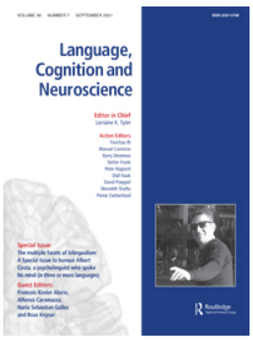

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INTRODUCTION

A psycholinguist who spoke his mouth: Introduction to the special issue on bilingualism in honour of Albert Costa

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ABSTRACT

Albert Costa was a dear friend and colleague who died young but accomplished much. We provide a brief sketch of his scientific contributions to the field of psycholinguistics and bilingualism. The articles included in the special issue are then presented along three research topics developed by Albert Costa in his own career: Lexical access in bilingualism, executive control in bilingualism, and judgement and decision making in a foreign language. The articles explore topics such as competition within and across words in unimodal or bimodal bilinguals, and its links to domain-general executive control, the reshaping of word form knowledge following second language learning, the stakes and methods involved in investigating accented speech, and the contrast between decision making in the native or second language. We hope this collection provides an up-to-date perspective on the rich field of bilingualism research, and a modest homage to our late friend and colleague.

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Lexical access; cognitive control; decision; bilingualism

Albert Costa (1970–2018) made important scientific contributions. He started investigating psycholinguistic processes in the mid 1990s. His first peer-reviewed contributions, some published in this very journal, were on phonological processes in monolingual speakers under the mentoring of Nuria Sebastián-Gallés (i.e. monolinguals studies: Costa & Sebastian-Gallés, 1998; Sebastian & Costa, 1997). He also explored comparisons of speakers of various languages with his "alter-acronyms" Anne Cutler and Alfonso Caramazza (i.e. cross linguistic studies: Costa et al., 1998, 1999). Soon enough, however, Albert would turn his attention to the issue of bilingualism where he made his most noted contributions in various seminal articles (e.g. Abutalebi et al., 2012; Costa et al., 2000, 2008, 2014).

Bilingualism is a broad topic with tremendous scientific perspectives, a topic that was very dear to Albert for many personal reasons. Albert was himself bilingual or, more properly, quadrilingual. He was born, raised and lived in Barcelona, where bilingualism is the norm. As he stated in his 2017 book, "*El cerebro bilingüe: La Neurociencia del lenguaje*", reprinted earlier this year in English paperback under the title "The bilingual brain and what it tells us about the science of language", Albert studied the phenomenon of bilingualism not just in order to understand how two languages co-exist, but also because "Bilingualism is a window into the study of human cognition" more generally (Costa, 2021).

Albert Costa's contributions to our understanding of bilingualism

Albert's contributions to our understanding of bilingualism are highly diverse in their theoretical questioning, methodological approaches, and populations of interest. They can be tentatively organised in three broad theoretical topics: Lexical access in bilingualism, executive control in bilingualism, and judgement and decision making in bilingualism (Figure 1). Broadly speaking, lexical access refers to the cognitive processes involved in determining what word to say and how to say it. Albert explored the extent to which words of the languages available to a speaker are in competition with one another, or whether using one language at a given point in time affects the subsequent use of another language. Executive control in bilingualism encompasses, broadly speaking, the issue of how managing two languages daily may influence the ability to

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Figure 1. Albert Costa in his own words. Word-clouds constructed with the words Albert used most often in the abstracts of the papers he co-authored, based on the record of his 200 contributions retrieved from the Scopus database. For clarity, the papers were loosely classified according to three topics (Hearst et al., 2020): lexical, control, decision. Only written words are collated, picturesque oral expressions and expletives were not included.

control our actions more generally, especially in non-verbal domains. Albert studied this link, or absence thereof, by comparing behavioural and neural recordings in the verbal and non-verbal domains across monolinguals and various populations of bilinguals. Finally, judgement and decision making in bilingualism refers to the hypothesis that reasoning is influenced by the language in which it is presented. For example, Albert showed that compared to their native tongue, when people use a second, foreign language, their moral choice is more utilitarian. Among his many academic service activities, Albert contributed to the launching and subsequent success of the International Workshop on Language Production, in 2004, and the Rovereto Workshop on Bilingualism, in 2005. A more detailed description of Albert's scientific contributions and trajectory can be found in Hernandez et al. (2019).

The content of the special issue

The special issue on bilingualism in honour of Albert Costa is organised around the topics that he studied in his own research. It contains two articles on the representation of word forms, the broad topic where Albert started his scientific career. Borragan et al. (this issue) explore how a new repertoire of orthotactic regularities (i.e. the frequent co-occurrence of two or more letters) is acquired in the course of second language learning. The data show that the orthotactic regularities are indeed acquired and, more importantly, that the representation of orthotactic regularities in the native language are also affected along the way. These observations illustrate how the acquisition of a new language is not a simple additive plug-in phenomenon but contributes to a cognitive re-organization of linguistic representations (Costa 2017). Goldrick et al. (this issue) explore the all too pervasive challenges of second language pronunciation. They start with a detailed consideration of the theoretical challenges at stake when trying to understand the causes and processes underlying foreign accent in second language learners. This empirical research often requires fine-grained analysis of acoustic signals to discern the relevant phonetic features, typically generated through

Figure 2. Albert riding a bicycle in the streets of Nijmegen (The Netherlands) in the summer of 2018. Albert was attending the International Workshop of Language Production that he and a few others launched in 2004. That year the workshop was organised by the Max Planck Institute of Psycholinguistics, who also lent the bicycle. The slogan in the shop window, "All about living", says it all.

effortful, tedious, error-prone manual annotations. They also present a new method based on a recurrent neural network that allows the automatic analysis of voice-onset-times, a temporal dimension of primary interest across many languages.

The next two articles focus on lexical access in bilinguals. Emmorey et al. (this issue) et al. contrast two long-standing accounts of picture word interference phenomena. In one account, picture name and distractor word compete for selection (e.g. Roelofs, 2018). In the alternative response exclusion account (e.g. Dhooge & Hartsuiker, 2010; Mahon et al., 2007), the distractor word accesses a response buffer that must be emptied before the target picture name can be uttered. Emmorey et al. provide a novel perspective on the issue by considering bimodal bilinguals, that speak and sign. Because speech and signs do not occupy the same response buffer, no picture word interference is expected under the response exclusion hypothesis. This is what is observed in chronometric and electroencephalographic measures.

Tomoschuk et al. (this issue) also explore competition effects in picture word interference, by considering the litmus case of identical target and distractors within and across languages (i.e. translations; as in Costa et al., 1999). Tomoshuk et al report two naming experiments in which they controlled and manipulated previously overlooked aspects of the design, such as blocking vs. mixing response languages. Their results show that translation distractors produced a robust facilitatory (not inhibitory) effect in mixed language blocks. This strengthens the view that bilinguals can restrict word selection to one of their languages. Tomoshuk et al. discuss this and other possibly more challenging results in the context of hypotheses about language competition in bilinguals.

The next article, by Boned et al. (this issue), explores the links between lexical selection and domain-general executive control in bilingual speakers. If a domain general executive control is involved in word and language selection, its efficiency in verbal and non-verbal tasks might be related. Boned et al showed that

a semantic context effect linked to executive control was similar in the native and in a less proficient language. More importantly, perhaps, they demonstrate that measures of semantic context effects and of executive control in a non-verbal task were related across participants, thus contributing to the ongoing debate regarding the links between verbal and domain-general control.

The final article addresses an issue that is related to Albert's latest contributions. Caldwell-Harris and Ayçiçeği-Dinn (this issue) provide a brief and efficient review of recent research on how using a second language might affect reasoning, decision making, or emotional responses. They go on to test the "stunted intuitions account", whereby using a second language might prevent biased intuitions to contribute (negatively) to a decision process. They evaluate this in the domain of moral action, where Albert has made an important contribution (Costa et al., 2014). Caldwell-Harris and Ayçiçeği-Dinn use electrodermal monitoring to argue that while moral intuitions constrain ethically related action in a native language, the use of a foreign language avoids these intuitions thereby allowing people to accept more selfish actions.

The man behind the scientist

In closing, we come back to the man behind the scientist (Figure 2), which is only a manner of speaking because Albert was anything but hidden behind Costa. Albert's scientific achievements and his peculiar debating style inspired us when preparing this special issue. Albert would often sit at the back in conference rooms, not always paying full attention, it would seem, to the ongoing presentation. Yet, more often than not, he would come up with challenging questions targeting the key point of a rationale or a data set. When discussing science, Albert was a very challenging player, with his unique mix of boisterous scholarship, cunning debating skills, and roguish ignorance of technical details.

In closing, we wish we could find an adjective or two to describe Albert. For most things of science and life, Albert was very *smart* but enjoyed playing very *dumb*. With theories and ideas, he could be very *precise* but be suddenly very *dismissive* of all that fuss. With his peers and students, he was very *thoughtful* but at times very *difficult*. At the end of a long conference day, Albert could be very, very *funny* but, at times, well … very *embarrassing*. It is indeed hard to find an adjective that captures all of Albert's personality and contributions. An adverb seems more apt. For everything he did, Albert was always *very*.

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Author's note

Author order was determined by how often each of us was told by Albert that we were wrong or confused; we do not remember if we settled on an ascending or descending ranking.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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