Universitat de Girona

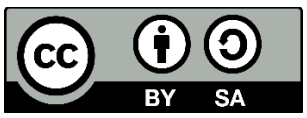
oberta

Propuestas en fonética experimental: enfoques metodológicos y nuevas tecnologías

Editores: Beatriz Blecua, Jordi Cicres, Marina Espejel y María J. Machuca.

Propuestas en fonética experimental: enfoques metodológicos y nuevas tecnologías

Beatriz Blecua
Jordi Cicres
Marina Espejel
María J. Machuca
(editores)



Edita: Universitat de Girona-Servei de Publicacions

ISBN: 978 84 8458 590 9

Girona, Marzo de 2022

Índice

INVESTIGATING THE ROLE OF COGNATE STATUS IN L2 PRODUCTION AND PERCEPTION

Celia Gorba[1], Susana Cortés[2], Juli Cebrian[1], Núria Gavaldà[3]

[1]Universitat Autònoma de Barcelona, [2]Universitat de les Illes Balears, [3]Universidad Internacional de La Rioja
celia.gorba@uab.cat, susana.cortes@uib.cat, juli.cebrian@uab.cat, nuria.gavalda@unir.net

ABSTRACT

This paper presents the results of two exploratory studies on the effect of cognate status on the perception and production of L2 sounds. Previous studies show that cognate words are more likely to be mispronounced by L2 speakers than non-cognates, but whether the influence of the L1 is modulated by L2 experience is unclear. In addition, few studies have explored the presence of cognate effects (CE) in perception. A first study involving Spanish/Catalan learners of English of different levels of proficiency found evidence of CE in perception more evident with the more advanced learners. However, no CE were found in production, possibly due to the nature of the production task. A second study failed to replicate CE in perception but found more evidence of CE in production with a less controlled task. The discrepant results are discussed in terms of the role of proficiency, metalinguistic knowledge, word frequency and task characteristics.

Keywords: cognates, production, perception, second language speech

1. INTRODUCTION

Cognate words are words that share semantic, phonological and orthographic properties in two languages, such as the Spanish words *estación*, *pétalo* and *hábito* and the English words *station*, *petal* and *habit*, respectively. The study of how cognate words are processed and produced by bilingual speakers can shed light on the relationship between the phonological systems of a bilingual speaker's two languages. This is so because when bilingual speakers use one of their languages, the lexicon of their language-not-in-use continues to be accessed (Costa, 2006). In particular, when words are cognates in the speakers' L1 and L2, the word in the language-not-in-use may affect pronunciation and lexical decision accuracy.

The effects of cognate status can be both beneficial and detrimental. On the one hand, a greater level of L1 activation takes place when processing L2 cognate words, which leads to faster vocabulary learning and access to lexical meaning (Tessel et al., 2018). On the other hand, the similarity in the form of these words has been reported to have a detrimental effect on pronunciation accuracy as cognate words tend to show a greater influence from the L1 during L2 production. For example, Spanish-dominant Spanish-Catalan bilinguals have been found to produce Catalan /ɔ/ and /ɛ/ (not found in Spanish) as Spanish /o/ and /e/ more often with cognate than with non-cognate words (Amengual, 2016; Mora & Nadeu, 2012). Similarly, Spanish/English bilinguals tend to produce stop VOT less accurately in their less dominant language in cognates (Goldrick, Runnqvist & Costa, 2014; Flege & Munro, 1994).

Regarding the relationship between L2 proficiency levels and cognate effects in production, studies show inconsistent results. While some previous research shows no clear relationship (Amengual, 2012), others suggest that cognate effects decrease as proficiency increases (Kroll et al., 2002; Jacobs et al., 2016). Finally, no studies have analysed cognate effects in purely perceptual tasks (cf. Tessel et al., 2018, which is an EEG study). Therefore, the goal of this paper is to explore further the relationship between cognate words and accuracy in production as well as the possible effect of cognate status in the perception of L2 sounds.

2. STUDY 1

In this first study, the perception and production of a set of English sounds in cognate and non-cognate words by speakers with different proficiency levels in L2 English was assessed.

2.1. Methodology

2.1.1. Stimuli

The target sounds in this study involved the English consonants /v, p, b, ɹ/. The segments examined differed phonetically or phonologically in the L1 and L2, as described in Table 1. The target sounds appeared in words that are cognates in English and Spanish/Catalan and words that are not. A trained bilingual English-Catalan speaker produced two versions of each target word: L1 (Spanish)-accented versions and native-like (English) pronunciations of the target words. The L1-accented versions involved [b] for target /v/, unaspirated /p/, spirantised /b/ and [r] for target /ɹ/.

Phonological differences	/v/	An En. phoneme that does not exist in Sp.	C: video NC: viewer
Phonetic differences	/p/ /b/	+VOT in En., 0 VOT in Sp. Spirantisation in Sp. /b/> [ß]/V_V	C: petal NC: pillow C: debate NC: above
Control	/ɹ/	Obvious difference between Sp. /r/ and En. /ɹ/	C: radio NC: runner

Table 1: Phonological variables with examples. (Sp. = Spanish, En. = English, C = cognate, NC = non-cognate)

2.1.2. Participants and tasks

A total of 26 L1 Spanish-Catalan L2 English speakers and 7 native English speakers participated in the study. The L2 English speakers were divided into three groups according to their proficiency level: intermediate, advanced and proficient. The intermediate group was made up of 7 2nd-year English Studies students who had taken a 6-credit course in English phonetics and phonology, the advanced group consisted of 10 4th-year students of the same degree who had taken 18 credits in English phonetics and phonology, and participants in the proficient group were faculty members in an English Department. Participants performed a forced choice goodness task in which listeners were presented with two versions of the same word and had to indicate whether the first or second word was clearly a more English-like pronunciation, or if they were equally fine. Thus, trials differed in terms of the word combination presented: accented + native, native + accented, or native + native words. Half the trials involved cognate words shared by English and Spanish and Catalan (e.g., *video*, *panic*, *debate* and *robot*), and the other half were non-cognate words. The tasks were created and administered using Praat (Boersma & Weenink, 2016). A subset of the participants, the group of advanced learners, also completed a picture naming task in which they produced a number of words, including cognate and non-cognate L1 (Spanish) and L2 words containing initial stops and /v/.

2.2. Results of Study 1

Regarding the perception task, the percentage of correct responses was calculated for each group and each segment. The results are given in Figure 1 and 2. Participants tended to be more successful at identifying the accented word with non-cognate words than with cognate words, illustrating a cognate effect on L2 perception. Statistical analyses on the percentage of correct responses for each segment yielded a significant difference between cognates and non-cognates for /v/, /b/ and /p/ [/v/_ $t(32) = -3.15$; $p = .003$; /b/ $t(32) = -2.43$; $p = .020$; /p/: $t(32) = -4.73$; $p = .000$]. As for /ɹ/, which acted as a control variable predicted to be easily identified when mispronounced, no cognate effect was found [$t(32) = 1.99$; $p = .055$].

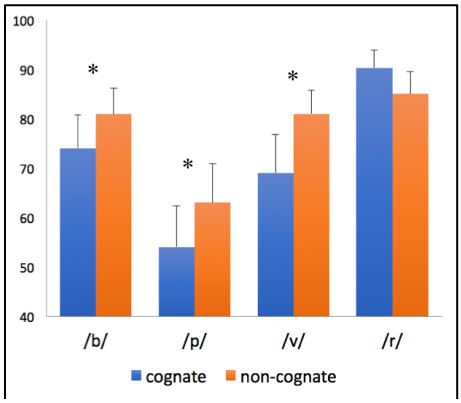


Figure 1: Perception task results. Percentage of accurate responses per segment.

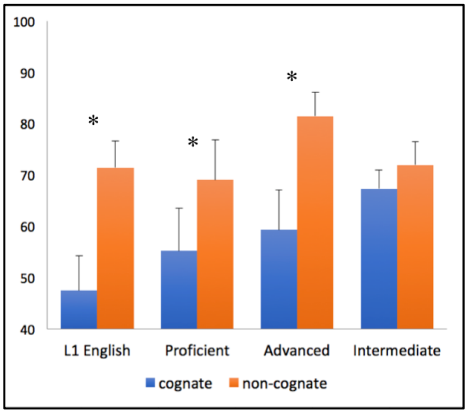


Figure 2: Perception task results. Percentage of accurate responses responses per group (accented + native combinations).

When comparing groups (see Figure 2), cognate effects were found for the advanced and proficient groups, and even for the native speaker group. That is, these groups displayed a higher percentage of correct responses in non-cognates than in cognates [advanced: $p = .000$; proficient: $p = .012$; L1 English: $p = .003$]. Therefore, cognate status seems to have a negative effect on the ability to detect mispronunciations in the L2. This effect appears to increase with L2 proficiency and is found even for native English speakers who have lived in a Spanish-Catalan environment for a long while. This is in contrast with previous findings that showed greater effects with lower proficiency learners (Kroll et al., 2002; Jacobs et al., 2016). The cognate effect found in native speakers of English could be explained by the fact that their knowledge of Spanish may have affected the perception of their L1. Alternatively, having exposure to Spanish/Catalan-accented English may have resulted in greater tolerance toward typical Spanish mispronunciations.

The production data was analysed acoustically (VOT duration for initial voiceless stops) and impressionistically (accuracy of /v/ production). Speakers tended to produce L1 and L2 initial stops with relatively target-like values in both languages, regardless of cognate status. In addition, speakers showed an overall accurate production of English /v/. This lack of cognate effects does not replicate previous findings (Amengual, 2012; Flege & Munro, 1994), and may be accounted for by the type of production task and the metalinguistic knowledge on the part of the advanced learners. First, this group of participants (4th-year English majors who had completed three courses on English phonetics and pronunciation) was metalinguistically aware of differences between the L1 and the L2. Second, the production of isolated words, and the inclusion of both L1 and L2 words, may have favoured a careful pronunciation of English sounds, particularly those known to be challenging for Spanish learners of English. Thus, a further study, Study 2, was designed to examine further possible cognate effects in perception and to evaluate production by means of a less controlled task.

3. STUDY 2

An exploratory follow-up perception and production study was carried out in order to refine the testing of specific segments in cognates and non-cognates by a group of advanced learners of English, which was comparable to the advanced group in Study 1 (found to show cognate effects in perception). In this second study, an attempt was made to elicit production with a task that allowed for less attention to form.

3.1. Methodology

3.1.1. Stimuli

The variables involved in this second study were the same as in study 1: (/p/, /b/, /v/ and /r/), with the addition of a further control variable, which was the production or omission of an epenthetic vowel before a consonant cluster beginning with /s/. A trained phonetician, who had a native-like command of both English and Spanish, produced both the English native-like productions and the Spanish accented productions. A native speaker of English listened to all the stimuli and detected correct and accented pronunciations in all instances.

2.1.2. Participants and tasks

Twelve advanced learners of English who had taken 18 credits in English phonetics and pronunciation have completed the study, which is still in progress. Participants performed both a perception and a production test. The perception test consisted in a forced choice goodness task with the new stimuli where listeners had to choose which pronunciation of a given word, the first or the second, sounded more accurate and English-like. In this case, there was no "equally good" option, but participants indicated for each trial how confident they were about their response. The production task consisted of reading a story that contained a number of words with the phonological variables under study, including some of the words in the perception test. The story reading was especially designed for this study in order to avoid the greater attention to form derived from the isolated word production in Study 1.

3.2. Results of Study 2

Preliminary results of the perceptual task reveal that performance was at ceiling for a number of individuals (83-100% accuracy), yielding a less clear pattern of overall cognate effects. This outcome runs counter to the results obtained for the advanced learners in Study 1. This may be due to methodological differences between the tasks, and the effect of metalinguistic knowledge, as discussed below.

Descriptive results for production show variation depending on the type of variable: speakers show no cognate effect on /v/ production, while they do with /p/ and /b/. On the one hand, overall results on /p/ VOT duration show that non-cognates tend to be produced with longer – i.e., more English-like – VOT values than non-cognates, although cognate effects seem to vary depending on the speaker, since 5 speakers show cognate effects whereas 7 do not.

Moreover, the cognate effect is more evident with high frequency words, such as 'pizza', which tend to be produced with more Spanish-like VOT values than a less frequent word like 'panda'. Hence, further data are needed to explore the role of word frequency on cognate effects. On the other hand, regarding /b/, the analysis of the intensity difference between /b/ and the following vowel (a greater difference indicates a more stop-like production) show a slight cognate effect, since the intensity ratio is slightly lower – more approximant-like – with cognate words than with non-cognates. A closer inspection of individual differences reveals that cognate effects also vary depending on the speaker, since 7 speakers show cognate effects whereas 5 do not.

5. GENERAL DISCUSSION AND CONCLUSIONS

The results of the first study show that participants were more accurate at identifying the accented word in non-cognate words than with cognate words, which indicates an overall cognate effect on L2 perception. These results provide evidence of cognate effects in perception, which complements similar outcomes regarding production and supports previous findings about the activation of the lexicon(s) of the languages-not-in-use in multilingual speakers (Costa, 2006). Further, the comparisons between groups in the first study show proficiency effects in perception, since cognate effects were found in more advanced learners, proficient learners, and even in native speakers who are living in a Spanish-Catalan environment. These results contrast with previous findings that suggest that cognate effects decrease with proficiency (Kroll et al., 2012; Jacobs et al., 2016). Besides, a closer inspection of individual segments reveal that the percentage of accurate responses was lower for /p/ than for /v/, which might indicate that L2 speakers may be worse at detecting accentedness at the phonetic level than at the phonological level.

Results of the second study show ceiling effects in perception and greater individual variation in production, resulting in a less clear pattern of overall cognate effects. Several factors may account for this difference. On the one hand, the advanced learners in Study 2 were undergraduate students who had been selected for their high mark in the oral exam of an oral skills course. This may imply a greater and more recent metalinguistic knowledge than the most advanced groups in Study 1. On the other hand, methodological differences in the perception task may also account for the discrepant results. In Study 2 participants were forced to choose which of two words sounded more native-like. In contrast, Study 1 involved the possibility of both words being native-like, so listeners did not know that one option was necessarily more native-like.

In terms of production, results from the two studies reveal no cognate effects with /v/. Speakers were overall accurate in the production of this variable regardless of cognate status. The type of task does not seem to have an effect, since both the isolated words in Study 1 and the words in context in Study 2 show a similar lack of cognate effects for this variable. On the other hand, the production of /p/ revealed no cognate effects in Study 1, since speakers tended to produce English initial stops with target-like values regardless of cognate status. This may be explained by the greater attention-to-form allowed in the production of words in isolation. In contrast, in Study 2 there was a general tendency for cognates to have shorter VOT durations than non-cognates, in line with previous studies (Amengual, 2012; Flege & Munro, 1994). Thus, a more naturalistic task seemed to favour cognate effects in this case. Yet, cognate effects may be affected by word frequency, with greater L1 influence with more frequent words. Future studies should explore this issue further. As regards the results for /b/, this variable also showed a general cognate effect, since intensity ratios were slightly lower (which indicates more spirant-like realisations) in cognates words than in non-cognates, although more data and inferential tests are needed to confirm this tendency. Finally, the results obtained so far seem to indicate that cognate effects may be more evident in phonetic traits such as /p/ and /b/ that do not involve a phonological difference, whereas, at least in these more metalinguistically-aware participants, cognate effects are not present in a trait that has phonological status such as /v/. Further data on phonetic and phonological variables, with a larger sample and different proficiency levels are necessary to evaluate and confirm these results.

This research was supported by research grants FFI2017-88016-P from the Spanish Ministry of Economy and Competitiveness, and by the research group Grant 2017SGR34 from the Catalan Government.

6. REFERENCES

Amengual, M. (2012). Interlingual influence in bilingual speech: Cognate status effect in a continuum of bilingualism. *Bilingualism*, *15(3)*, 517–530.

Amengual, M. (2016). Cross-linguistic influence in the bilingual mental lexicon: Evidence of cognate effects in the phonetic production and processing of a vowel contrast. *Frontiers in Psychology*, Apr;7:617.

Boersma, P., & Weenink, D. (2016). Praat: *Doing phonetics by computer* (version 5.3.56) [computer program].
Costa, A. (2006). Speech Production in Bilinguals (Chapter 8). *The Handbook of Bilingualism*, 201–223.
Flege, J.E., & Munro, M.J. (1994). The word unit in second language speech. *Studies in Second Language Acquisition*, 16, 381–411.
Goldrick, M., Runnqvist, E., & Costa, A. (2014). Language switching makes pronunciation less native-like. *Psychological Science,* 25*,* 1031-1036
Jacobs, A., Fricke, M., and Kroll, J. (2016). Cross-language activation begins during speech planning and extends into second language speech*. Language Learning*, 66, 324–353.
Kroll, J.F., Dussias, P.E., Bogulski, C.A., & Valdes-Kroff, J. (2012). Juggling two languages in one mind: What bilinguals tell us about language processing and its consequences for cognition. In B. Ross (Ed.), *The Psychology of Learning and Motivation,* Volume 56 (pp. 229-262). San Diego: Academic Press.
Mora, J.C., & Nadeu, M. (2014). L2 effects on the perception and production of a native vowel contrast in early bilinguals. *International Journal of Bilingualism,* 16(4), 484-500*.*
Tessel, C.A., Levy, E. S., Gitterman, M., & Shafer, V. L. (2018). Neurophysiological indices of the effect of cognates on vowel perception in late Spanish-English bilinguals. *Journal of Phonetics*, 68, 117–137.