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# On the phonemic status of nasalized /h̃/ in Modern Zuberoan Basque

<https://doi.org/10.1515/ling-2018-0024>

**Abstract:** Modern eastern Basque dialects have several conservative features, including the maintenance of historical /h/, which is lost in other dialects. Zuberoan, the easternmost dialect of Basque still spoken today, shows both this /h/ as well as a phonetically nasalized segment [h̃] which is a reflex of intervocalic \*n. In this paper I argue that these two segments contrast in Zuberoan. Evidence for the contrast comes from both a newly described process of assimilation of /h/ to /h̃/ in nasal environments which then serves as a basis of the analogical extension of the nasalized aspirate in a context where it cannot be phonologically derived, and from neighboring Mixean Low Navarrese where the nasalized [h̃] has no other obvious source. Since a contrast between oral and nasalized aspirates is rare crosslinguistically, the Zuberoan and Mixean sound patterns discussed here should be of interest to typologists and phonologists alike.

**Keywords:** laryngeals, nasalized aspirates, rhinoglottophilia, nasalization, Basque, Zuberoan

## 1 Introduction

More than half of the world's languages have a phoneme /h/, a voiceless aspirate, often classified as an approximant, glide or voiceless laryngeal.<sup>1</sup> In contrast, few languages if any have a clear contrast between /h/ and its nasalized counterpart /h̃/, though, as argued by Walker and Pullum (1999), [nasal] must be a possible phonological feature of glottals given that /h̃/ has been

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<sup>1</sup> 88 % of the languages in the UPSID database (279/317) have /h/ (Maddieson 1984). For a detailed discussion of the frequency of /h/ in contrast to voiceless sonorants, see Blevins (2018). Classification of this sound as an approximant or glide is based on the absence of significant constriction and/or air pressure build-up in the supralaryngeal cavity (cf. the definition of [consonantal] in Halle and Clements 1983).

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described to trigger phonological nasal spreading. The phonological spread of nasalization triggered by / $\tilde{h}$ / requires this segment to be phonologically specified for nasality, yet an opposition between /h/ and / $\tilde{h}$ / is scarcely attested in the world's languages. Ohala (1975) suggested early on that cues for aspiration and nasality were similar, attempting to explain the absence of this contrast crosslinguistically in terms of perceptual similarity (see also Ohala 1990). Since then, at least two languages have been argued to have a contrast between oral and nasalized /h/: Kwangali, a Bantu language (Ladefoged and Maddieson 1996) and Seimat, an Austronesian language of the Admiralty Islands (Blust 1997, 1998). At least two other languages, Aguaruna, a Jivaroan language, and Arabela, a Zaparoan language, are analyzable with the oral vs. nasalized /h/ contrast, or with the nasalized aspirate viewed as a predictable allophone of a velar nasal consonant (Walker and Pullum 1999: 768–770; Durvasula 2009: 52–55). Given the typological rarity of a contrast between oral and nasalized /h/, any language showing a possible contrast between these two segment types should be of interest.

One language with a possible contrast of this kind is Zuberoan (Souletin) Basque, a modern Basque dialect spoken in the northeasternmost corner of the Basque Country. In this variety of Basque nasalized and non-nasalized aspirates exist, as shown by minimal pairs such as *ehe* 'wash water' vs. *ēhē* 'no' (Lafon 1958). Hualde (1993: 294) states the hypothesis clearly: "...our proposal is that Souletin has two aspirated phonemes: oral /h/ and nasal / $\tilde{h}$ /". While many adopt Hualde's analysis, an alternative, first proposed by Larrasquet (1932: 168), views nasalization of aspirates as allophonic, with nasalization spreading from adjacent nasalized vowels to /h/ (Michelena 2011b [1977]). The issue has not been seriously revisited in modern studies of Zuberoan phonology, and the central role of this paper is to fill this gap.<sup>2</sup>

In this paper, I begin with the basic observation of minimal and near-minimal pairs contrasting oral vs. nasal aspirates. In addition, I offer two different kinds of evidence for this as a contrast between oral vs. nasal aspirates, as opposed to allophonic nasalization of the aspirate in nasalized vowel contexts. The first piece of evidence is a newly identified analogical spread of the nasalized aspirate discussed in Section 2.2, and the second, offered in Section 2.3, is comparative dialect evidence where vowel nasalization does not appear to be a possible source for aspirate nasalization. In Section 2.1, I offer an overview of Basque dialect phonology, and of the Zuberoan phoneme inventory. Before turning to this, a brief summary of the diachronic phonology that has given rise

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<sup>2</sup> For a recent treatment of rhinoglottophilia in Basque historical phonology, including the evolution of nasalized aspirates, see Igartua (2015).

to the contrastive aspirates in earlier stages of Basque and in modern Zuberoan is presented. Throughout, transcriptions enclosed in square brackets make use of standard IPA symbols.<sup>3</sup> The IPA refers to /h/ as a “glottal fricative”; in this paper, I use the terms “aspirate” and “nasalized aspirate” to refer to these sounds, since intense fricative noise, of the kind associated with Basque sibilants, is typically weak or absent.

Proto-Basque, as reconstructed by Michelena (2011b [1977]: 171–172), has a contrast between intervocalic \*h, intervocalic \*n, and zero: \*zahar ‘old’, \*seni ‘boy’, \*gau ‘night’.<sup>4</sup> Intervocalic /h/ and /n/ are both attested in Aquitanian, the oldest attested Euskarian language (Gorrochategui 1984; Martínez-Areta 2013), with /h/ persisting into Michelena’s Common Basque (ca. 600 CE), and later lost in western varieties, but preserved in Zuberoan and other eastern dialects. Intervocalic \*n was also weakened. While many instances of Proto-Basque \*h have been maintained by the modern eastern dialects (compare Aquitanian (*Umme*)sahar to modern Basque zahar ‘old’), evidence for the reconstruction of intervocalic \*n can be found in Aquitanian attestations such as *Seni-* (in the names *Senicco*, *Seniponnis* and *Senitennis*, modern Basque *sehi*, *sei(n)* ‘boy, servant’), names of Basque origin with early introduction into Romance (cf. *Anuncibai*, formed by modern Basque *ahuntz* ‘goat’ and (*h*)*ibai* ‘river’) or old compounds that lost the phonological context that triggered the change (cf. *mingain* ‘tongue’, formed by the words *mihi* < \**bini* ‘tongue’ and *gain* < \**gane* ‘top’). Michelena (2011a [1950]: 8–9, 2011b [1977]: 171) proposes the sound change of \*VnV > ṼhṼ; by contrast, evidence from Zuberoan has led Hualde (1993), Igartua (2008, 2015) and Egurtzegi (2014) to formulate the weakening as \*VnV > ṼhV, giving rise to a nasalized aspirate phoneme.<sup>5</sup> In (1a) this development is shown for inherited vocabulary, where reconstructions are from Michelena (2011b [1977]; Arbelaiz 1978), and examples in (1b) show the same sound change in Latin loans.

<sup>3</sup> Phonetic nasalization of both /h̃/ and vowels is transcribed throughout, so as not to bias interpretation of the source of nasalization.

<sup>4</sup> Trask (1997) does not reconstruct \*h for Common Basque. Among problems for his account are the many attested cases of /h/ in Aquitanian, continued faithfully in Medieval Basque, Zuberoan and other northern dialects. For a critique of his proposal for a synchronic /h/ autosegment, see Igartua (2001) or Lakarra (2009); see also papers in Martínez-Areta (2013), which all assume \*h for Proto-Basque, and its continuation in Aquitanian, Medieval Basque and northern dialects.

<sup>5</sup> The weakening of a voiced nasal to /h/ may seem phonetically unnatural, but has been analyzed as a case of rhinoglottophilia, recognizing the similar acoustic/perceptual properties shared by nasalization and aspiration. See Igartua (2008, 2015) for general references, and for a detailed treatment of the Basque case.

## (1) \*n &gt; /h̃/ /V\_V

## (a) Inherited lexicon:

Zuberoan	IPA	Reconstruction	Gloss
<i>ahai</i>	/ãhãĩ/	* <i>anari</i>	'ram'
<i>ihi</i>	/ĩhĩ/	* <i>ini</i>	'rush, reed'
<i>ihes</i>	/ĩhēs̺/	* <i>enes</i>	'to escape, run away'
<i>sehi</i>	/s̺h̃h̃ĩ/	* <i>seni</i>	'servant' (Bizkaian Basque <i>sein</i> /s̺eĩn/ 'boy')
<i>mihi</i>	/mĩhĩ/	* <i>bini</i>	'tongue' (cf. <i>mingain</i> 'tip of the tongue')

## (b) Latin loanwords:

Zuberoan	IPA	Latin	Gloss
<i>uhue</i>	/ũhũē/	<i>honōre(m)</i>	'honor' (Standard Basque <i>ohore</i> )
<i>ahate</i>	/ãhãte/	<i>anãte(m)</i>	'duck'
<i>mahuka</i>	/mãhũka/	<i>manica,</i> * <i>manuca</i>	'sleeve'

Since the contrastive status of the synchronic nasalized aspirate in Zuberoan is the subject of this paper, we do not use this diachronic development as evidence for any aspect of the synchronic phonology. It is mentioned only to give the reader an overview of the sound patterns in earlier stages of Basque that are widely agreed to have given rise to the aspirate contrasts discussed in the remainder of this paper.

## 2 The Zuberoan /h/ vs./h̃/ contrast

### 2.1 Segmental contrasts in major Basque dialects

Major dialects of Basque at the end of the nineteenth century are illustrated in Figure 1. Zuberoan, the dialect of central interest in this study, is located at the far northeastern corner of the Basque speaking region, surrounded on its northeastern borders by Romance languages (Gascon and French), and in past centuries, by other dialects of Basque to the south and west, though now, these are regions dominated by Castilian.

Table 1 illustrates the segmental inventory of Standard Basque, and Table 2 illustrates the contrastive segments of Zuberoan as analyzed by Hualde (2003).

Zuberoan has a range of contrasts that are absent in Standard Basque (and the central and western varieties on which this standard is based), including: /h/

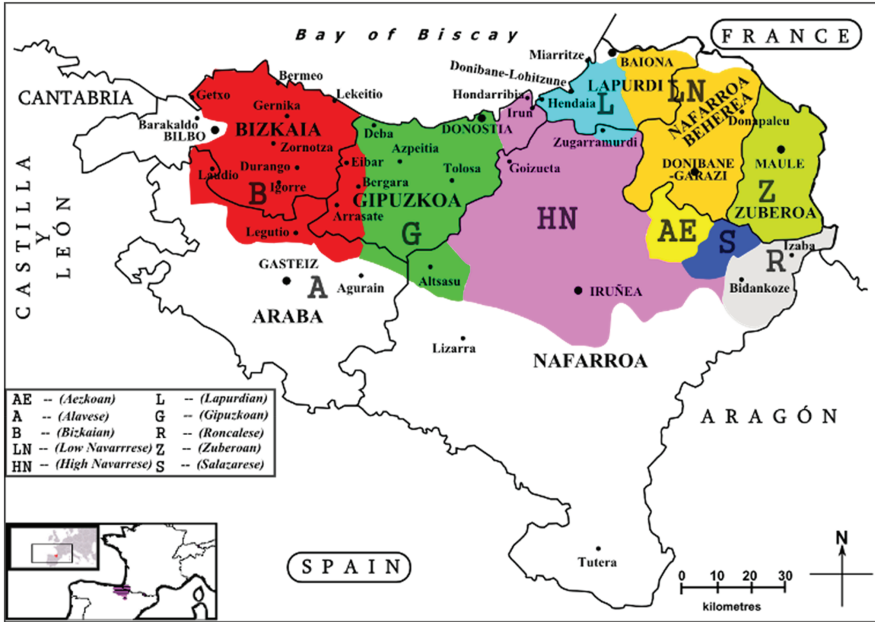


Figure 1: The historical dialectal division of Basque (Egurtzegi 2014).

Table 1: Segment inventory of Standard Basque (after Hualde 2003).

		labial		apical		laminal	predorsal		postdorsal
		bilabial	labio-dental	apico-dental	apico-alveolar		palato-alveolar	palatal	
stop	voiceless	p		t				c	k
	voiced	b		d				ɟ	g
	fricative		f		ʃ	ʃ̺	ʃ̺		x
	affricate				tʃ	tʃ̺	tʃ̺		
	nasal	m			n			ɲ	
	lateral				l			ʎ	
	tap				r				
	trill				r				
	front	central	back						
high	i		u						
mid	e		o						
low	a								

Table 2: Segment inventory of Zuberoan (after Hualde 2003; Egurtzegi 2014).

	laminal									
	labial		apical		(alveolar)		predorsal		laryngeal	
	bilabial	labio-dental	apico-dental	apico-alveolar	palato-alveolar	palatal	postdorsal	laryngeal		
<b>stop</b>	voiceless aspirated voiced	p p <sup>h</sup> b	t t <sup>h</sup> d			c c <sup>h</sup> ʃ	k k <sup>h</sup> g			
<b>Fricative</b>	voiceless voiced	f	s z	s z	ʃ					h/ħ
<b>affricate</b>	voiceless voiced		ʧ dʒ	ʧ	ʧ					
<b>nasal</b>										
<b>lateral</b>										
<b>tap</b>										
<b>trill</b>										
<b>glides</b>										
<b>high</b>	front		central	back						
<b>mid</b>	i/ĩ e	y/ỹ		u/ũ o						
<b>low</b>			a/ã							

vs. /h̃/; oral vs. nasalized vowels, and an /u/ vs. /y/ contrast.<sup>6</sup> While the latter two features, namely vowel nasalization and presence of a front rounded vowel, can arguably be attributed to Romance influence (Egurtzegi 2014, Egurtzegi 2017), the aspirate contrast under investigation here cannot be attributed to external influence, and, indeed, is typologically unusual, as noted earlier.

In Table 3, the presence (✓) or absence (X) of these three features is tabulated for selected dialects and earlier stages of Basque, following Michelena (2011b [1977]), Hualde (2003) and Egurtzegi (2013, 2014).

**Table 3:** Contrastive aspirates and nasalization in Basque, past and present.

	h	h̃	ṽ	y
Aquitanian	✓	X	X	X
Old Common Basque	✓	✓ <sup>a</sup>	X	X
Bizkaian	X	X	X	X
Gipuzkoan	X	X	X	X
High Navarrese	X	X	X	X
Roncalese	X	X	✓	X
Lapur dian	✓	X	X	X
Low Navarrese	✓	X	X	X
Mixean (LN)	✓	✓	X	✓
Zuberoan	✓	✓	✓	✓

<sup>a</sup>There is no evidence that contradicts this.

Today, /h/ is contrastive in the three northern dialects of the French territory, Lapurdian, Low Navarrese and Zuberoan (L, LN and Z in the map), while /h̃/ has been claimed to be contrastive only in Zuberoan. Nasalized vowels were present in Archaic Bizkaian and Roncalese, but today are found only in Zuberoan. Front rounded /y/ is found in Zuberoan and Mixean Low Navarrese.

Note that the earliest stages of Basque, represented here by Aquitanian, show intervocalic and word-initial /h/ vs. /n/ vs. zero, while later stages of the language appear to show a shift of intervocalic /n/ to nasalized /h̃/ or /h/, and western dialects show a loss of /h/ altogether. Some common lexical items illustrating dialect correspondences for historical initial and intervocalic /h/ and /n/ are provided in Table 4.

<sup>6</sup> Some spectrograms illustrating the /h/ vs. /h̃/ contrast can be found in Egurtzegi (2014).

**Table 4:** Dialect correspondences for Proto-Basque \*h and \*n.

Pre-Basque	Zuberoan	Low Navarrese	Western	Gloss
*#hV	[hari] [hil]	[hari] [hil]	[ari] [il]	'stone' 'dead'
*#nV	[naɣ,uʃi] [ni]	[naɣ,uʃi] [ni]	[naɣ,uʃi] [ni]	'chief' 'I' (1sg.abs)
*VhV	[ʃahar] [bihi]	[ʃahar] [bihi]	[ʃaar], [ʃar] [bii], [bi]	'old' 'grain'
*VnV	[ãhãrdi] [ĩhẽʃi]	[ahardi] [iheʃi]	[aardi] [ieʃi], [iɲeʃi]	'sow' 'to flee'

Throughout this paper, we use the voiceless symbols [h] and [h̥] for the two sounds in question, though in intervocalic contexts, both aspirates are typically voiced.

Though /h/ is phonemic in Zuberoan, Low Navarrese and Lapurdian, it has different lexical frequencies in these varieties, decreasing significantly as one moves from east to west. Zuberoan, the easternmost dialect, appears to represent the most conservative stage, where /h/ has the highest functional load. Loss of /h/ has moved areally from western varieties into Lapurdi, and is now complete on the Lapurdian coast, extending into Low Navarre.<sup>7</sup> In Zuberoan, however, /h/ has been preserved in most of its historic contexts. In sum, Zuberoan appears to be the only modern variety of Basque in which /h/ does not show any critical trace of recession, and, apart from one variety of Low Navarrese discussed in Section 2.3, it is also the only dialect that maintains the distinction between oral /h/ and nasalized intervocalic /h̃/ (from \*VnV).

## 2.2 New evidence for Zuberoan /h/ vs. /h̃/: Analogical extension of /h̃/

Hualde's (1993) proposal for an /h/ vs. /h̃/ contrast in Zuberoan is based on minimal and near-minimal pairs like those shown in (2).

<sup>7</sup> Bonaparte's (1991[1869]) dialect descriptions allow us to see that /h/ was already lost in coastal areas of Lapurdi, and was being lost in the eastern varieties of the Lapurdian dialect in the nineteenth century. The first context where /h/ was lost in Lapurdian is in post-sonorant position: compare Lapurdian *alaba* 'daughter', *alargun* 'widow', *eraztun* 'ring' vs. Zuberoan *alhaba*, *alhargun*, *erhaztun*.



## (2) Surface /h/ vs. /h̃/ in Zuberoan

<i>zahar</i>	[s̺ahar]	‘old’	vs.	<i>ahardi</i>	[ãh̃ãrdi]	‘sow’
<i>ehe</i>	[ehe]	‘wash water’	vs.	<i>ehe</i>	[ẽhẽ]	‘no! (emphatic)’
<i>bihi</i>	[bihi]	‘grain’	vs.	<i>mihi</i>	[mĩhĩ]	‘tongue’
<i>bühürt</i>	[byhyrt]	‘twisted’	vs.	<i>zühür</i>	[s̺yh̃y̺r]	‘wise’

There is also a modern minimal quadruplet contrast intervocallically in Modern Zuberoan between /h/, /h̃/, /n/ and zero: *ehi* [‘ehi] ‘finger’ (< Literary Zuberoan *erhi*) vs. *ehi* [‘ẽhĩ] ‘easy’ vs. *eni* [‘eni] ‘to me’ vs. *ei* [e̺] (< Literary Zuberoan *eri*) ‘ill’ (cf. Lafon 1958).

Under Hualde’s analysis, surface nasalized vowels are created when nasalization of the underlying nasalized aspirate spreads to adjacent segments (Hualde 1993: 294–295). The alternative analysis, originally proposed by Larrasquet (1932: 168), and later adopted by Michelena (2011b [1977]), is that nasalization of aspirates is allophonic, with nasalization spreading from adjacent nasalized vowels to /h/. Since contrastive nasalized vowels are independently necessary in all analyses of Zuberoan based on data like that in (3), the analysis where nasalization of /h/ is allophonic appears simpler. In addition, given the rarity of /h/ vs. /h̃/ contrasts crosslinguistically, Hualde’s proposal could be questioned on typological grounds.

## (3) Contrastive vowel nasalization in Zuberoan

Oral vowel	Nasalized vowel
<i>biga</i> ‘two’	<i>bigã</i> ‘two-year heifer’
<i>dügü</i> ‘we have’	<i>hügü</i> ‘repugnance’
<i>hi</i> ‘you’	<i>fĩ</i> ‘fine, prudent’
<i>lili</i> ‘flower’	<i>lĩ</i> ‘linen’

However, as shown below, there is additional evidence that nasalized /h̃/ is a contrastive segment in Zuberoan. Following Hualde (1993: 294–295, 2003: 31), I will argue that /h̃/ is a contrastive nasalized segment which induces phonetic nasalization in neighboring vowels. Contextual nasalization is a consequence of these vowels being in a nasal environment similar to that found in sequences such as *ona* [õnã] ‘the good’ or *ama* [ãmã] ‘mother’ (cf. Hualde 1993: 294).

One argument against the spread of nasalization from vowels to /h/ involves the distribution of vowel nasalization in Zuberoan. As illustrated in (3) above, contrastively nasalized vowels in modern Zuberoan are (i) limited to /ĩ ỹ ü ã/ (Egurtzegi 2015: 4–5); and (ii) found only in word-final stressed syllables (Hualde 1993: 295; Egurtzegi 2014: 151–152). If we follow Michelena (2011b

[1977]) in deriving /h/ nasalization from surrounding vowels, the vowels in question would be the only unstressed contrastively nasalized vowels in Zuberoan. In addition, adopting the / $\tilde{V}h\tilde{V}$ / analysis with spread of nasalization to /h/ would require adding more nasalized vowels to the phonemic inventory of the language. Words like *ehe* [ɛ̃hɛ̃] ‘no! (emphatic)’, *mehe* [mɛ̃hɛ̃] ‘thin’ and *Johanne* [ʒõ'hãɲe] ‘John’ require adding at least /ẽ/, and possibly /õ/ as well. Thus, the general distribution of nasalized vowels in Zuberoan must be unnecessarily complicated for nasalization to spread from vowels to /h/. There is on the other hand a more general principle based on contrastive / $\tilde{h}$ / by which allophonically nasalized unstressed vowels, and allophonically nasalized mid vowels like [ɛ̃] and [õ] can be derived as a consequence of nasal coarticulation. If this were the only argument in favor of the contrastive nasalized aspirate, one might still lean towards the alternative due to the extreme rarity of the /h/ vs. / $\tilde{h}$ / contrast crosslinguistically, but other evidence exists.

In Zuberoan, /h/ is assimilated to [ $\tilde{h}$ ] in the context of a nasal consonant (Egurtzegi 2014: 79–81). Zuberoan examples of /h/ surfacing as [ $\tilde{h}$ ] include: *nihau(r)* [nĩ'hãũ] ‘me myself’ from *ni* ‘me’ and *hau(r)* ‘this’; *Johanne* [ʒõ'hãɲe] ‘John’, with a known Biblical origin; *ahin* [ãhĩn] ‘light’ and *ahan* [ãhãn] ‘plum’ (< Literary Zuberoan *arhin* and *arhan*). All of these examples involve etymological /h/. In these cases, nasalization in the aspirate is due to assimilation to a nasal consonant elsewhere in the word, and not a consequence of intervocalic \*VnV > VhV. This local assimilation in and of itself has little bearing on the status of / $\tilde{h}$ / in words like those in (2). However, a subsequent development strongly suggests that at the time this local assimilation occurred, nasalized / $\tilde{h}$ / was a contrastive segment in Zuberoan.

The subsequent development in question is an analogical change within the intensive pronominal paradigm. As illustrated above, secondary [ $\tilde{h}$ ] in *nihau* [nĩ'hãũ] ‘me myself’ is a consequence of a local assimilation of nasality from the initial /n/ of /ni/ ‘I’ to the second element of the compound *hau* /hau/ ‘this’ (< Literary Zuberoan *haur* /haur/). The facts of interest involve analogical extension of this second compound element with initial nasalized [ $\tilde{h}$ ] to the rest of the paradigm, despite the absence of a nasal consonant that could trigger /h/ nasalization. The full paradigm is shown in (3). On the left are the early Zuberoan forms, where nasalization of the initial segment of /hau(r)/ was found only in the first person singular, triggered by the /n/ of /ni/. In the second column are the modern Zuberoan forms showing the extension of the phonological form / $\tilde{h}$ au(r)/ ‘self’ to the entire pronominal paradigm.

- (4) Analogical extension of /h̃au(r)/ ‘self’ within the pronominal paradigm
- | Early Zuberoan            | Later Zuberoan     |                         |
|---------------------------|--------------------|-------------------------|
| <i>ni-haur</i> [ni'h̃ãũr] | /nih̃au/ [ni'h̃ãũ] | ‘me myself’             |
| <i>hi-haur</i> [i'h̃ãũr]  | /hih̃au/ [i'h̃ãũ]  | ‘you yourself’          |
| <i>zi-haur</i> [ʒi'h̃ãũr] | /ʒih̃au/ [ʒi'h̃ãũ] | ‘you yourself’ (formal) |
| <i>gi-haur</i> [gi'h̃ãũr] | /gih̃au/ [gi'h̃ãũ] | ‘we ourselves’          |

In all but the first person singular, there is no historical or synchronic contextual source for the nasalization of /h/. In order for the [h̃] in [ni'h̃ãũ] to extend to the rest of the paradigm, the contextually conditioned phonetic variant [h̃] must have been phonologized (i.e. form part of the phonologically contrastive inventory in speech communication; cf. Janda 2003: 409). We conclude that at the time of this analogical extension, the opposition between /h/ and /h̃/ was contrastive in Zuberoan, and has remained so to this day. At the same time, these examples cannot be easily accounted for under an analysis where /h/ nasalization is allophonic due to spread from adjacent nasalized vowels. Under such an account, an abstract nasalized vowel would need to be posited for the morpheme /hau/, though the vowel would only trigger nasalization within this pronominal subparadigm and not in the bare demonstrative *hau* [hau]. In sum, analogical extension of a pronominal form beginning with /h̃/ suggests that this segment was contrastive at the time the paradigmatic shift took place.

### 2.3 Comparative evidence for Zuberoan /h̃/: Mixean low navarrese /h̃/

Beyond Zuberoan, one other modern dialect appears to preserve and extend a contrast involving /h/ (from historical /h/) versus nasalized /h̃/ from historical intervocalic \*n. The variety in question is Mixean Low Navarrese as spoken in the region of Mixe (Basque Amiküze) and described by Camino (2016). Unlike Zuberoan, where contrastive nasalized vowels occur in final stressed syllables (3), there is no evidence in modern Low Navarrese for contrastively nasalized vowels. Nasalized vowels are found only in words containing an aspirate, and, for the most part, these words are cognate with Zuberoan words with nasalized /h̃/. Cognate words in the two eastern varieties involving both aspirates are shown in (5) with Standard Basque forms for comparison.

## (5) Contrastive /h̃/ in Mixean Low Navarrese

Mixean	Zuberoan	Standard Basque	Gloss
<i>hasi</i>	<i>hasi</i>	<i>hasi</i>	‘begin’
<i>hirü/hiü</i>	<i>hiü</i>	<i>hiru</i>	‘three’
<i>ahür</i>	<i>ahür</i>	<i>ahur</i>	‘palm (of the hand)’
<i>behi</i>	<i>behi</i>	<i>behi</i>	‘cow’
<i>zahar</i>	<i>zahar</i>	<i>zahar</i>	‘old’
<i>ãhãrdi</i>	<i>ãhãrdi</i>	<i>ahardi</i>	‘sow’
<i>ãhãtiak</i>	<i>ãhãtiak</i>	<i>ahateak</i>	‘ducks’
<i>lēhēn</i>	<i>lēhēn</i>	<i>lehen</i>	‘first’
<i>ĩhĩzin</i>	<i>ĩhĩzin</i>	<i>ehizan</i>	‘hunting’
<i>ũhũre</i>	<i>ũhũe</i>	<i>ohore</i>	‘honor’

Since there is general agreement on the sound change of  $*VnV > VhV$  in the history of Basque, and good evidence for this in Latin loans (e.g. Zuberoan *ũhũe* ‘honor’ <  $*onore$  < Lat. *honore*), Mixean Low Navarrese appears to be conservative in retaining nasalized /h̃/ in these contexts. However, in Mixean, one cannot derive synchronic nasalization of aspirates from nasalized vowels, since contrastively nasalized vowels do not exist. The Mixean data in (5), then, not only lends further support to a contrast between /h/ and /h̃/ in Zuberoan, but also argues for the same contrast in Mixean Low Navarrese, and, more generally, for this as a conservative inherited feature continued from an earlier stage of Basque.

### 3 Conclusions

In addition to languages such as Kwangali, Seimat, Aguaruna and Arabela, there is an arguable contrast between oral and nasalized /h/ in two modern varieties of Basque: Zuberoan and Mixean Low Navarrese. Where earlier authors suggest that the nasalization of h in Zuberoan be derived from spread of nasalization in adjacent nasalized vowels, Hualde (1993) suggests an alternative where nasalization of the aspirate is contrastive, and spreads to neighboring vowels. Building on Hualde’s analysis, I argue above that the distribution of nasalized aspirates in Zuberoan cannot be adequately handled via assimilation from neighboring nasalized vowels without increasing the complexity of the nasalized vowel system. A stronger argument for a contrastively nasalized /h̃/ is the analogical extension of this segment in initial position of a morpheme, /h̃aʉ(r)/, within a subpart of the pronominal paradigm. Since no nasalized

vowels are present where this form has been extended, there is no phonological source of nasalization, and nasalized /h̃/ should be analyzed as basic and contrastive. Finally, comparative evidence from the Mixean variety of Low Navarrese shows cognate words with nasalized aspirates to those found in Zuberoan. However, Low Navarrese lacks contrastively nasalized vowels. Therefore, the alternative analysis, where nasalization spreads from vowels to /h/ is not possible in this variety. I conclude that /h̃/ is contrastive in both Zuberoan and Mixean Low Navarrese, and that this is a conservative feature of these dialects, directly inherited from earlier stages of Basque. Contrastive /h̃/ evolved from \*n intervocalically, and the category was apparently strengthened by contextual nasalization of /h/ in nasal domains.

While the study of Basque phonology has not yielded many typological rarities, this detailed reconsideration of Zuberoan aspirates demonstrates the importance of holistic approaches to grammar incorporating phonetic, phonological and morphological detail. Without evidence from the pronominal paradigm, the arguments for a nasalized aspirate would be equivocal. At the same time, this study also illustrates how small endangered varieties of languages can be the repository of linguistic information of great value. In this case, the Mixean Low Navarrese words with nasalized aspirates allow us to confirm an analysis where the /h/ vs. /h̃/ contrast is basic, and not derived through vowel nasalization. At the same time, Zuberoan itself, a small and endangered variety of Basque, reveals what, phonetically, was thought to be a difficult or impossible contrast (Ohalá 1975), instantiates the predictions of phonological theory (Walker and Pullum 1999).

**Acknowledgments:** I am greatly indebted to Juliette Blevins, José Ignacio Hualde, Joseba Lakarra and two anonymous reviewers of *Linguistics* for their insightful comments and suggestions that have considerably improved this paper. All remaining errors are mine.

**Funding:** This research has been partially funded by the Spanish Ministry of Economy and Competitiveness [FFI2016-76032-P; FFI2015-63981-C3-2; FJCI-2014-21348] and the Alexander von Humboldt Foundation.

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