Neurolinguistics

What biological factors make human communication possible? How do we process and understand language? How does brain damage affect these mechanisms, and what can this tell us about how language is organized in the brain? The field of neurolinguistics seeks to answer these questions, which are crucial to linguistics, psychology and speech pathology alike. Drawing on examples from everyday language, this textbook introduces the central topics in neurolinguistics: speech recognition, word and sentence structure, meaning, and discourse – in both 'normal' speakers and those with language disorders. It moves on to provide a balanced discussion of key areas of debate such as modularity and the 'language areas' of the brain, 'connectionist' versus 'symbolic' modelling of language processing, and the nature of linguistic and mental representations. Making accessible over half a century of scientific and linguistic research, and containing extensive study questions, it will be welcomed by all those interested in the relationship between language and the brain.

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For Carolyn

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Preface and acknowledgements

This book is intended as a self-contained introduction to the study of the language–brain relationship for students of cognitive science, linguistics and speech pathology. The essentially interdisciplinary nature of the subject matter posed considerable difficulties for the author and will likely do so also for the reader. So please be warned. Despite my considerable efforts to keep the pathways open between the villages of the cognate disciplines concerned, the jungle is everywhere and its capacity for re-growth is relentless.

As appropriate for an introductory text, the book is accessible to a wide readership. Foundational concepts and issues on the nature of language, language processing and brain language disorders (aphasiology) are presented in the first four chapters. This section of the book should be complementary with many standalone introductory courses in linguistics, psychology or neuroanatomy. Subsequent sections deal with successively 'higher' levels of language processing and their respective manifestations in brain damage: speech perception (chapters 5–8); word structure and meaning (lexical processing and its disorders; chapters 9–11); syntax and syntactic disorder (agrammatism; chapters 12–14); discourse and the language of thought disorder (chapters 15–16), followed by a brief final chapter, speculating on unsolved problems and possible ways forward. Each major section of the book begins by posing the principal questions at an intuitive level which is hopefully accessible to all. The often quite specialized research methods by which answers to these questions have been sought are then introduced, in a selective review of the literature.

The field of relevant studies was broad to begin with and has grown vastly since the pioneering studies in psycholinguistics, neurolinguistics and computational models of language processing were undertaken in the 1970s and surveyed with such flair and scholarship in Caplan's *Neurolinguistics and linguistic aphasiology: An introduction* (1987). It would be an impossible task to update Caplan's seminal text in a single volume. Yet that was one of the quixotic goals that originally motivated the writing of this book. So, in each of the major topics that are taken up, the aim is to bring the reader to a view of the problems and issues that animate contemporary research. In this sense, the book is intended as an 'introduction' to the field and as such may serve as a resource for an advanced undergraduate or first-year graduate seminar.

It is difficult to date precisely the origins of this book and therefore to duly acknowledge the many people who have contributed towards it. But officially it

began life as a collaboration with Helen Chenery, under the enthusiastic mentorship of Christine Bartels of Cambridge University Press. Helen's ghost-like presence can be detected in the persistence of the authorial 'we', a writing habit that I evidently found hard to break and a device that I may be guilty of deploying at times, to persuade the reluctant reader to my point of view on matters of deep uncertainty. I am grateful to both of them for their support and wise editorial counsel, especially through the difficult early stages, where something is taking shape, but God knows what the outcome will be and the enormity of the task ahead is beginning to sink in.

Neil Smith read the entire manuscript – not once, but twice – and offered many invaluable and always tactfully put suggestions. I am greatly indebted also to Lucy Carolan, whose impeccable stylistic judgement greatly improved the readability of the text. Max Coltheart and Stephen Crain read selected chapters and offered cogent feedback. Thanks particularly to the students who read drafts of these chapters and in some cases showed in their term essays how the story could be better told. Teaching can be a humbling experience and nothing motivates hard thinking like the blank stares that can accompany the presentation of one's latest pearls of wisdom. Most importantly, I would like to thank my wife, whose name appears in the dedication, for putting up with a distracted fool for several years of late nights and the squeaking chair in the wee hours.

Note on the text

Words in bold type are explained in the Glossary (pp. 380–6 below).