

# Experimental test of a hypothesized diachronic change in Basque accentuation

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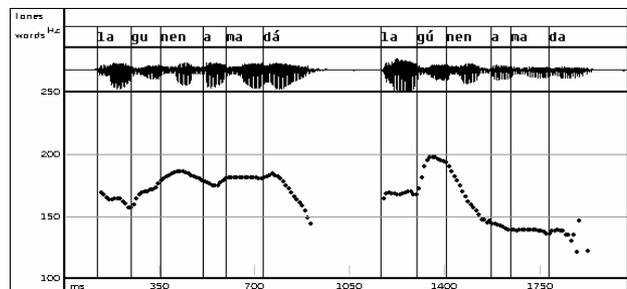
## ABSTRACT

In the central and western Basque-speaking regions there are two main accentual types: In the Northern Bizkaian area we find a pitch-accent system with demarcative phrase-initial rises and uniformly falling (H\*L) accents, on the last syllable of the phrase in the unmarked case. In the rest of the area the general rule is postinitial accent. This study tests the hypothesis, advanced in previous work on this topic, that one of the ways postinitial accent has historically developed is through the reinterpretation of phrase-initial boundary rises as accents, possibly under the influence of Spanish, a language in which non-phrase-final rises from valleys typically correlate with the location of stressed syllables. The results of our experiment confirm that this is a plausible historical scenario. Both native Basque speakers from other areas and, especially, Spanish L1/Basque L2 speakers show a strong tendency to perceive primary accentual prominence on the postinitial syllable in Northern Bizkaian speech, regardless of the actual position of the accent, except for initial accent.

## 1. INTRODUCTION

In the central and western Basque area we find two main accentual systems: the Northern Bizkaian pitch accent system and the central system with postinitial accent (together with some other, geographically more restricted systems of accentuation). In the Northern Bizkaian Basque (NBB) area we find a prosodic system which in many important respects resembles that of Tokyo Japanese [1]. As in Japanese [2], phrases are demarcated by an initial rising configuration (%L H-), with the H- tone loosely associated with the second syllable of the phrase, and accented syllables bearing a falling contour H\*L [3], [4]. Also as in Japanese, there is a lexical contrast between accented and unaccented words [5]. A difference between the two languages is that in NBB phrases containing only unaccented words receive an accent on their final syllable in focus position and in isolation (named “derived” accent in [3]).

In the example on the left in Figure 1, *lagunen ama dá* ‘it is the friend’s (sg) mother’, all three words are lexically unaccented. There is a rise through the second syllable of the phrase and a steep fall on the last syllable *da*, which receives phrase-final “derived” accent. In the example on the right, *lagúnen ama da* ‘it is the friends’ (pl) mother’, on the other hand, the word *lagúnen*, like all plural forms, bears a lexical accent. Since the accented syllable is the second one, the initial rise (%LH-) is immediately followed by the accentual fall (H\*L). If the initial syllable were accented, phrase-initial rise and accentual fall would both be associated with the initial syllable.



**Figure 1.** Northern Bizkaian Basque F0 contours. In the first example, *lagunen ama dá* ‘it is the friend’s (sg) mother’, all words are lexically unaccented and there is a phrase-final “derived” accent. In the second example, *lagúnen ama da* ‘it is the friends’ (pl) mother’, the plural form *lagúnen* bears a lexical accent. In both examples there is a phrase-initial rise throughout the postinitial syllable.

The most widespread accentual system in central and western Basque dialects is rather different from what we have just described for NBB, however. In the most common system, there is no contrast between lexically accented and unaccented words. Instead, the accent generally falls on the second or postinitial syllable, except that there may be an exceptional class of items with initial accent. That is, the accent always falls on one of the first two syllables, most commonly on the second. Accents are typically realized as rising contours which are immediately followed by falls if the word is in phrase-final position.

A question that arises is what the historical connection between these two very different accentual systems could be, since there is indeed strong evidence that the two systems are historically related [6]. A hypothesis that has been put forward in [1], [6] is that the central system with postinitial accent developed, at least in some areas, through the reinterpretation of phrase-initial rises as indicating the position of the accent. This reinterpretation would have been triggered by contact with Spanish. Since in Spanish nonfinal abrupt rises from F0 minima or valleys are typically associated with lexically stressed syllables [7], [8] bilingual Spanish-dominant speakers might have perceived the rise on the second syllable that we see in both examples in Figure 1 as indicating accentual prominence, causing a thorough restructuring of the accentual system. In the examples in Figure 1, for instance, this reinterpretation would lead to neutralization. More generally, this reinterpretation would result in generalized postinitial accent in all cases, except in words which prior to the reanalysis had initial accent, for which there would be no change. Schematically, using / to indicate the position of a tonal rise, \ to indicate a tonal fall and acute accent marks to show accentual prominence, we would have the following development from NBB to the general Central Basque system:

NBB		Central Basque
/ó\ o o o	>	ó o o o (no change)
o /ó\ o o	>	o ó o o (no change)
o / o ó \ o	>	o ó o o
o / o o ó \	>	o ó o o

**Table 1.** Hypothesized diachronic shift of non-initial accents to the postinitial syllable by reinterpretation of phrase-initial tonal rises as accentual prominence.

Although in [6] a number of arguments are put forward for this hypothetical diachronic scenario, no hard evidence is provided for the claim that Spanish-dominant bilingual speakers actually perceive syllables bearing an initial rise in NBB as being accented. This claim, on which the hypothesized historical change crucially relies, remains to be substantiated.

The purpose of this study is precisely to test this hypothesized diachronic change experimentally. The experimental hypothesis is that Spanish-dominant bilingual speakers as well as native Basque speakers of dialects that have undergone the historical change will tend to perceive accentual prominence on the second syllable of words in isolation in NBB regardless of the actual position of the accent (H\*L), except for words with initial accent. That is, these speakers will correctly perceive the location of the accent on words with initial or postinitial accent, but will tend to also perceive postinitial accent on all words accented beyond the postinitial.

## 2. METHODS

### 2.1. MATERIALS

To test the perception of word-accent we chose 20 words in the Gernika-area variety of NBB illustrating four accentual patterns: 5 words with initial accent, 5 words with postinitial accent, 5 words with lexical accent on the third or fourth syllable (nonfinal) and 5 words with final accent (lexically unaccented words bearing a “derived” accent).

a) Initial accent: *básuetara* ‘to the glasses’, *árrentzako* ‘for the worms’, *béstietatik* ‘from the others’, *txistuetaatik* ‘from the flutes’, *lékuetaatik* ‘from the places’.

b) Postinitial accent: *lagúntzako* ‘for the friends’, *eskólara* ‘to the school’, *basérrittarra* ‘the farmer’, *mendíxetatik* ‘from the mountains’, *gixonéntzako* ‘for the men’.

c) Other lexical accent (beyond second syllable): *txistularídxentzako* ‘for the flutists’, *Gernikétik* ‘from Gernika’, *Bermiokóantzako* ‘for the ones of Bermeo’, *alargúneri* ‘to the widows’, *iturrikóak* ‘the ones of the fountain’.

d) (Phrase-)final “derived” accent: *alargunerí* ‘to the widow’, *alabiená* ‘the one of the daughter’, *txistularídxé* ‘the flutist’, *gixonarí* ‘to the man’, *txistularídxentzakó* ‘for the flutist’.

**Table 2.** Recorded words for listening test. (Basque orthography: *x* = voiceless prepalatal fricative, *tx* = voiceless prepalatal affricate, *dx* = voiced prepalatal fricative, *tz* = voiceless alveolar affricate, *tt* = voiceless palatal stop. Acute accent marks indicate accented syllable.)

The 20 words in the list above were recorded by a female Basque speaker from the Gernika area. We verified that the recorded words had been produced with the expected accentual patterns both auditorily and by inspection of F0 contours. A tape was then made with the 20 items in an arbitrary order. A transcript with all 20 words in the order in which they appear on the tape was also made. This transcript was given to the participants in the listening test.

### 2.2. LISTENING TEST

Participants in this experiment were asked to listen to the tape described above and were given the transcript with the words written in conventional orthography and without any indication of stress or accent. They were told that the tape contained the list of Basque words on their transcript pronounced by a speaker of a Bizkaian variety. They were asked to write an acute accent mark on those vowels that they heard as stressed or prominent. This task did not seem to require any special training, since acute accent marks are used for this purpose in standard Spanish orthography, in which all subjects were expected to be proficient.

Participants were instructed to indicate degree of prominence with a number above the accent mark, in case they heard prominence on more than one syllable per word. Participants heard each of the stimuli at least three times, more if needed.

41 volunteers participated in this experiment. Subjects were selected according to linguistic background: Group I: NBB speakers, all from the Gernika area; that is, speakers of the same dialectal variety as the speaker who produced the audio tape (10 subjects). Group II: Basque speakers from other central/western dialectal areas, such as Southern Bizkaia and Gipuzkoa (15 subjects). Group III: Spanish L1/Basque L2 speakers (i.e. native Spanish speakers who have learned Basque as a second language), all from Vitoria-Gasteiz (16 subjects). All subjects were students or faculty, except for 3 in Group II, who were young professionals.

### 2.3. EXPERIMENTAL HYPOTHESIS

Regarding the test items, our hypothesis is that for words in (a) and (b) in Table 2 all three groups of speakers will respond in a similar manner, since those words have both a tonal rise and a fall phonologically associated with the accented syllable. For words in (c) and (d), listeners in Groups II and III will show a tendency to mark the accent on the postinitial syllable, where the phrase-initial rise takes place.

## 3. RESULTS

As shown in Table 3, there are no major differences between the three groups of listeners regarding the perception of words with initial accent. For all three groups over 85% of the answers are correct. We counted an answer as correct if the initial syllable was marked as either the only accented syllable of the word or as the syllable with primary prominence if more than one level of prominence was indicated.

	Initial (correct)	Postinitial	Other
I. NBB	44/50 (88%)	4/50 (8%)	2/50 (2%)
II. Other Bq native	73/75 (97.3%)	2/75 (2.6%)	0
III. SpL1 / BqL2	70/80 (87.5%)	9/80 (11.25%)	1/80 (1.25%)

**Table 3.** Perception of words with initial accent. Syllable marked as having either the only or the primary accent of the word.

The results in Table 4, for words with postinitial accent, show that for these words as well all three groups performed in a similar fashion, correctly identifying the postinitial syllable as accented (primary or only accent) in over 80% of the cases.

	Postinitial (correct)	Other
NBB	40/50 (80%)	10/50 (20%)
Other Bq native	65/75 (86.6%)	10/75 (13.3%)
SpL1/BqL2	73/80 (91.25%)	7/80 (8.75%)

**Table 4.** Perception of words with postinitial accent. Syllable marked as having either the only or the primary accent of the word.

Table 5 shows that the results for words with lexical accent on a syllable other than the initial or the postinitial (third and fourth syllables) are quite different from those above. First of all, even though for NBB speakers there is far from perfect identification of the accented syllable, the percentage of correct answers is much lower for the other two groups of speakers (only 12% and 10% of correct answers, respectively, for Basque speakers from outside of the NBB area and for second-language speakers). Furthermore, if we consider incorrect answers, we notice that whereas NBB speakers incorrectly identify the postinitial syllable as bearing the main or only prominence of the word in 22% of the cases, this percentage jumps above 77% for the other two groups of speakers, which show virtually identical results.

	Third/fourth (correct)	Postinitial	Other
I. NBB	31/50 (62%)	11/50 (22%)	8/50 (16%)
II. Other Bq native	9/75 (12%)	58/75 (77.3%)	8/75 (10.6%)
III. SpL1 / BqL2	8/80 (10%)	62/80 (77.5%)	10/80 (12.5%)

**Table 5.** Perception of words with lexical accent on a syllable beyond the second. Syllable marked as having either the only or the primary accent of the word.

As just mentioned, the percentage of correct identifications by NBB listeners is relatively low (62%), although much higher than that for the other groups of listeners. We believe that if the task had been to simply identify the word and its meaning (e.g. whether the stimulus is ‘to the widow’, *alarguneri*, or ‘to the widows’, *alargūneri*) scores would have been perfect or near-perfect for listeners with this contrast in their native dialect (cf. [9], although see [10] for a test of this type in Japanese dialects). Accurately pinpointing the accented syllable is clearly a more difficult task.

Finally, in the case of lexically-unaccented words, which bear phrase-final accent in the stimuli (Table 6), noticeable differences are found among all three groups regarding both the percentage of correct identification of the accented syllable and the percentage of perceived accent on the postinitial syllable. For this group of words, whereas NBB speakers correctly identified the location of the accent in 82% of the instances, native Basque speakers from other dialectal backgrounds had less than 60% of correct identifications and this percentage decreases to just over 25% for non-native speakers. Conversely, among the

incorrect answers, we find only 6% cases of perception of postinitial accent for NBB speakers, but second-language speakers identified the postinitial syllable as bearing main prominence in a full 65% of the cases, other Basque speakers falling somewhere in between but also perceiving main prominence on the postinitial in almost all cases where they did not correctly identify the accented syllable.

	Final (correct)	Postinitial	Other
I. NBB	41/50 (82%)	3/50 (6%)	6/50 (12%)
II. Other Bq native	44/75 (58.6%)	28/75 (37.3%)	3/75 (4%)
III. SpL1 / BqL2	21/80 (26.25%)	52/80 (65%)	7/80 (8.75%)

**Table 6.** Perception of words with “derived” final accent. Syllable marked as having either the only or the primary accent of the word.

Summarizing, the most important result for our hypothesis is that, in the case of SpL1/BqL2 speakers, the primary or only prominence is perceived on the postinitial syllable in the great majority of cases, except for words with prominence on the initial syllable. That is, these subjects tend to hear the second syllable as prominent in words where the accent does not fall on the initial syllable, coinciding with the presence of the NBB phrase-initial rise. Native Basque speakers from outside of the NBB showed an equally strong tendency to perceive the accent on the postinitial in words with nonfinal accent on the third or the fourth syllable. However, they correctly identified final accent much more frequently than L2 speakers (while still incorrectly perceiving postinitial accent in more than a third of the examples with final accent).

#### 4. CONCLUSIONS

The results of our experiment offer crucial and strong support for the sound change described in Table 1. As speculated in [6], Spanish-dominant bilingual speakers overwhelmingly tend to perceive accentual prominence on the syllable associated with a tonal rise (%L H-) instead of perceiving it on the syllable with a falling (H\*L) pitch accent in NBB words where rise and fall are associated with different syllables. These subjects thus tend to perceive postinitial accent on words accented on any syllable beyond the second. Clearly this perception can lead to a reanalyzed system where all words have postinitial accent, except for those with initial accent, thus neutralizing a number of accentual contrasts in the original system. In a sense, we have been able to replicate this postulated historical change experimentally.

It is important to notice that the perception of accentual prominence on the second syllable does not result from a perceptual imposition of Spanish accentual patterns on the Basque stimuli. As is well-known, Spanish words are stressed on one of their three last syllables, most commonly on the final or on the penult. The perceptual transformation (and diachronic reanalysis) of, for instance, both

*txistularidxentzako* ‘for the flutists’ and *txistularidxentzakó* ‘for the flutist’ into *txistularidxentzako* results in a pattern that is completely unattested in Spanish. As remarked in [6], the relevant fact for the reanalysis is that in the reanalyzed system tonal gestures have the same correlation with prosodic prominence as in Spanish (i.e. nonfinal tonal rises are aligned with lexically prominent syllables).

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