. There are regular rules—suffixes *-ed* and *-er*—to handle most cases such as *walked* and *taller*, but words like *went* and *worse* need to be learned individually as meaning "goed" and "badder."

When a new word enters the language, the regular inflectional rules generally apply. The plural of *geek*, when it was a new word in English, was *geeks*, not **geeken*, although we are advised that some geeks wanted the plural of *fax* to be **faxen*, like *oxen*, when *fax* entered the language as a shortened form of *facsimile*. Never fear: its plural is *faxes*. The exception to this may be a word "borrowed" from a foreign language. For example, the plural of Latin *datum* has always been *data*, never *datums*, though nowadays *data*, the one-time plural, is treated by many as a singular word like *information*.

The past tense of the verb *hit*, as in the sentence "Yesterday you hit the ball," and the plural of the noun *sheep*, as in "The sheep are in the meadow," show that some morphemes seem to have no phonological shape at all. We know that *hit* in the above sentence is *hit* + *past* because of the time adverb *yesterday*, and we know that *sheep* is the phonetic form of *sheep* + *plural* because of the plural verb form *are*.