

Book reviews

David Caplan: *Neurolinguistics and Linguistic Aphasiology. An Introduction*. Cambridge: Cambridge University Press, 1987. xii + 498 pp. £10.95.

In many cases, a stroke to certain areas of the left hemisphere and, in some cases, a stroke to areas in the right hemisphere causes severe disturbances of the capacity to produce and/or understand language. These disturbances are known as aphasia and are classically divided in different types (for example, Broca's aphasia, Wernicke's aphasia, anomia, conduction aphasia) on the basis of different sets of symptoms. Serious research on aphasia started with the famous address by Paul Broca before the Anthropological Society of Paris in 1861, in which he argued on the basis of anatomical and behavioral evidence from his patient Leborgne that the frontal lobes are the seat of the 'faculty of articulate language'. For more than a century, aphasia research has been dominated by neurologists, mainly interested in the clinico-pathological aspects of the relation between language and the brain. In the last decade, however, aphasiology has undergone the growing influence of linguistics and psycholinguistics. Linguistic theories and psycholinguistic research methods have had a rapidly growing impact on the field, which has now become strongly interdisciplinarian in character. Those working in the area of aphasia research, therefore, must be familiar with concepts and theories from the neurosciences, linguistics, and psycholinguistics. In addition to this diversity of disciplines, recent years especially have seen a bewildering diversity of models and opinions on the nature of aphasic deficits. One can find a whole range of positions between, on the one hand, the view that the clinically different symptomatology of Broca (agrammatic) and Wernicke (paragrammatic) patients is merely the superficial expression of one common underlying language deficit (Heeschen 1985), and, on the other hand, the position that patients grouped together on the basis of their superficial similarity in symptoms (for example,

agrammatics) on closer inspection reveal a number of very different language deficits (Badecker and Caramazza 1985).

Students entering the field of aphasia research would, therefore, profit enormously from an introductory textbook that guides them through this maze of disciplines and models. David Caplan has provided the field with such a textbook, which is a valuable source not only for students but also for the experts in this domain of science.

The book is divided into four parts. The first part is an introduction to the rest of the book, in which Caplan sketches the philosophical and methodological aspects of neurolinguistics as well as the main forms of argumentation and experimental techniques used by neurolinguists. A central philosophical issue for neurolinguistics is whether or not one can assume a one-to-one relation between linguistic structures and psycholinguistic processes, on the one hand, and neuroanatomical structures and neurophysiological processes, on the other. In other words, is the relation between the natural kinds of linguistics and psycholinguistics (such as phonemes, words, syntax, etc.) and the natural kinds of the neurosciences (such as neurons, synapses, convolutions, etc.) in principle transparent enough to make neurolinguistics a viable enterprise? Caplan argues that we cannot yet answer this question, because we still don't know enough about the linguistic and neural structures and their relationship. True as this may be, much research in neurolinguistics implicitly assumes that there must be a relatively straightforward relation between language and the brain. In my opinion, research in this area would benefit from explicit conceptual analyses of the possible ways in which brain and language might be related and of their consequences for neurolinguistic research (see Mehler et al. 1984).

The second part of the book is called 'Clinical aphasiology and neurolinguistics'. In this part Caplan gives an historical overview starting with Paul Broca's discovery of the frontal lobes as the seat of language. He makes a major historical distinction between the tradition of the 'localizationists' (such as Broca, Wernicke, Geschwind) and the tradition of the 'holists' (such as Jackson, Goldstein). According to the 'localizationists' the different subcomponents of the language faculty are to be localized in different centers of the brain connected with each other by different fiber tracts. Based on the view that language mainly consists of words, the famous Wernicke-Lichtheim schema specifies separate but interconnected centers for word sounds, concepts, and the motor schemas for word production. In contrast to the 'localizationists', the 'holists' argued that neither the brain nor language should be seen as a set of separate subparts but that they form integrated units. Due to this integrated and hierarchical organization, removing (damaging) one subcomponent will

lead to a change in the complete system. The holists deny that one can isolate the different subcomponents of the language system. Caplan correctly points out that although the terms 'localizationist' and 'holist' are associated with different views of the brain, the fundamental disagreement is about what must be included in models of the psychology of language. 'The neural mechanisms follow the psychological analyses, in this respect' (p. 136). Although many aspects of the classical positions can still be found in modern theories on aphasia, Caplan remarks that this older work within the tradition of clinical neurology falls short of the more sophisticated levels of description of language representations and language processing of today's models of our language faculty.

These more sophisticated levels of description are a main topic in the third part of the book with its focus on 'linguistic aphasiology'. Whereas neurolinguistics aims at relating language to the brain, in linguistic aphasiology one tries to relate the aphasic deficits to our theories of normal language structure and processing. The hope is that in this way we will learn more, both about the nature of aphasic disturbances and about the intact language-processing system. Caplan reviews some of the research on aphasic disturbances at the levels of lexical-semantic, phonological, and syntactic processing. The different chapters start with short introductions into the fields of phonology, syntax, and semantics, adopting the philosophy of 'discussing a few aphasic symptoms in detail in relationship to normal processes, rather than presenting a general survey of a large number of studies ...' (p. 261). The chapter on disturbances of sentence comprehension, for example, starts with a short introduction into the core notions of GB syntax and some current proposals on parsing. After discussing the classical studies on comprehension deficits in agrammatic patients (such as the studies by Caramazza and Zurif 1976 and Schwartz et al. 1980), a few of the more recent studies on agrammatism within the GB framework are discussed. Grodzinsky (1986), for instance, has argued that the failure of agrammatics to understand passive sentences is due to their inability to coindex the trace in the passive with the subject NP. In a sentence like 'The dancer_i was applauded t_i by the actor', agrammatics therefore take both the subject NP and the NP in the by-phrase as agents, leading to an ambiguous sentence. Caplan cites evidence especially from studies by himself and his colleagues (for an extensive review, see Caplan and Hildebrandt 1988), which indicates that this cannot be the whole story. These studies, in which subjects were presented with a number of different sentence constructions and were required to indicate the thematic roles of the NPs by manipulating toy animals, showed a lot of variation in the ability to assign structure among agrammatic patients; moreover, the same pattern of comprehension disorders was found in other types

of aphasia. Caplan concludes that the 'uniformity, specificity, and ubiquity of a syntactic comprehension deficit in agrammatism is therefore called into question' (p. 319). In the remainder of this chapter, Caplan discusses the role of short-term memory impairments in sentence-comprehension disorders. He suggests that in addition to specific syntactic disorders (for example, a difficulty in coindexing traces), general limitations in the resources necessary for parsing contribute to the sentence-comprehension disturbances seen in aphasics.

The fourth part of the book is called 'Contemporary neurolinguistics'. It reviews the more recent work on language-brain relations. Caplan discusses, among other things, results from electrical stimulation of the language areas in the brain, the recording of brain potentials during language processing, and some recent modeling of aphasic deficits within the PDP framework. Despite the enormous progress in brain-imaging techniques (such as CT-scan, positron-emission tomography, recording of brain potentials), we still do not know much more than that language is localized in the perisylvian area of the language-dominant cortex. How the different subcomponents of the language-processing system are hardwired in the brain is even today an almost complete mystery. Caplan argues that this sorry state is partly due to the traditional approach in neurolinguistic theory of allocating language-related tasks (such as speaking, reading, and auditory comprehension) to areas of the cortex on the basis of their sensory or motor aspects. Instead, he advocates a more psycholinguistically oriented approach that looks for the neural substrates of specific subcomponents of the language-processing system. Although this does not guarantee progress in neurolinguistics, I fully agree that looking for language-brain relations along the joints and junctures of psycholinguistic models is the more promising route.

In conclusion, David Caplan has succeeded in writing a skillful and comprehensive introductory textbook to the fields of neurolinguistics and linguistic aphasiology. It does not, however, provide us with a synthesis of the different approaches to the study of aphasia. As the title of the book suggests, neurolinguistics and linguistic aphasiology are two rather separate disciplines. In fact, they have less in common than one might think on the face of it. Giving a detailed account both of the functional architecture of the language faculty and of the way its components are hardwired in the brain is, however, beyond anybody's reach today. Nevertheless, Caplan's book certainly is a very valuable introduction to the different disciplines composing the conglomerate called aphasiology. As such it will find its way and have its influence among students entering this field of science.

References

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Theo Venneman: *Preference Laws for Syllable Structure and the Explanation of Sound Change*. Berlin: Mouton de Gruyter, 1988.

This book has been difficult to review, because, although there is much in it that is interesting and some that is new, it is not clear to me that it ought to have been a BOOK, as opposed to a review article. The actual text occupies 68 pages, which seems slight even for the low price of US\$8.25.

Another difficulty is that the state of phonological theory is no longer what it once was. This is not to say that things have improved, but that there is probably less of a market for this book, at least in North America, than there once was. This is a book that is a catalog of possible sound changes that are dependent upon syllable structure, coupled with a theory about phonological strength. It is, however, not written using any 'official' phonological theory, either present or past. Venneman's sympathies clearly lie with one or the other of the 'natural' schools of phonology (in the past he has been associated with natural generative phonology). He says, for example, that his preference laws 'have their basis in the human productive and perceptive endowment' (p. 4), but he does not feel the need to ground his explanations in phonetics — 'since I am not a phonetician, I will make no attempt to explain my preference laws for syllable structure' (p. 4). There are virtually no references to any current descendants of generative phonology, which is a pity, since at least some recent work, notably theories dealing with the organization of features