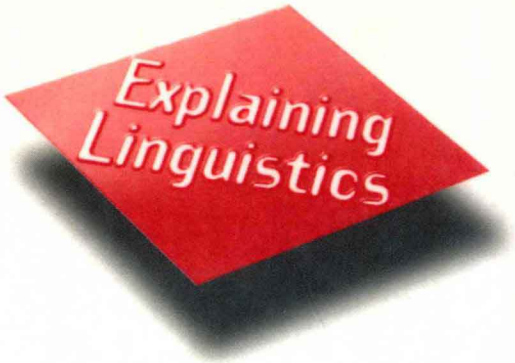

ONE MIND, TWO LANGUAGES

BILINGUAL LANGUAGE PROCESSING

Edited by Janet L. Nicol

One Mind, Two Languages

Bilingual Language Processing

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edited by

Janet L. Nicol
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One Mind, Two Languages

Explaining Linguistics

D. Terence Langendoen, *Series Editor*

This is a series of volumes of essays designed to introduce and explain major research areas in linguistic theory and practice. It is intended for researchers, scholars, and students who have a need or desire to learn more about these areas.

1 *Optimality Theory: An Overview* edited by Diana Archangeli and D. Terence Langendoen

2 *One Mind, Two Languages: Bilingual Language Processing* edited by Janet L. Nicol

This book is dedicated to the memory of ...

My mother, *Marjorie O. Nicol* (1923–1999), who understood only too well the difficulty of learning (and teaching) a second language. She spent many years teaching English as a Second Language in Vancouver, helping to launch new Canadians, children and adults, into schools and jobs (and managing at the same time to raise her own five children).

And my friend and colleague, *Kerry P. Green* (1955–1998), whose idea for us to co-teach a new course on "Language Processing in the Bilingual" in 1993 led, five years later, to the colloquium series on which this book is based.

Thank you both for the inspiration.

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Preface

This volume presents a survey of current research in the area of language processing in the second language learner and bilingual. Theories of language representation and processing are typically centered on the monolingual speaker, and, with a few notable exceptions, the study of bilingual (and multilingual) speakers has historically been the domain of language educators. But bilingualism offers fascinating data to psychology and linguistics. Bilinguals – those who acquired two languages as children and who need both languages in their professional and personal spheres – may help language scientists better understand how words and concepts are stored in memory, how they are retrieved during speaking and understanding, and whether there are shared representations and mechanisms. The study of second language learners may tell us how new knowledge is acquired and represented, whether it is used automatically during language processing, and the extent to which facility in comprehension is linked to facility in production.

The opening chapter by François Grosjean presents guidelines for the study of bilingualism. In doing so, he reviews a number of studies, which have given rise to conflicting results, and discusses how differences in methodology (criteria for subject selection, the language used with subjects, stimulus characteristics, task demands, and so on) are at the root of the conflicts. One factor that is especially easy to overlook for psycholinguists used to testing monolingual subjects is Language Mode: bilingual speakers may be in a "bilingual mode" if they know that they are interacting with another bilingual speaker or if they are presented with stimuli in both of their languages. This could have an effect on their results: they may show less language independence than they would in a "monolingual" communicative setting.

Chapters 2–8 present experimental and corpus data bearing on theoretical issues in language processing. Chapter 2, by Mary Zampini and Kerry Green, reports studies of speech production and perception in monolingual speakers of English and Spanish, second language learners, and English-Spanish bilinguals. Specifically, they tested the production and perception of voiced and voiceless stops, focusing on two acoustic parameters: voice onset time (VOT) and voiceless closure interval.

Chapters 3 and 4 are about the architecture of the lexical system in second language learners. Chapter 3, by Judith Kroll and Natasha Tokowicz, reviews results of a number of studies which explore how the words in a second language are represented with respect to words in the native language (L1) in less proficient and more proficient language learners. In Chapter 4, Kenneth Forster and Nan Jiang explore this issue using a technique in which words are displayed subliminally. When a word in one of a bilingual's two languages is presented for a very brief time – too brief for subjects to be aware of it – it may nonetheless speed up the processing of a subsequent word in the subject's other language.

Chapters 5 and 6 are about sentence production. Chapter 5, by Carol Myers-Scotton and Janice Jake, reviews a body of utterances in which the speaker has changed languages mid-stream. They consider the ramifications of the distribution of such code-switches (where they occur and where they do not) for models of the lexicon and models of language production. Chapter 6, by Janet Nicol, Matthew Teller and Delia Greth, tests reported differences in the computation of subject–verb agreement between English speakers (who have been argued to use a syntactic strategy) and Spanish speakers (who have been shown to use a more conceptual mechanism). They examine whether bilinguals and second language learners show the English pattern when speaking English and the Spanish pattern when speaking Spanish, or whether they use one method of computing agreement. More generally, this research addresses whether language processes may be shared by two languages, and whether such sharing will be more apparent in bilinguals than second language learners.

Chapters 7 and 8 focus on sentence comprehension. In Chapter 7, Montserrat Sanz and Thomas Bever first present psycholinguistic data that Spanish and English comprehenders have different syntactic representations for sentences containing telic verbs (verbs that connote bounded actions): telicity has a syntactic reflex in Spanish, but not English. They then consider possible experimental outcomes for English speakers learning Spanish. Chapter 8, by Paola Dussias, exploits the finding that Spanish and English speakers likely use different strategies for processing specific sentence constructions (sentences containing a relative clause which could modify one of two preceding constituent noun phrases). In her research, she tests whether bilinguals show the English pattern when reading English and the Spanish pattern for Spanish, or whether they show a merged or intermediate pattern. Such research is particularly relevant to exposure-based theories of sentence comprehension, which highlight the role of past experience processing different constructions.

Chapter 9, by Sam Supalla, Tina Wix and Cecile McKee, focuses on the special problem faced by signers in learning to read spoken languages. They consider the challenge that faces children who are proficient in American Sign Language in learning to read English, and present an innovative method for teaching precursor reading skills.

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1

The Bilingual's Language Modes

François Grosjean

Bilinguals who have reflected on their bilingualism will often report that they change their way of speaking when they are with monolinguals and when they are with bilinguals. Whereas they avoid using their other language with the former, they may call on it for a word or a sentence with the latter or even change over to it completely. In addition, bilinguals will also report that, as listeners, they are sometimes taken by surprise when they are spoken to in a language that they did not expect. Although these reports are quite anecdotal, they do point to an important phenomenon, language mode, which researchers have been alluding to over the years. For example, Weinreich (1966) writes that when speaking to a monolingual, the bilingual is subject to interlocutory constraint which requires that he or she limit interferences (Weinreich uses this as a cover term for any element of the other language) but when speaking to another bilingual, there is hardly any limit to interferences; forms can be transferred freely from one language to the other and often used in an unadapted way. A few years later, Hasselmo (1970) refers to three sets of "norms" or "modes of speaking" among Swedish-English bilinguals in the United States: English only for contact with English monolinguals, American Swedish with some bilinguals (the main language used is Swedish), and Swedish American with other bilinguals (here the main language is English). In the latter two cases, code-switching can take place in the other language. The author also notes that there exist two extremes in the behavior of certain bilinguals: one extreme involves minimal and the other maximal code-switching. A couple of years later, Clyne (1972) talks of three communication possibilities in bilingual discourse: in the first, both codes are used by both speakers; in the second, each one uses a different code but the two understand both codes; and, in the third, only one of the two speakers uses and understands both codes whereas the other speaker is monolingual in one of the codes. Finally, Baetens Beardsmore (1982) echoes these views when he writes that bilinguals in communication with other bilinguals may feel free to use both of their language repertoires. However, the same bilingual speakers in conversation with monoglots may not feel the same liberty and may well attempt to maximize alignment on monoglot norms by consciously reducing any formal "interference" features to a minimum.

What is clear from all of this is that, at any given point in time and based on numerous psychosocial and linguistic factors, the bilingual has to decide, usually quite unconsciously, which language to use and how much of the other language is needed – from not at all to a lot. If the other language is not needed, then it will not be called upon or, in neural modeling terms, activated. If on the other hand it is needed, then it will be activated but its activation level will be lower than that of the main language chosen. The state of activation of the bilingual's languages and language processing mechanisms, at a given point in time, has been called the language mode. Over the years, and in a number of publications, I have developed this concept. Already in Grosjean (1982; chapter 6), the bilingual's language behavior was presented in two different contexts: when the bilingual is speaking to a monolingual and when he or she is speaking to a bilingual. The notion of a situational continuum ranging from a monolingual to a bilingual speech mode was presented in Grosjean (1985). In the monolingual speech mode, the bilingual deactivates one language (but never totally) and in the bilingual mode, the bilingual speaker chooses a base language, activates the other language and calls on it from time to time in the form of code-switches and borrowings. The notion of intermediate modes and of dynamic interferences was presented in Grosjean (1989); the latter were defined as those deviations from the language being spoken due to the involuntary influence of the other deactivated language. The expression "language mode" replaced "speech mode" in Grosjean (1994) so as to be able to encompass spoken language, written language as well as sign language, and the current two-dimensional representation of the base language and the language mode was introduced in Grosjean (1997a) as was the notion that language mode corresponds to various levels of activation of the two languages. Finally, in Grosjean (1998a) perception was taken into account, and the many problems that arise from not controlling the language mode sufficiently in bilingualism research were discussed.

Researchers in bilingualism will need to take into account language mode for a number of reasons: it has received relatively little attention in bilingualism research; it gives a truer reflection of how bilinguals process their two languages, separately or together; it helps us understand data obtained from various bilingual populations; it can partly account for problematic or ambiguous findings relating to such topics as language representation and processing, interference, code-switching, language mixing in bilingual children, bilingual aphasics, etc.; and, finally, it is invariably present in bilingualism research as an independent, control or confounding variable and hence needs to be heeded at all times.

In this chapter, language mode will be described, the factors that influence it will be spelled out, and the impact it has on language behavior will be examined. Next, existing evidence for the bilingual's language modes in language production, language perception, language acquisition and language pathology will be described. Language mode as a confounding variable will then be evoked and suggestions for controlling it will be proposed. Finally, future research topics related to language mode such as assessment, processing mechanisms, highly language dominant bilinguals and modeling will be considered.

1 Language Mode

Description

Language mode is the state of activation of the bilingual's languages and language processing mechanisms at a given point in time. Given that activation is a continuous variable ranging from no activation to total activation and that two languages are concerned,[1] language mode is best visualized in a two-dimensional representation such as that in Figure 1.1. The bilingual's languages (A and B) are depicted on the vertical axis by a square located in the top and bottom parts of the figure, their level of activation is represented by the degree of darkness of the square (black for a highly active language and white for a deactivated language) and the ensuing language mode is depicted by the position of the two squares (linked by a discontinuous line) on the horizontal axis which ranges from a monolingual mode to a bilingual mode. Three hypothetical positions are presented in the figure, numbered 1 to 3. In all positions it is language A that is the most active (it is the base language, i.e. the main language being produced or perceived at a particular point in time) and it is language B that is activated to lesser degrees.

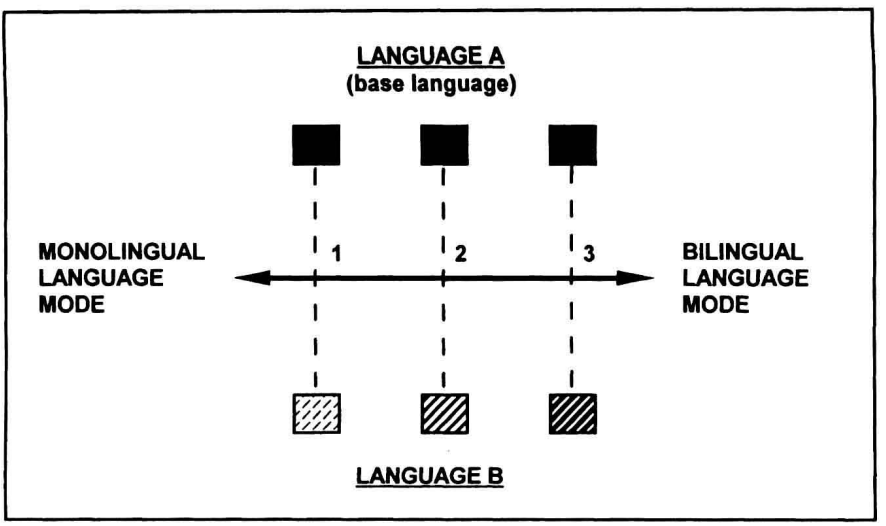

Figure 1.1. Visual representation of the language mode continuum. The bilingual's positions on the continuum are represented by the discontinuous vertical lines and the level of language activation by the degree of darkness of the squares (black is active and white is inactive).[2]

In position 1, language B is only very slightly active, and hence the bilingual is said to be at, or close to, a monolingual language mode. In position 2, language B is a bit more active and the bilingual is said to be in an intermediate mode. And in position 3, language B is

[1] At this stage, only the regular use of *two* languages in relatively stable bilinguals will be considered. People who use three or more languages in their everyday life will be evoked in the last section.

[2] This figure first appeared in Grosjean (1998a). It is reprinted with the permission of Cambridge University Press.

highly active (but not as active as the base language) and the bilingual is said to be in a bilingual language mode. Note that in all three positions, the base language (language A) is fully active as it is the language that governs language processing. Examples taken from production and perception will illustrate these three positions on the continuum. As concerns production, bilingual speakers will usually be in a monolingual mode when they are interacting with monolinguals (speakers of language A in Figure 1.1) with whom they simply cannot use their other language (language B). When they are in this kind of situation, they deactivate their other language (most often unconsciously) so that it is not produced and does not lead to miscommunication. Speakers will be in an intermediate position (such as position 2) when, for example, the interlocutor knows the other language but either is not very proficient in it or does not like to mix languages. In this case, the speaker's other language (language B in the figure) will be only partly activated. And speakers will be in bilingual mode (position 3) when they are interacting with other bilinguals who share their two languages and with whom they feel comfortable mixing languages. In this case, both languages are active but one language (language B in the figure) is slightly less active than the other language (language A) as it is not currently the main language of processing. The same applies to bilingual listeners. In position 1, for example, a bilingual may be listening to a monolingual who is using language A and who simply does not know language B. In position 2, the same person may be listening to another bilingual who very rarely code-switches and borrows from the other language, and in position 3, the listener may be listening to mixed language being produced by his or her bilingual interlocutor.[3]

Language mode concerns the level of activation of two languages, one of which is the base language, and hence two factors underlie the concept. The first is the base language chosen (language A in the above figure) and the second is the comparative level of activation of the two languages (from very different in the monolingual mode to quite similar in the bilingual mode). As these two factors are usually independent of one another (for possible exceptions, see section 4), there can be a change in one without a change in the other. Thus, the base language can be changed but not the comparative level of activation of the two languages (e.g. a bilingual can change the base language from A to B but remain in a bilingual mode). Similarly, there can be a change in the comparative level of activation of the two languages without a change in base language (e.g. when a bilingual goes from a bilingual to a monolingual mode but stays in the same base language). Since these two factors are always present, it is crucial to state both when reporting the bilingual's language mode. Thus, for example, a French-English bilingual speaking French to a French monolingual is in a "French monolingual mode" (French is the base language and the other language, English, is deactivated as the mode is monolingual). The same bilingual speaking English to an English monolingual is in an "English monolingual mode". If this person meets another French-English bilingual and they choose to speak French together and code-switch into English from time to time, then both are in a "French bilingual mode". Of course, if for some reason the base language were to change (because of a change of topic, for example), then they would be in an

[3] As much of the psycholinguistics of bilingualism has concerned language perception (spoken or written) in the laboratory, it is important to stress that depending on the stimuli presented (monolingual or bilingual), the task used, the laboratory setting and the instructions given, a bilingual listener in an experiment can be situated at any point along the language mode continuum but is usually at the bilingual end. We will come back to this in a later section.

"English bilingual mode", etc. Saying that a bilingual is in an English language mode leaves totally open whether the mode is monolingual or bilingual. It should be noted that the expressions "language set", "language context" and even "language mode" have been used in the literature to refer to the base language the bilingual is using (or listening to) but they do not tell us anything about the comparative level of activation of the bilingual's two languages (for use of such terminology see, for example, Caramazza, Yeni-Komshian, Zurif & Carbone, 1973; Elman, Diehl & Buchwald, 1977; Beauvillain & Grainger, 1987, etc.).

2 Factors that Influence Language Mode

Any number of factors can help position a bilingual speaker or listener at a particular point on the language mode continuum, that is, set the activation level of the bilingual's languages and language processing mechanisms. Among these we find the participant(s), that is the person(s) being spoken or listened to (this includes such factors as language proficiency, language mixing habits and attitudes, usual mode of interaction, kinship relation, socioeconomic status, etc.), the situation (physical location, presence of monolinguals, degree of formality and of intimacy), the form and content of the message being uttered or listened to (language used, topic, type of vocabulary needed, amount of mixed language), the function of the language act (to communicate information, to request something, to create a social distance between the speakers, to exclude someone, to take part in an experiment, etc.) and specific research factors (the aims of the study taking place [are they known or not?], the type and organization of the stimuli, the task used, etc.). Thus, a monolingual mode will arise when the interlocutor or the situation is monolingual and/or other factors require that only one language be spoken to the exclusion of the other. This is the case, for example, when a bilingual adult or child is speaking with, or listening to, a monolingual family member or friend, or when a bilingual aphasic is speaking to a monolingual examiner, etc. Of course, no physical interactant need be present for a bilingual to be in a monolingual mode. If a bilingual is reading a book written in a particular language, watching a TV program in just one language or, more experimentally, taking part in a study in which only one language is used and where there is absolutely no indication that the other language is needed (but see below for the very real difficulty of creating this situation), then the bilingual is probably in a monolingual mode. The same factors apply for any other position on the continuum. Thus, if two bilinguals who share the same languages, and who feel comfortable mixing languages, are interacting with one another, there is a fair chance that they will be in a bilingual mode. This will be reinforced if, for example, the topic being dealt with is one that cannot be covered without having recourse to the other language in the form of code-switches and borrowings. A bilingual mode will also arise when a bilingual child is interacting with a bilingual parent (or adult), when a bilingual is simply listening to a conversation which contains elements of the other language or, more experimentally, when the study concerns bilingualism, the stimuli come from both languages and the task asked of the participants requires processing in the two languages. As for intermediate positions on the continuum, they will be reached by different combinations of the above factors. If the bilingual's interlocutor is not very proficient in the other language (but still knows it a bit), if he or she does not like to mix languages, if the topic has to be covered in the base language but the other language is needed from time to time (e.g. in the case of a bilingual child speaking one language to a bilingual researcher about a topic usually talked