

**LANGUAGE PROCESSING  
IN BILINGUALS:  
Psycholinguistic and  
Neuropsychological  
Perspectives**

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**LEA** LAWRENCE ERLBAUM ASSOCIATES, PUBLISHERS  
1986 Hillsdale, New Jersey London

After having had a fairly marginal status in psychology for the better part of this century, the study of bilingual cognitive functioning has gradually come of age. Increased interest in bilingualism may reflect a growing recognition of the fact that, viewed globally, bi- or multilingualism is the rule rather than the exception (Grosjean, 1982).

Psycholinguistic and neuropsychological perspectives on bilingualism have developed more or less independently. Psycholinguistic approaches have their origin in studies conducted in the 1940s to 1960s on the relationship between bilingualism and intelligence or concept formation (Hakuta, 1986), in the debate over the existence of a switch mechanism, and in the literature on independent versus interdependent forms of bilingual language organization, and the influence of context of language acquisition on language functioning. Psycholinguistic research with bilinguals has in recent years shifted from these concerns to considerations of the nature of the bilingual lexicon, individual differences in cognitive functioning (see Djouider, 1986), visual word recognition, memory for bilingual discourse, and the acquisition (see Goodz, 1986), perception and production of mixed language.

Neuropsychological perspectives on bilingualism date back to early neurological writings about patterns of language impairment and recovery in bilingual or polyglot aphasics, and about the possibility of differential localization of language in the brain. These topics, together with studies of cerebral hemispheric specialization of language in brain-intact bilinguals, are still being studied in current research on the bilingual brain.

Since systematic, experimental investigations of both psycholinguistic and neuropsychological aspects of bilingualism are still fairly new, it may take some

time before the two perspectives develop a common theoretical framework. Yet, as a few of the selections in the current volume indicate, some convergence is already taking place.

The aim of the present collection is to articulate current thinking about critical issues within the psychology of bilingualism, issues bearing on language perception, retention, organization, interaction, acquisition, and impairment in users of two or more languages. The contributors to this volume include psychologists, linguists and neurologists, all of whom share a longstanding interest in bilingualism, most having already published widely on the topic. Where recent texts (e.g., Grosjean, 1982) have introduced readers to the different facets of bilingualism, the present work is directed at those already somewhat acquainted with the field and interested in contributing to it or in reflecting on its contribution to their own focus of inquiry.

The thirteen chapters in this volume are organized into two sections, one focusing primarily on psycholinguistic issues, the other on neuropsychological approaches.

#### Psycholinguistic Perspectives

This section begins with a chapter by Norman Segalowitz who sets out to account for slower second language reading in even highly skilled bilinguals. Reviewing a set of studies conducted in his laboratory, Segalowitz presents evidence for differences between the first and second language in the way automatic versus controlled processes, semantic activation, and phonological recoding operate, during reading in skilled bilinguals.

Kim Kirsner in the next chapter examines lexical processing in bilinguals and monolinguals with a view to evaluating the impact of bilingualism on the delimitation of lexical entries. After reviewing studies on word frequency and repetition effects, attribute retention and semantic priming in a variety of language pairs, Kirsner concludes that bilingual lexical representation does not differ from that of monolinguals and that morphology, rather than language, defines the boundaries between lexical categories.

The next two chapters are concerned with the effectiveness of different input presentation conditions for retention of information in bilinguals. Kirsten Hummel begins with a review of the bilingual memory literature, which has essentially focused on single words presented out of context, and then reviews general studies of memory for discourse as a function of encoding context. She concludes with a novel finding that memory for prose is far superior under bilingual than unilingual presentation conditions.

In the chapter that follows, Wallace Lambert examines the effects on second language learning of different pairings of first and second language script and spoken dialogue. His findings, derived from an extensive set of experiments with French-English speakers, are unexpected and rich in their theoretical and pedagogical implications.

Issues of language learning are examined somewhat differently in the chapter by Edith Magiste, who summarizes her work on immigrant students in Germany and Sweden. Using response time measures on various elementary encoding and decoding language tasks, Magiste presents data on the influence of length of residence in the host country on the attainment of comparable levels of speeded performance in two languages, and discusses issues of language interference, automaticity, and optimal conditions for second and third language learning.

The psycholinguistics section concludes with two chapters that address the phenomenon of intrasentential code-switching. Miwa Nishimura examines the phenomenon from a theoretical perspective, focusing on the question of whether or not code-mixed sentences can be assigned a host language. Where previous studies of code-mixing have tended to use languages with a similar word order, Nishimura makes use of a Japanese-English corpus to argue the case for language assignment.

In the final chapter of this section, Grosjean and Soares present preliminary evidence from their ongoing research on the phonetic and prosodic accompaniments of code switched utterances, the on-line perception of code switches, and lexical access of code-switches versus language borrowings.

### Neuropsychological Perspectives

The first wave of research on neuropsychological aspects of bilingual language experience may be said to have ended with the publication of a comprehensive anthology of the largely European literature on polyglot aphasia (Paradis, 1983). Currently, several new studies on brain-injured and normal populations are at various stages of completion in different laboratories and it will be some time before their findings become ready for dissemination. In the selections for this portion of the book, I have avoided including reviews of the bilingual aphasia and lateralization literature, as a number of such reviews are already available (e.g., Albert & Obler, 1978; Vaid, 1983). I have opted instead to include preliminary reports from ongoing research projects and literature reviews of interesting sub-populations that have not yet received sufficient attention.

The first two chapters in this section are concerned with bilingual aphasia. Prithika Chary summarizes data from a larger project on the assessment of aphasia in multilingual speakers of Dravidian languages in South India. In her study of a group of bilingual aphasics, patients were randomly selected, thereby eliminating the danger of a sampling bias, a problem that has made much of the earlier aphasia literature suspect. A particularly interesting finding from her study is the high incidence of crossed aphasia in polyglots (similar to previous reports in the literature) but, unlike previous estimates, crossed aphasia in Chary's monolingual sample is also fairly high.

Beverly Wulfeck, Larry Juarez, Elizabeth Bates, and Kerry Kilborn use a sentence interpretation paradigm adapted from ongoing cross-linguistic research

by Bates and Brian MacWhinney and present evidence from healthy and aphasic Spanish-English bilinguals for individual differences in modes of interpreting grammatically ambiguous sentences. They find that the performance of bilinguals on this task differs from that of their monolingual counterparts and reflects an amalgam of strategies from the two languages.

The next two chapters address changes in language and in lateralization as a function of language experience. Loraine Obler, Martin Albert and Sandra Lozowick compare the performance of healthy bilinguals and monolinguals in their 70s on a range of language and non-language tasks drawn from a larger project by Obler and Albert at the Boston V.A. Medical Center on language and dementia.

Looking at developmental issues from the other end of the lifespan, Eta Schneiderman integrates three bodies of literature—on child language, the role of the right hemisphere in language, and lateralization of language in proficient and non-proficient bilinguals—in an attempt to develop a coherent theoretical framework for the study of hemispheric specialization of language, whether a first or a second language.

The last two chapters of the book focus on lateralization of language in special populations—users of the Chinese writing system and of signed languages. Catherine Kettrick and Nancy Hatfield consider a population whose bilingualism has not generally been studied, or even acknowledged, despite its rather unique features. They review available clinical and experimental neuropsychological studies of deaf and hearing users of signed and spoken language.

In the final chapter, Reiko Hasuike, Ovid Tzeng, and Daisy Hung examine script-related differences in hemispheric specialization of written language, specifically, differences between kanji and kana processing. They conclude that, whatever differences there might be between the two, these need not be interpreted in terms of a differential reliance on the left and right hemispheres, respectively.

Whether presenting new data or evaluating existing evidence, the chapters in this volume were all written with a view to identifying relevant questions and suggesting viable directions for further approaches to these questions. It is hoped that a joint consideration of psycholinguistic and neuropsychological approaches will advance and refine our understanding of bilingual language functioning.

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## Acknowledgments

This project was supported in part by the John D. and Catherine T. MacArthur Foundation Transition Research Network at the Center for Research in Language, University of California, San Diego, and by National Institute of Health research grants to the Laboratory for Language and Cognitive Studies at the Salk Institute for Biological Studies, San Diego. I gratefully acknowledge Drs. Elizabeth Bates and Ursula Bellugi for allowing me the facilities and time needed to devote to this effort during the course of my research appointment at the University of California San Diego and the Salk Institute for Biological Studies.

I thank Harry A. Whitaker for taking an interest in publishing this book in his series and the contributors to this volume for their enthusiasm and cooperation. Helen Neville and David Corina of the Salk Institute for Biological Studies offered useful comments on specific chapters. Karen Hampton and Ann Cooreman of the University of California San Diego assisted me in checking reference and in preparing the index. Sondra Guideman of Laurence Erlbaum Associates did a commendable job of copy-editing.

A number of colleagues have influenced my thinking about bilingualism over the course of the past decade: Wallace E. Lambert, Fred Genesee and Michel Paradis of McGill University, and Loraine Obler, Paul Kolers and François Grosjean, among others. I am indebted to them for their guidance and encouragement. Finally, I want to express my gratitude to Ramdas Menon for seeing me through this project from beginning to end.