

# Does bilingualism hamper lexical access in speech production?

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## Abstract

In the present study, we tested the hypothesis that bilingualism may cause a linguistic disadvantage in lexical access even for bilinguals' first and dominant language. To this purpose, we conducted a picture naming experiment comparing the performance of monolinguals and highly-proficient, L1-dominant bilinguals. The results revealed that monolinguals name pictures faster than bilinguals, both when bilinguals perform picture naming in their first and dominant language and when they do so in their weaker second language. This is the first time it has been demonstrated that bilinguals show a naming disadvantage in their L1 in comparison to monolingual speakers. © 2007 Elsevier B.V. All rights reserved.

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## 1. Introduction

In recent years, ample evidence has been brought to bear on the cognitive advantages associated with speaking two languages from an early age (Bialystok, 1999, 2001; Bialystok, Craik, & Ruocco, 2006; Bialystok & Martin, 2004; Costa, Hernández, & Sebastián-Gallés, in press; Ransdell, Arecco, & Levy, 2001; see Bialystok, 2005, for an overview). Researchers generally agree that these stem from the need to keep apart two representational systems and use each one appropriately. Could, however, the co-existence of the two linguistic systems also result in some sort of processing disadvantage for bilingual speakers? Specifically, does bilingualism affect the ease with which lexical representations are retrieved from the lexicon during speech production? The present article aims at answering this question.

A review of the relevant literature seems to provide some evidence suggesting a bilingual disadvantage in lexical access in speech production. Kohnert, Hernandez, and Bates (1998) have shown that on the Boston Naming Test,

bilinguals scored below monolingual norms in both their languages (and this was later confirmed by Roberts, Garcia, Desrochers, & Hernandez (2002), who tested both bilinguals and monolinguals). In a verbal fluency task (generation of as many exemplars as possible of a given category), monolinguals outperformed bilinguals (at least clearly in the semantic categories), both when college-aged participants (Gollan, Montoya, & Werner, 2002) and healthy older adults (Rosselli et al., 2000) were tested. Also, bilinguals seem to experience more tip-of-the-tongue states (TOTs) than monolinguals (Gollan & Acenas, 2004, Gollan & Silverberg, 2001; but see Gollan & Brown, 2006, for a re-examination of the origin of TOTs). Perhaps the most relevant study for the present purposes is that conducted by Gollan, Montoya, Fennema-Notestine, and Morris (2005) (see also Mägiste, 1979), in which bilinguals were slower and less accurate in naming pictures in their dominant language than monolinguals. Interestingly, however, this difference between the two groups disappeared after several repetitions of the same stimuli.

Several explanations for the observed bilingual disadvantage have been put forward (see Gollan et al., 2005). First, this disadvantage may stem from a disguised word frequency effect (see Mägiste, 1979; Ransdell & Fischler,

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1987). Given that presumably bilingual speakers use their dominant language less often than monolingual speakers, it is conceivable that the frequency values of the corresponding lexical representations are lower for the former group of speakers. Accordingly, the differential frequency with which words are used in the dominant language may affect the respective availability of lexical items in monolingual and bilingual speakers, and such a difference in availability can be enough to give monolinguals a head start in retrieving lexical representations. Another explanation of the bilingual disadvantage argues that bilinguals could suffer from cross-language interference. The basic idea here is that words from the language not used for production in a given communicative act become nevertheless activated and compete for selection with the lexical representations of the language being used (e.g. Green, 1998; Hermans, Bongaerts, de Bot, & Schreuder, 1998; Lee & Williams, 2001; but see Costa, 2005; Costa, Colomé, Gómez, & Sebastian-Galles, 2003; Costa, Miozzo, & Caramazza, 1999; Finkbeiner, Gollan, & Caramazza, 2006, for a discussion of this cross-language competition).

Regardless of its specific origin, caution needs to be exercised when generalizing the observed bilingual disadvantage to other populations of bilingual speakers. This is because, in the studies reviewed above, bilingual speakers with switched dominance were tested. That is, for most of those individuals, their dominant language was not the first acquired language (L1). For instance, in Gollan et al.'s (2005) study, the dominant language of the participants did not correspond to their first acquired language (Spanish) but rather to a language that was acquired later (English acquired at the age of 3.5–4 years). As a consequence, the difference between the performance of English monolinguals and Spanish–English bilinguals in English (their dominant but second language) cannot be taken as a definitive proof of a bilingual disadvantage, and it is certainly difficult to attribute to a specific origin. In other words, one should put on hold the conclusion that lexical access in the first and dominant language of bilingual speakers is hampered by their bilingual status until the appropriate group of bilinguals is tested (see Ransdell & Fischler, 1987, for similar claims). The aim of the present study is to examine whether lexical access in the first and dominant language of bilingual speakers is less efficient than that of monolingual speakers.

Importantly, there are reasons to suspect that bilinguals in their dominant and first language might perform differently from switched-dominance bilinguals in their dominant but second language. First, the age of acquisition (AOA) values of words in the dominant language for switched-dominance bilinguals and for monolinguals may be different (for the robustness of AOA effects, see Gerhand & Barry, 1998; Izura & Ellis, 2002; Morrison & Ellis, 1995, 2000). In this context, these bilinguals speaking in their second language (L2) would be slower than monolinguals not because of an intrinsic bilingual disadvantage but rather because the AOA values of the words tested in the

experiment were different for the two groups (note that AOA effects hold even for groups of items acquired two years from one another; Izura & Ellis, 2002; see also Section 4). Second, switched-dominance bilinguals may use their two languages in different social and linguistic contexts. In other words, the use of some L1 and L2 items for these bilinguals is complementary rather than overlapping. Thus, switched-dominance bilinguals may not even be sure of the translation equivalents of the corresponding items in the other language, or, at least, they are likely to have more problems in retrieving items in language A than they use (almost) exclusively in language B.

In fact, there is only one study assessing whether bilinguals speaking in their first and dominant language show a disadvantage in comparison to monolinguals (Ransdell & Fischler, 1987). These authors compared English monolinguals with bilinguals whose dominant and first-acquired language was English on four tasks (list recognition, free recall, lexical decision and object naming). They found that bilinguals were slower than monolinguals in list recognition and lexical decision, but – importantly – there were no significant differences between the groups on free recall or object naming. Although these results are suggestive, we believe that they do not provide a conclusive answer to the question of whether bilinguals suffer a disadvantage in lexical retrieval. This is because the manner in which the pictures were presented and latencies recorded in this experiment was far from optimal. The pictures were presented in sets of 10 on a paper sheet, and responses were recorded for each paper sheet with a stop-watch. That is, there was no independent measure for each target picture but rather for the whole set of 10 pictures. This procedure may have introduced considerable noise in the measurement, reducing the chances of detecting an effect. This is especially problematic if we consider that in this experiment there was actually a relatively large numerical difference between monolinguals and bilinguals in the expected direction (45 ms), indicating that the experiment might simply not have had sufficient sensitivity to lead to significant results. Furthermore, the latencies for the lexical decision task in the same study, where the authors did find that bilinguals were slower than monolinguals, were collected on a trial-by-trial basis by means of a computer. Thus, it is likely that the sensitivity of the different data collection methods used for the two tasks resulted in the difference between monolinguals and bilinguals being significant in one (lexical decision) but not in the other (picture naming).

Given the considerations above, one may argue that the existing evidence is not conclusive regarding whether bilingualism exerts a negative effect on the retrieval of lexical items in the first and dominant language. That is, for all we know at present, efficiency of lexical retrieval in the first and dominant language of bilinguals may not be different to that of monolinguals. To assess this issue, we compared the performance of Spanish monolingual speakers (Group 1) to that of Spanish–Catalan bilinguals (Group 2) in a picture naming task. Crucially, the first and dominant lan-

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