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New Perspectives on the Development of Galego from Galician

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1. Introduction

Present-day Galego dialect data from the Atlas Lingüístico Galego (ALGa) (Instituto da Lengua Galega 1990a, 1990b, 1995) does not logically follow from the standard historical account of the development of Galego from Galician reported in Agard (1984). Specifically, the historical account claims that the alveolar nasal consonant and nasalization on the preceding vowel were both deleted, but some modern dialects have a velar nasal consonant following non-nasal vowels. If the alveolar nasal and vowel nasalization were both deleted, we have no principled explanation for the appearance of these "new" velar nasals, which we find *only* in environments which historically had an alveolar nasal. In this paper, we propose an alternate historical account which accounts for the data in the dialect atlas, and we discuss how data collected now can shed light on past historical change.

In 2.0, we offer a brief overview of the relevant historical linguistic information regarding modern Galego.[2] In 3.0, we summarize Agard's (1984) historical account of the nasal consonant in Galego. In 4.0, we discuss the behavior of the modern velar nasal as reported in the ALGa, and the isoglosses we drew based on this data. In 5.0, we propose a revision of the standard historical account that is consistent with the facts presented in three. In 6.0 and 7.0, we test our analysis by applying it to additional data from Pérez (1982) and the ALGa. Finally, in 8.0, we consider the methodological implications of this study.

2. Historical overview

[1] We would like to acknowledge some of the many people who have contributed to this project. William Labov offered encouragement from the beginning; Dave Schueler was heavily involved in the earliest stages of this research. We received helpful comments, suggestions, and encouragement from Damien Hall, Gillian Sankoff, David Heap, Dennis Preston, Anne Violin-Wigent, Jaclyn Ocumpaugh, Jessi Aaron, and audiences at the Methods in Dialectology conference in Moncton and the Hispanic Lingusitics Symposium at the Pennsylvania State University. Any remaining errors are, of course, our own.

[2] 'Galego' is the modern language descended from Galician. Galicia(n) is still used as an areal term.

The four Galician provinces (A Coruña, Ourense, Pontevedra, and Lugo) are located in the extreme northwest region of Spain (Map 1). Portugal borders the Galician provinces to the south, and Modern Galego is most closely related to Portuguese, as in the abbreviated family tree in Figure 1 (adapted from Agard 1984). The Asturian lects are spoken in the Spanish provinces bordering the Galician provinces to the east. To the north and west, Galicia is bordered by ocean.

Map 1. Galician Provinces in the Northwest of Spain.

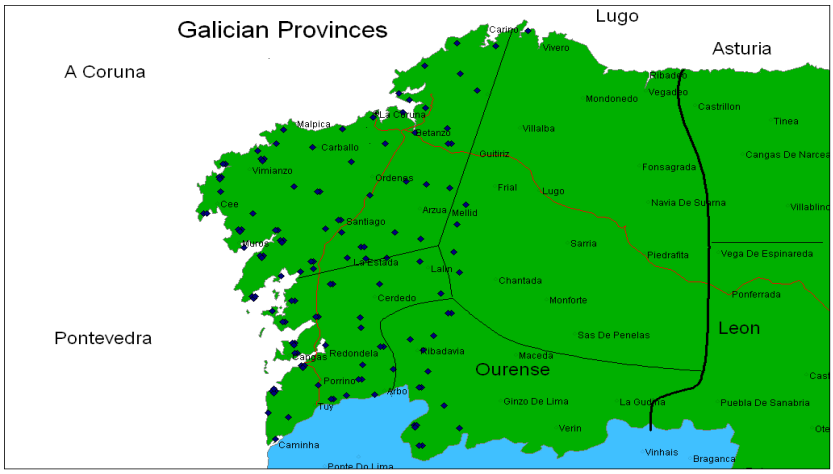
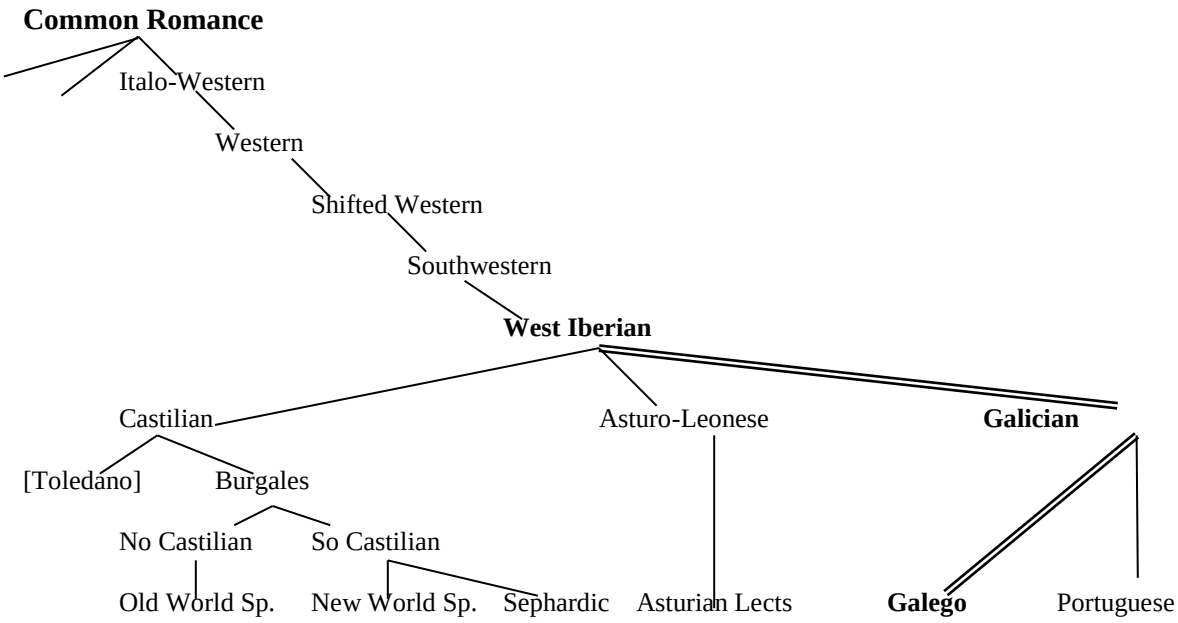


Figure 1. Italo-Western Branch of Common Romance Family Tree (adapted from Agard 1984).



One major set of sound changes that differentiates Galician from other West-Iberian languages is the nasalization of vowels before nasal consonants and the (reported) subsequent loss of the nasal consonant (Agard 1984). Contrary to such reports, the nasal consonant exists for many speakers in the ALGa, and exhibits geographic variation in modern Galego. What follows is an attempt to reconcile the standard historical account with the modern facts. We begin by summarizing the standard historical account in the next section.

3. Historical account of the velar nasal

According to Agard (1984), when West-Iberian split three ways to Castilian, Asturo-Leonese, and Galician, vowels preceding nasal consonants in the Galician dialects became nasalized. Agard does not provide formal rules describing this and other historical changes, so for the sake of comparison, we wrote (1)-(5) based on the generalizations provided by Agard (1984: 99-100, 116). *Nasalization* is shown in (1).

(1) V → [+nasal] / ___ C [+nasal] *Nasalization* (based on Agard 1984:99-100)

Then, [l] and [n] were lost intervocalically; the nasal was also lost word finally (ex. /vino/ > /vĩno/ > /vĩo/ ‘wine’; *Nasal Consonant Deletion* (2)). This brought oral and nasal vowels into contrast (Agard 1984). We will focus on the loss of the nasal sound as the lateral is not relevant to this discussion.

(2) C → Ø / V ___V; __# *Nasal Consonant Deletion* [+nasal] (based on Agard 1984:99)

Next, word-final strings of two back vowels (*Diphthong Simplification A,* (3a)) or two low vowels (*Diphthong Simplification B,* (3b)) merge into a single vowel. The single vowel is nasal if the first member of the string was nasal (e.g. /paa/ > /pa/ ‘shovel’; /bɔ̃o/ > /bɔ̃)/ ‘good’; /ũo/ > /ũ/ ‘one’; /soo/ > /sɔ/[3] ‘single, only’) (Agard 1984:116).

(3a) V → Ø / V __# [+back] [+back] *Diphthong Simplification A* (based on Agard 1984:116)

(3b) V → Ø / V __# [+low] [+low] *Diphthong Simplification B* (based on Agard 1984: 116)

[3] It is unclear why the vowel quality in /soo/ changes. As Agard gives only the four examples listed above, we do not have enough information to incorporate this observation into the *Diphthong Simplification* rules, this phenomenon is unlikely to affect the rest of the analysis.

Later, a "transitory /ɲ/" was inserted between /ĩ __V/ (*Insertion of /ɲ/*, (4)), which merged with the existing /ɲ/ (ex. /vĩo/ > [vĩɲo] 'wine') (Agard 1984: 116). Then, most nasal-oral vowel strings denasalized the first element (5), including /ĩɲo/, despite the non-adjacent vowels[4] (/vĩɲo/ > /viɲo/ 'wine'; /mõeda/ > /moeda/ 'money, coin'). The exception to denasalization is ã+o, which remains in contrast with a+o (ex. /mão/ 'hand' + /mao/ 'bad') (Agard 1984). Agard does not formalize the reason that /ão/ alone remains nasal, so we formulated (5) to operate generally with the caveat that /ão/ is an exception.

(4) Ø → C / V ___ V *Insertion of /ɲ/*
[+nasal] [+nasal] (based on Agard 1984:116)
[+high] [+high]

(5) V → [-nasal] / ___ V *Denasalization*
except ão (based on Agard 1984:116)

To summarize, Agard's account involves the nasalization of vowels before nasal consonants, subsequent loss of the nasal consonant, falling together of diphthongs, the appearance of a new (palatal) nasal consonant, and finally, the denasalization of most nasal vowels. Derivations of selected lexical items based on this analysis are provided in Table 1. It is important to note that the formalization of Agard's rules predicts something different than the spirit of his generalization suggests with respect to nasalization. Agard says that denasalization occurs "before another vowel" (PG), except for /ão/. This suggests that word final or morpheme final vowels may not be denasalized (as in 'carpins'), but we think he must have meant to include these items. Also, we suspect that Agard proposes /ɲ/ Insertion as "transitory" so as to include the denasalization of /ĩ/ in this generalization. As we will see, a strict interpretation of Agard's analysis predicts forms unattested in the modern dialect data, but the analysis is salvageable with slight adjustments.

Table 1. Derivations based on Agard (1984).*

Gloss → / Rules ↓ UR →	*pointed shoes* carpins	*brother* irmano	*brothers* irmanos	*sister* irmana	*wine* vino
(1) Nasalization	carpĩns	irmãno	irmãnos	irmãna	vĩno
(2) Deletion of Nasal Consonant	carpĩs	irmão	irmãos	irmãa	vĩo
(3a) Diphthong Simplification A	----	----	----	----	----
(3b) Diphthong Simplification B	----	----	----	irmã	----
(4) Insertion of / ɲ/	----	----	----	----	vĩɲo
(5) Denasalization	----	----	----	----	viɲo
Surface Forms	**carpĩs**	**irmão**	**irmãos**	**irmã**	**viɲo**

* '----' indicates that a rule does not apply for a given form.

[4] Presumably, Agard refers to the /ɲ/ as "transitory" so as to include the /ĩɲo/ words in the generalization he makes about denasalization.

4. Modern distribution of the velar nasal

Some data in modern Galego is consistent with this account (ALGa 1995). For example, eastern speakers have no nasal consonant (as predicted by (2)) except after /i/ as in *miña* 'mine' (predicted by (4)). We found no counterexamples to (3a) and (3b). Rule (5) correctly predicts nasalization for /viŋo/[5]. With respect to the presence or absence of the velar nasal, which is our main concern here, all Eastern speakers have the surface forms derived in Table 1.[6]

ALGa data contradicts Agard's analysis on two points: vowel nasalization and the presence of a nasal consonant. We will first deal with nasalization. Where Agard predicts /carpĩs/, /irmão/, /irmãos/, and /irmã/, Galician speakers have /carpis/, /irmao/, /irmaos/, and /irma/. Only a few speakers along the Asturian border actually have the nasalized vowel that Agard predicts in these four words. We did not investigate whether vowel nasality was contrastive. Later, we propose a revised *Denasalization* (9) to account for this data. On the second point, ALGa speakers in Western Galicia have a velar nasal in places where there was historically an alveolar nasal. Agard indicates that the alveolar nasal was deleted, but makes no mention of the velar nasal. Instead of /carpis/, /irmao/, /irmaos/, and /irma/, western speakers have /carpĩŋs/, /irmãŋo/, /irmãŋos/, and /irmãŋ/. Speakers in a central zone use a mixture of nasal and non-nasal forms, but the variation is interlexical for the most part. In other words, individual lexical items consistently either have a nasal consonant with nasalized vowels or do not.[7] However, lexical items with analogous historical forms may not all pattern analogously in the modern data for central speakers with respect to the presence or absence of the nasal consonant and nasalization, suggesting that lexical diffusion is at least partially responsible for the modern data.

If we assume that Agard's analysis is accurate and we wish to explain the ALGa data, we must say that the "insertion" of /ŋ/ followed *Denasalization* (5). Such an analysis would then have to explain why the velar nasal is found only in places where the alveolar nasal existed historically, even though those places are no longer marked by a nasalized vowel (or anything else). If, however, we assume that Agard is completely wrong and that *Nasal Consonant Deletion* (2) did not occur, we have to explain why the nasal quality changed from alveolar to velar for some but not all alveolar nasals, and here, too, there is no obvious conditioning factor. Given the place of articulation differences and the data on vowel nasalization, we propose a compromise position. That is, we conclude that (2) did, in fact, occur, and that the modern consonant is the result of some additional nasal insertion rule similar to (4), which would have occurred at about the same time as (4), i.e. crucially before nasalization was lost in (5). In order to get at a

[5] Data for *viño* is not reported in the ALGa, but data for the diminutive suffix *–iño* is reported (Map 89). Since the /i/ in *–iño* is not nasalized, we argue that it is unlikely that the /i/ in *–iño* is nasalized.
[6] Eastern speakers' values for vowel quality may differ, however.
[7] The ALGa cites multiple pronunciations where attested, so we can be reasonably confident of this conclusion. However, most speakers are older, so it is conceivable that younger speakers may show intralexical variation in use of the velar nasal.

better historical analysis and an explanation of modern dialect areas, we will now look in detail at the ALGa data and literature on the velar nasal in Galego.

We selected all words from the ALGa with historical intervocalic or final /n/ for analysis (74 in all, Table 2). We then excluded 15 words because of insufficient data (not all data points are filled in on the maps), though we will discuss these forms further in section 6[8]. Twelve words were excluded because they contain a palatal nasal and thus do not participate in the velar nasal sound change (they pattern like /viɲo/). Seven items were excluded because no clear isogloss can be drawn. Incidentally, these are all phrases where the nasal is word final, and all but one contain only function words[9]. Four words have variants containing /l/ instead of /n/, /ŋ/, or Ø; these were also excluded. *Uns* 'some' was excluded because it does not pattern like *un* and *unha*. [10, 11] Four words were excluded because the nasal sound, where found, is not phonetically transcribed. Finally, two words have an alveolar nasal rather than a velar one. We suspect that the alveolar form may be the result of contact with Castilian Spanish, and so exclude these words from the analysis. Thus, our analysis is based on pronunciation data from 29 words. Table 2 lists words included in and excluded from the analysis, with glosses, ALGa map numbers, and for excluded words, the reason they were excluded.

[8] We opted not to base our analysis on these data because of the missing data points. However, in 6 we show that the available data for these words are consistent with our analysis.

[9] For these words, speakers had either a velar nasal, an alveolar nasal, or no nasal at all. Many speakers had more than one variant. The velar nasal is the variant expected word finally; the alveolar one is expected intervocalically, among other places. Thus, while the Ø variant may be the result of the historical nasal deletion in (2), the place of articulation in the nasal variants may be due to whether or not speakers analyze the phrase (e.g. *con eles*) as a one word nexus or as two words. Lipski (1979) offers a fuller explanation.

[10] For *uns*, the non-nasal variants are sprinkled down the center of Galicia, with nasal users all around, rather than the East-West distinction we describe in more detail below. The data for this word will also be discussed in 6

[11] There is a clear isogloss boundary between /uŋs/ and /uŋos/ rather than /uŋs/ and /uws/, as is the pattern for all other cases (see Lipski 1979).

Table 2. Words considered for use in the analysis.

Map #[12]	Words	Gloss	Reason Excluded	Map#	Words	Gloss	Reason Excluded
31	irmán	'brother'	----	39	nugallán	'lazy person'	insufficient data
32	irmá	'sister'	----	40	marrao	'pig'	insufficient data
33	gran	'grain'	----	45	choronas	'weepers, whiners'	insufficient data
35	chan	'ground'	----	46	solteirona	'old maid'	insufficient data
36	verán	'summer'	----	47	patron	'employer'	insufficient data
37	man	'hand'	----	47	patrona	'landlady'	insufficient data
38	mazá	'apple'	----	48	ruín, ruína	'mean; ruins'	insufficient data
41	ladron	'thief' (m.)	----	61	amallós	'shoelaces'	insufficient data
42	ladrona	'thief' (f.)	----	64	folgazáns	'loafers (people)'	insufficient data
43	lambon	'lover of food' (m.)	----	65	bens	'good' (pl.)	insufficient data
44	lambona	'lover of food' (f.)	----	66	roibens	'ruddy, reddish'?	insufficient data
63	irmáns	'brothers'	----	80	xabarín	'wild boar(s)' ?	insufficient data
67	carpíns	'pointed shoes'	----	80	xabaríns	'wild boar(s)' ?	insufficient data
68	pantalóns	'pants'	----	145	min	'my'	insufficient data
69	luns	'Monday'	----	89	-iño	diminutive suffix	palatal nasal
203	co	'with the' (m.)	----	90	burriño	'donkey'	palatal nasal
204	coa	'with the' (f.)	----	91	sobriño,	'nephew'	palatal nasal
218	un, unha	'one'	----	91	sobriña	'neice'	palatal nasal
220	nun	'in a'	----	92	veciño	'neighbors'	palatal nasal
221	dun	'of a'	----	92	veciños	'neighbors'	palatal nasal
222	cun, cunha	'with a'	----	93	madriña	'godmother'	palatal nasal
257	ningún	'no one'	----	94	galiña	'hen'	palatal nasal
258	ningunha	'no one'	----	238	miña, miñas	'mine'	palatal nasal
327	maña	'tomorrow'	----	331	axiña		palatal nasal
351	en	'in'	----	95	ferreña	'noisemaker, tambourine'	palatal nasal
361	pola maña	'in the morning'	----	165	con eles	'with them'	no clear isogloss
372	nin	'neither, nor'	----	176	non o	'not the' (masc.)	no clear isogloss
219	uns	'ones'	different nasal pattern	177	non a	'not the' (fem.)	no clear isogloss
28	bo, boa	'good'	nasal not transcribed	203	co (con o)	'with the' (masc.)	no clear isogloss
62	bos	'good' (pl.)	nasal not transcribed	204	coa (con a)	'with the' (fem.)	no clear isogloss
349	ben	'good' (pl.)	nasal not transcribed	205	en o	'in the' (masc.)	no clear isogloss
172	saudeino		variants with /l/	214	cantan a rianxeira	'(they) sing the ??'	no clear isogloss
173	veiuna		variants with /l/	123	terreo	''terrain, ground'	alveolar nasal
174	deixouno	'eleven' (masc.)??	variants with /l/	171	collérono	'collector, catcher'	alveolar nasal
175	deixouna	'eleven' (fem.)??	variants with /l/				

For most words, some speakers have a velar nasal and others have none. All speakers pattern the same for a few words, and there is occasional intraspeaker variation.

[12] Refers to the ALGa (1995) map number. All forms used here are from Volume II, Non-verbal morphology. No words in Volume I, Verbal morphology (both parts) contained VnV historically.

Velar variants occur in Western Galicia, and vary in how far east they are found. Non-nasal variants cover Eastern Galicia and vary in how far west they are found, except *lambona*, *con o,* and *con a*, where no speakers use a nasal. Occasionally, an alveolar nasal (as in the Castilian standard) is found in addition to the velar and Ø variants[13]. Table 3 lists the lexical items we examine.

Table 3. Words on which isoglosses are based, from least to most eastward-advanced.

Gloss Bundle	Map	Word	Etymology	Gloss	Historical Form	Form left of isogloss	Form right of isogloss
--	43	lambona		'lover of food' (f.)	lambona	Everyone has lamboa	
--	203	co (con o)	L. cum	'with the' (m.)	con o	Everyone has ko	
--	204	coa (con a)	L. cum	'with the' (f.)	con a	Everyone has koa, ka (alternating)	
0	33	gran	L. granum	'grain'	grano	graŋ	grao, -aw, -a
1	31	irmán	L. germanum	'brother'	irmano	irmáŋ	irmao, -aw, -a
1	63	irmáns	L. germanos	'brothers'	irmanos	irmaŋs	-aos, -aws, -as
2	36	verán	L. veranum	'summer'	verano	veraŋ	verao, -aw, -a
2	35	chan	L. planum (adj.)	'ground'	chano	chaŋ	chao, -aw, -a
3	67	carpíns	Port. crepe (?)	'pointed shoes'	carpin??	carpiŋs	-is, -iws, -ios
3	68	pantaóns	It. pantalone	'pants'	pantaloon?	pantaloŋs	-los, -loes, -lojs
3	69	Luns	L. lunis	'Monday'	luna	luŋs	lus
3	32	irmá	L. germanam	'sister'	irmana	irmáŋ	irma
4	37	man	L. maum	'hand'	mano	maŋ	mao, -aw, -a
4	38	mazá	Sp. manΘana (?)	'apple'	mazana	mazaŋ	maza
4	327	maña		'tomorrow'	mañana	mañaŋ	maña
4	361	pola maña (por a mañana)		'in the morning'	mañana	mañaŋ	maña
5	42	ladrona		'thief' (f.)	ladrona	ladra	ladroa
6	218	unha	L. unum, unam	'one' (f.)	una	uŋa	ua
6	258	ningunha	L. nec unam	'no one' (f.)	ninguna	ninguŋa	ningua
6	222	cunha (con unha)	L. cum unam	'with a' (f.)	con una	cuŋa	cua, coŋ ua
all	41	ladron		'thief'	ladron	Everyone has /ŋ/	
all	43	lambon		'lover of food'	lambon	Everyone has /ŋ/	
all	218	un	L. unum	'one'	un	Everyone has /ŋ/	
all	220	nun (en un)	L. in unum, in unam	'in a'	en un	Everyone has /ŋ/	
all	221	dun (de un)	L. de unum, de unam	'of a'	de un	Everyone has /ŋ/	
all	222	cun (con un)	L. cum unum	'with a' (m.)	con un, cun	Everyone has cuŋ or coŋ uŋ	
all	257	ningún	L. nec unum		ninguno??	Everyone has /ŋ/	
all	351	en		'in'	en	Everyone has /ŋ/	
all	372	nin		'neither, nor'	??	Everyone has /ŋ/	

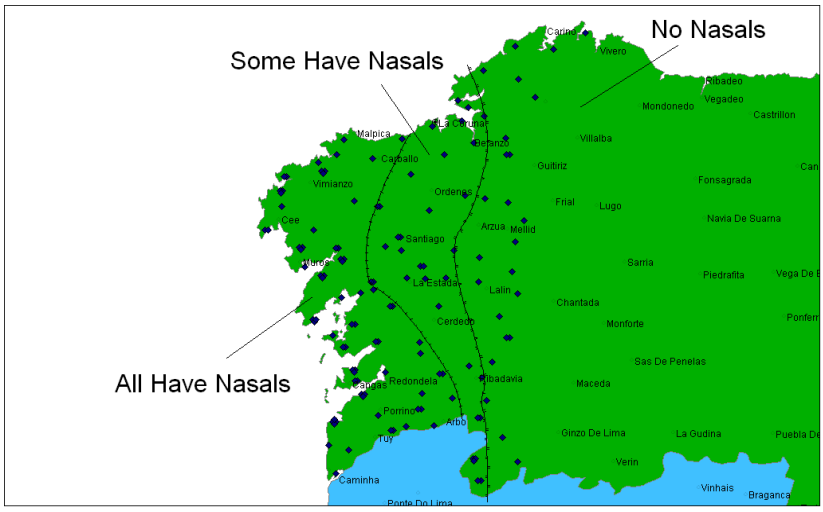
Next, we drew isoglosses for each word between places with and without a nasal using the following principles: We ignored vowel quality differences among the data

[13] Since speakers use the alveolar nasal *in addition to* other forms, the alveolar nasal is probably the result of a codeswitch to Spanish or a Spanish borrowing (see Poplack, Sankoff, and Miller 1988) for discussion of the difference between these). We do not further discuss the alveolar nasal as it is not part of the Galego linguistic system.

points and focused on the presence or absence of the nasal. To avoid distorted isoglosses, we did not separate points that showed variation (i.e. cities or towns where one person used a nasal consonant and one did not, or where one person used both a nasal variant and a non-nasal one). Instead, we aimed to separate the territory that used nasals from the territory that did not. We included areas with variation (nasal and non-nasal forms) in the "nasal" areas as long as doing so created a smooth isogloss. The "non-nasal" areas are almost completely free of nasal forms—they include them only if an informant from a particular town used both a nasal and non-nasal *and* if this point was geographically distant from the other nasals.

Next, all isoglosses were combined, and bundles were noted and numbered (Map 2). Three dialect areas are delineated. The individual isoglosses and bundles run from the north to the south. All speakers in the far western area use a velar nasal in the words *gran* to *pola maña* (listed in Table 3; isoglosses 0-4). In the east, speakers do not have a nasal in any of the words from *gran* to *pola maña*. In the central zone, speakers have /ŋ/ in some of these words but not others, suggesting a transition area. Isogloss 5 for *lambona* defines the Eastern border of the transition zone; we discuss below why it does not contain a nasal consonant. The three zones are indicated on Map 2 (West-nasal, Central-transition, East-non-nasal). We propose that these are the three major dialect areas of Galicia with respect to /ŋ/.

Map 2. Three dialect areas of Galicia.

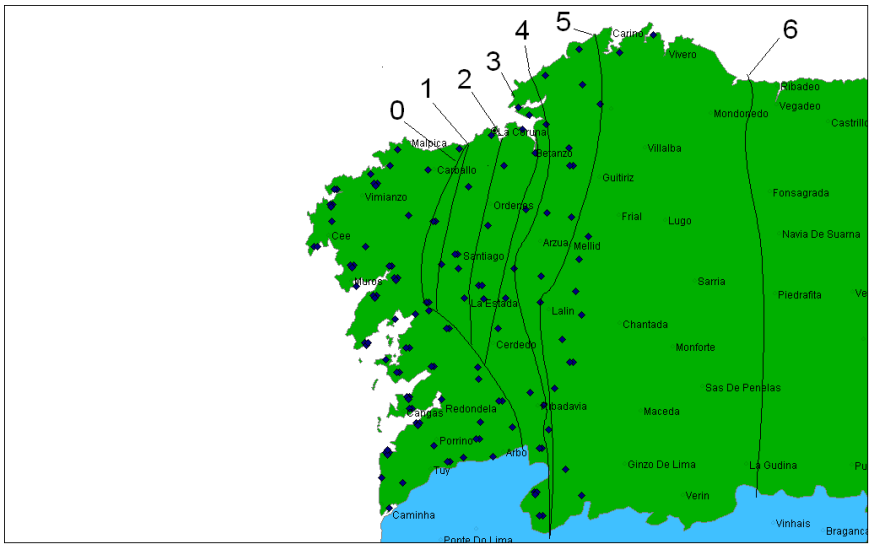


The words in Table 3 that have a velar nasal today all had diphthongs or word-final vowels historically: /ã+o/, /a+a/, /u+a/, or /V+#/, and may be singular or plural. The /ŋ/ is found after the first vowel. Where there is a second vowel historically, it is only evidenced in the non-nasal forms; in Western Galicia, the word-final vowel was deleted. The exception here is a+a—the non-nasal form has only /a/ due to (3b), above. Words

and phrases in Table 3 which were historically /o+o/ or /o+a/, regardless of whether or not a word boundary intervenes between the two vowels, do not have a velar nasal.

We further divided the central transition zone according to where isoglosses tended to bundle (Map 3). The vowels historically present in each word seem to determine where in the transition zone the isoglosses bundle. As previously mentioned, historical /ono/ and /ona/ have /o/, /oa/, and /a/ today, but no nasal consonant. All the words whose isoglosses bundle at 0, 1, or 2 have /ŋ/ after /a/; these words were historically /ano/. The words whose isoglosses bundle at 3 have /ŋ/ morpheme-finally. *Irma* 'sister' also bundles at 3 but is linguistically more like those words that bundle at 4. The words bundling at 4 have /ŋ/ word-finally after /a/; historically there words were /ana/ or /ano/. Isogloss 5 separates /ladra/ and /ladroa/ for *ladrona*. The only words with a nasal whose isoglosses bundle east of 4 are *unha* and its derivatives, at isogloss 6. The only words that have /ŋ/ over all of Galicia are *un*, its derivatives, and other words with a word-final nasal.

Map 3. Isogloss bundles in the Central-Transition Zone.



Of the words in Table 3, it is not clear that all of them participate in the sound change involving the spread of the velar nasal. Specifically, the nasal consonant in the masculine forms *ladron* and *lambon* may be velar because it is word final rather than because these lexical items were or are affected by the sound change in question. The absence of a velar nasal in the feminine forms suggest that, like *con o* and *con a*, the change did not apply to these words. The alveolar variant in the feminine forms is most likely the result of Castilian influence (note that it alternates with the other forms). We include these words in the analysis for the sake of comparison to participating words.

To summarize, in modern Galego the velar nasal is found word finally and intervocalically after /u/ (for *unha* and its derivatives), and is notably absent after /o/ except word-finally, as in (6):

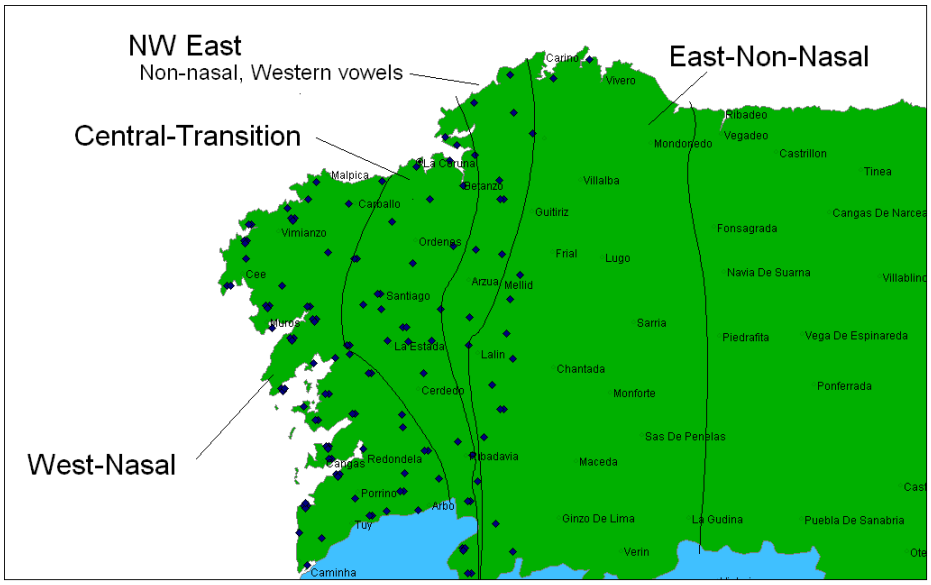
(6) u __ a# (only for *un* and its derivatives)
__ #
o ___o, a NO NASAL CONSONANT HERE

5. Revised historical account

In the compromise position that we sketched in 4, /ŋ/ is inserted before *Denasalization*. In this section, we develop our historical account more fully, drawing from the literature, formulating and revising specific rules, and illustrating these with derivations.

The outline of the historical development of /ŋ/ which we have presented so far came from our analysis of the ALGa data, but there is support for it in the literature. Garcia (1981), for example, argues that the history of *verán* 'summer' is "completely normal"—vowel nasalization occurred; the nasal was deleted; then one of three things happened: in one area, (the east) *Denasalization* occurred, producing *verao*; in the west, the velar nasal developed (*veráŋ*); and in "one small area", *Denasalization* occurred, along with deletion of the final vowel, producing *verá*. Garcia does not specify the location of this "small area" on a map, but the ALGa does. Three ALGa data points in our Central-transition dialect area have /vera/: C4, C7, and C8. These points comprise a fourth dialect area, which we call the NW East Area (Map 4). This area is characterized by vowels patterning with the West, but with no velar nasal as in the East.

Map 4. The four dialect areas of Galicia.



We argue that Garcia's description of the development of *verá*ŋ is not unique, but rather representative of all the words in Table 3, as are the observed surface forms. We can account for all of the ALGa data by adding one rule (7) to Agard's account. This sound change (*Insertion of /ŋ/*) happened for western speakers only, and it happened *before Denasalization*. The remaining historical points, then, are how the /o/ was lost after /ã/ for some speakers (West and North-Central), and the discrepancy in nasalization between Agard's historical account and the ALGa data. We will begin with the former. Because ão did not fall together in *Diphthong Simplification A* (3a), we can speculate that /a/ was [-back] at some point in time, thereby bleeding the rule. If /a/ became [+back] for western speakers and speakers in the North-Central area (8) before *Diphthong Simplification A* occurred, then */a/ Backing* would feed *Diphthong Simplification A* (3a) for these speakers. We could then predict the three surface forms Garcia notes for *verán*, as well as those found in the ALGa for *gran, chan, man, irman,* and *irmans*, which share the same historical form /-ano/, and *ladrona* with the historical form /-ona/ (but not *lambona*). Martinet (1952:7) mentions that /a/ "assumed a back value" in the Saö Miguel dialect of Portuguese (spoken in the Azores). With evidence of this similar change in a closely related dialect, it is a reasonable explanation for the Galego data. Derivations for *verán* and *irmão* in three of the four dialect areas are given in Table 4 (West (nasal), NW East (non-nasal with [+back] /a/), and East (non-nasal with [-back] /a/; in the fourth 'Central' zone). Above we noted a problem with Agard's *Denasalization* (2). In (9), we propose a revised *Desnasalization 2,* which denasalizes vowels preceding other vowels or a morpheme boundary. In Table 4, we derive *irmán* 'brother', showing how our analysis predicts the forms observed in the West, NW East, and Eastern dialect areas (recall that in the Central zone, some speakers pattern like Western speakers, and some like Eastern speakers, but this zone has no unique forms of its own).

(7) Ø → C / V ___ + (morph. boundary) *Insertion of /ŋ/*
[+nasal] [+nasal]
[-anterior]

(8) /a/ → [+back] */a/ Backing*

(9) V → [-nas] / __ [-nas] *Denasalization 2*

Earlier (Table 1), we saw that if nasalization is ignored, Agard's analysis correctly predicts the forms given by Eastern speakers, but not Western speakers or those in the NW East zone (with [+back] /a/), and if we consider nasalization, too, his analysis only predicts one surface form correctly (*viño* 'wine'). Tables 5a-b provide derivations for the same words based on our analysis.[14] With respect to the velar nasal, we account for both Eastern (5b) and Western (5a) dialects; the forms observed for the central dialect conform

[14] With respect to nasalization, we have no explanation for why *verán* is denasalized in the West—probably lexical diffusion—but not similar words (the ALGa does not indicate nasalization for *luns*), though this is not our main concern.

to either Eastern or Western dialect patterns. All forms from the NW East area conform to the derivations given in Table 4.

Table 4. Derivations based on revised account, producing three dialect areas *,**

UR	*irmano* 'brother'		
Rules ↓ DIALECT AREA→	WEST	NW EAST	EAST
(1) Nasalization	irmãno	irmãno	irmãno
(2) Deletion of Nasal Consonant	irmão	irmão	irmão
(8) /a/ Backing	irmão	irmão	
(3a) Diphthong Simplification A	irmã	irmã	--
(3b) Diphthong Simplification B	--	--	--
(4) Insertion of / ɲ/	--	--	--
(7) Insertion of /ŋ/	irmãŋ		
(9) Denasalization 2	--	irma	irmao
Surface forms	irmãŋ	irma	irmao

* '--' indicates that a rule does not apply for a given form.
** A shaded cell indicates that a rule does not apply for this dialect area.

Table 5a. Derivations for Western region of Galicia based on our analysis*

gloss	pointed shoes	Monday	summer	thief (f.)	brothers	sister	sisters	wine	lover of food (f.)
UR→	carpins	lunas	verano	ladrona	irmanos	irmana	irmanas	vino	lambona
(1) Nasalization	carpĩns	lũnas	verãno	ladrõna	irmãnos	irmãna	irmãnas	vĩno	lambõna
(2) Nasal Consonant Deletion	carpĩs	lũas	verão	ladrõa	irmãos	irmãa	irmãas	vĩo	lambõa
(8) /a/ Backing	----	lũas	verão	ladrõa	irmãos	irmãa	irmãas	----	lambõa
(3a) Diphthong Simplification A	----	lũs	verã	ladrã	irmãs	irmã	irmãs	----	lamba
(3b) Diphthong Simplification B	----	----	----	----	----	----	----	----	----
(4) Insertion of / ɲ/	----	----	----	----	----	----	----	vĩɲo	----
(7) Insertion of / ŋ /	carpĩŋs	lũŋs	verãŋ	----	irmãŋs	irmãŋ	irmãŋs	----	----
(9) Denasalization 2	----	----	veraŋ	ladra	----	----	----	----	----
surface forms	carpĩŋs	lũŋs	veraŋ	ladra	irmãŋs	irmãŋ	irmãŋs	**vĩɲo**	**lamba**

Table 5b. Derivations for Eastern region of Galicia based on our analysis*

gloss	pointed shoes	Monday	summer	thief (f.)	brothers	sister	sisters	wine	lover of food (f.)
UR→	carpins	lunas	verano	ladrona	irmanos	irmana	irmanas	vino	lambona
(1) Nasalization	carpĩns	lũnas	verãno	ladrõna	irmãnos	irmãna	irmãnas	vĩno	lambõna
(2) Nasal Consonant Deletion	carpĩs	lũas	verão	ladrõa	irmãos	irmãa	irmãas	vĩo	lambõa
(8) /a/ Backing									
(3a) Diphthong Simplification A	----	----	----	----	----	----	----	----	----
(3b) Diphthong Simplification B	----	----	----	----	----	irmã	irmãs	----	----
(4) Insertion of /ɲ/	----	----	----	----	----	----	----	vĩɲo	----
(7) Insertion of /ŋ /									
(9) Denasalization 2	carpis	lus	verao	ladroa	irmaos	irma	irmas	----	lamboa
surface forms	carpis	**lus**	verao	ladroa	irmaos	irma	irmas	**vĩɲo**	lamboa

* '----' indicates that a rule does not apply for a given form; shaded cells indicate that a given rule does not exist in a particular dialect.

Next, we discuss the propagation of the velar nasal in modern Galego. Specifically, we want to know if /ŋ/ is spreading, receding, or stable, and we want to explain any modern facts that do not precisely follow from the historical account given above. We begin with the first question, What is the direction of the change?

Several factors point to the fact that /ŋ/ is spreading rather than receding or remaining stable. First, for the points where more than one speaker was interviewed and where the two speakers were of different ages, younger speakers used /ŋ/ and older speakers did not. New forms are more often found in the speech of younger speakers, suggesting that the velar nasal is a new form. Second, though regression analysis of data from most words did not show any significant correlation with age[15], the one that did (*mazá*) showed a tendency for older speakers not to use the nasal form. Third, the isogloss for *mazá* lies along line 4 in Map 2, which is the easternmost line for words with ŋ~Ø variation. Since *mazá* with a nasal is used by younger speakers and its isogloss lies at one extreme side of the map, we can assume that this line represents advancement (not retraction or least advancement). Fourth, recall that isoglosses bundle in the center zone largely according to the vowels historically present in each, but that there are some exceptions. This indicates that the insertion rule spread to an increasing number of environments at different times, which is reflected in the eastward advancement of each. Regular spread ceased at some point; now the velar nasal is spreading eastward via lexical diffusion. Combined, these factors indicate that the presence of /ŋ/ is spreading eastward.

To be more specific, before *Denasalization*, this change spread by regular sound change mechanisms. When low vowels fell together (3b), a single, word-final vowel was left. If that vowel was nasalized, then westerners started to use /ŋ/ word-finally (7). Around the same time, the low vowel /a/ became [+back] for some speakers, allowing (3a) to apply to -ão words. This again produced a word final nasal vowel, to which (7) could also apply. The regular use of /ŋ/ in the historical -ão words spread as far east as

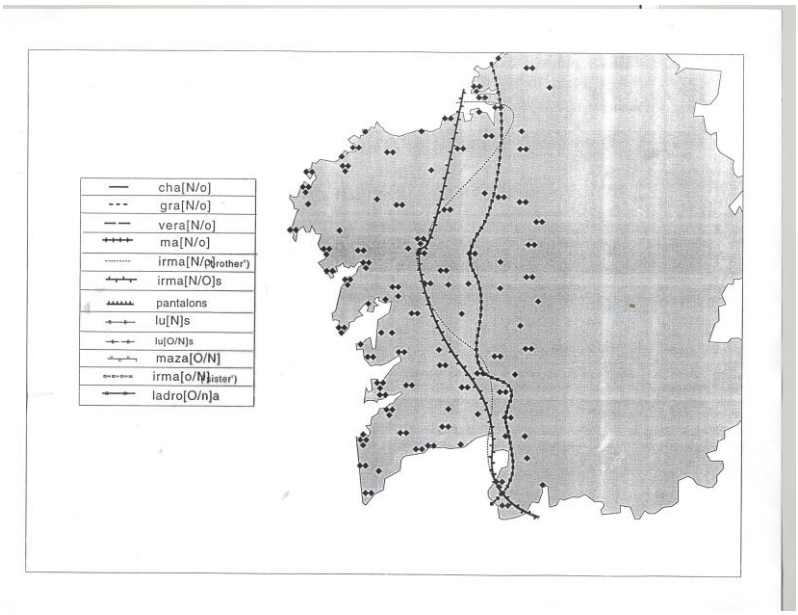
[15] This is not surprising since the ALGa methods focused on finding the oldest available speakers rather than speakers of a range of ages. This practice produced a sample pool of mostly 50-69 year olds, though both older and younger speakers were also interviewed.

the backing of /a/ was able to spread before *Denasalization* began to occur. How can the presence of the velar nasal continue to spread eastward if nasalized vowels have already been lost? Lexical diffusion is the only answer. Since *Denasalization* has now occurred in the entire Galicia territory, no speakers can begin to use the nasal as a reflex of the nasal vowel. Instead, the change is now spreading by lexical diffusion.

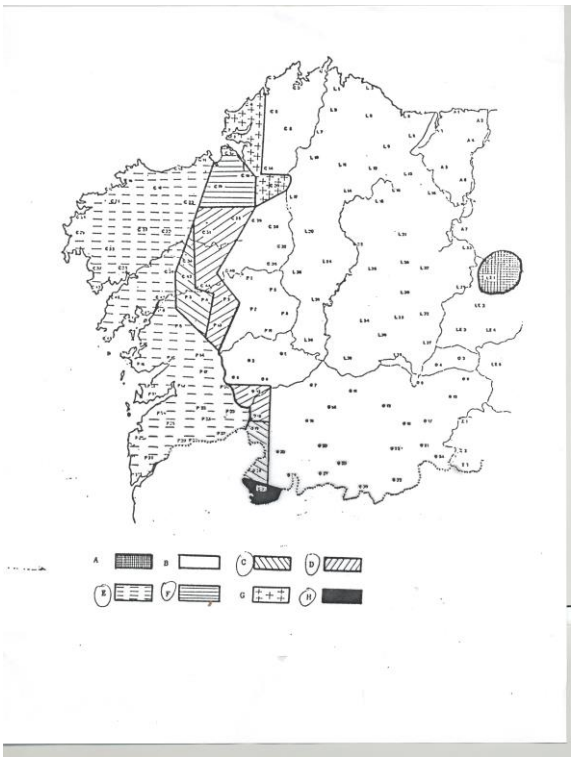
6. Gender morphology and the sound change

One final consideration is whether or not gender morphology plays a role in the spread of the velar nasal, as Peréz (1982) has suggested. Most of the words examined in Table 3 are not marked for gender. We do, however, have data for 'brother', 'sister', and 'brothers', and Peréz (1982) examines the distribution of variants of these words plus 'sisters'. Map 5 shows the isoglosses that we drew for the three words from ALGa data; Map 6 (Peréz 1982) shows areas with different combinations of forms expressing the four words. The legend for Peréz's map is given in Table 5. Differences between isoglosses in Maps 5 and 6 are due to the fact that Peréz divided areas by vowel *and* consonant differences while we drew lines only for consonantal differences, and the fact that Peréz had access to unpublished ALGa data for 'sisters'. The analysis we present here does not take gender morphology into account, although the analysis of sound change proposed here neutralizes gender distinctions in 'brother(s)' and 'sister(s)' for some dialect areas. Peréz, however, argues that gender morphology is actively involved in the sound change. Here, we summarize and evaluate his argument, arguing that a simpler and more accurate analysis is possible *without* appealing to a specific consideration of gender morphology.

Map 5. Our isoglosses for 'brother', 'brothers', and 'sister'.



Map 6: Pérez's "dialect areas" for 'brother', 'brothers', 'sister', and 'sisters'.

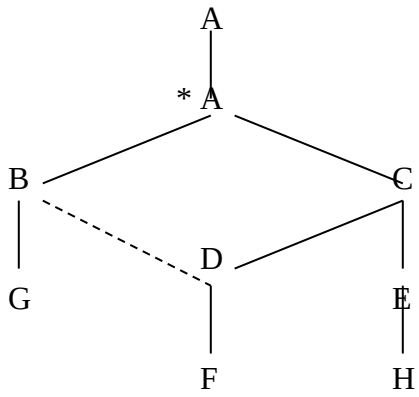


The observed forms of 'brother', 'brothers', 'sister', and 'sisters' are given in Table 5 (adapted from Peréz 1982). There are eight combinations, some containing only a few points each. Peréz calls each a 'dialect group'. He argues for the complex historical development shown in Figure 2.

Table 5. Legend for Map 4 (adapted from Peréz 1982).

Dialect Group	'brother'	'brothers'	'sister'	'sisters'
A	*irmão*	*irmãos*	*irmã*	*irmãs*
B	*irmao*	*irmaos*	*irmá*	*irmás*
C	*irmao*	*irmaos*	*irmán*	*irmáns*
D	*irmao*	*irmaos*	*irmán*	*irmás*
E	*irmán*	*irmáns*	*irmán*	*irmáns*
F	*irmán*	*irmás*	*irmán*	*irmás*
G	*irmá*	*irmás*	*irmá*	*irmás*
H	*irmán*	*irmáns*	*irmá*	*irmás*

Figure 2. Historical development of dialect areas in Map 4 (adapted from Peréz 1982).



This analysis is problematic in many ways. First, Peréz rejects an earlier phonetic analysis by Campos (1979; based on a hypothesis by Fagan 1972) because he disagrees with the aspect of the analysis whereby surface *–an* is produced by deletion of the final vowel. We disagree with this part of Campos' analysis, too, but the other aspects of it are sound.[16] Instead, Peréz argues for an analysis which is partially phonetic, and partially rooted in a functional consideration of gender marking. It begins with an unattested hypothetical state *A (in (10)) from which all dialects are derived: after Diphthong Simplification (3a and 3b), he claims that *Denasalization* occurs in 'brother(s)' but not 'sister(s)', allowing the insertion of /ŋ/ to be phonetically motivated in 'sister(s)' for some dialect groups. To get all of the observed surface forms from this start, though, he is forced to add a *Nasal Deletion* (11), *Diphthong Simplification C* (12) and derive several forms via *Analogy* (13) and *Gender Dissimilation* (14). In three of Peréz's dialect groups, gender is completely neutralized (E, F, G). His analysis holds that neutralization was conscious in two of these groups (E and F), and for H, he claims that speakers neutralized the forms via *Analogy* then separated them again via *Gender Dissimilation*[17]. He posits completely different derivations to the similar surface forms of vowels in F, G, and E/H. His overall schema (Figure 2) does not reflect the basic observations, which he himself makes, that 1) there are three main dialect areas (western-nasal, eastern-non-nasal, and central-variation), and 2) that the nasal is advancing eastward at the expense of corresponding non-nasal forms. In particular, Peréz posits three dialect groups (B/G, D/F, and C/E/H), but the divisions are unintuitive and seemingly arbitrary. Further, his derivations contradict the notion that /ŋ/ is spreading: for some dialect groups he posits insertion and later deletion of /ŋ/ (in 'sisters' for groups D and F, and in both 'sister' and 'sisters' in group H). Most importantly, however, when applied to other lexical items for which we have ALGa data, Peréz's analysis predicts forms which do not exist.

(10) V → [-nasal]/ __o *Hypothetical State ('brother' Denasal.)*

[16] These include 1) surface –ao is produced by deletion of /ŋ/ intervocalically and 2) surface –a is produced by deletion of /ŋ/ intervocalically and diphthong simplification.
[17] Labov (1994) says mergers can't be unmerged.

(11) C → Ø / V__C *Nasal Deletion*
[+nasal]
[-anterior]

(12) V → Ø / V ___ *Diphthong Simplification C*
[+back] [+low]
[-high]
[-low]

(13) Masculine forms → become same as feminine forms *Analogy*

(14) Feminine forms → become different from masculine forms *Gender Dissimilation*

Tables 6a-6c provide derivations of 'brother(s)', 'sister(s)', *carpins* 'pointed shoes', *luns* 'Monday', and *verán* 'summer' for the seven Galician dialect groups (B-H) based Pérez's (1982) analysis. Incorrectly predicted surface forms are bolded. Group A lies outside of Galicia, so no derivations are given. Speakers in Pérez's groups C, D, E, and F have a nasal in *carpins, luns,* and *irman* 'sister' (ALGa). Speakers in B, G, and H do not have a nasal in these words. Speakers in C, E, F, and H have a nasal in *verán* and *irmán*. Speakers in C, E, and H have a nasal in *irmans*. Pérez's *Nasal Deletion* rule incorrectly bleeds *carpins* and *luns* in D and F (Table 6b) in order to produce the needed forms of 'sister(s)'. The nasal consonant is incorrectly predicted in H in *carpins* and *luns* (Table 6c) in order to produce the needed forms for 'brother(s)' and 'sister(s)', but no one rule is responsible. Pérez inserts /ŋ/ in 'sister(s)' following a nasalized vowel, extends it to 'brother(s)' via *Analogy*, then deletes it in 'sister(s)' via *Gender Dissimilation*. He has to do this because he proposes a special rule for the denasalization of /ão/, which removes the phonological environment for *Insertion of /ŋ/*. In addition, he apparently[18] assumes that /a/ is [-back] at least up until the time of his *Diphthong Simplification C,* otherwise he would have no need to propose *Diphthong Simplification C*, as /ao/ would have already changed to /a/ in *Diphthong Simplification A*. In groups E, F, and H, Peréz's 'hypothetical state' incorrectly bleeds *Insertion of /ŋ/* in *verán*[19], and in C, it incorrectly bleeds *Insertion of /ŋ/* in *irmán* 'brother' and *irmáns* 'brothers'. In F, *Diphthong Simplification C* produces the incorrect surface form for *irmáns* 'brothers'.[20]

Despite the problems with his proposed development of Galician dialect areas, the areas which Peréz has identified are important. Close examination of Maps 3 and 4 shows

[18] This position is not overtly presented in the paper.
[19] Even if one were to argue that the 'hypothetical state' only applies to *irmán* and *irmáns*, Denasalization would still incorrectly bleed the surface forms.
[20] Though Peréz claims his data is from the ALGa project (albeit long before publication), the forms he gives for *irmáns* 'brothers' in F and *irmán* 'brother' and *irmáns* 'brothers' in C are not the same as those published in the ALGa (1995).

that Peréz's 'dialect groups' fit nicely into the four dialect areas that we have proposed. Specifically, Peréz's Group E is the same as our Western dialect, his 'B' is the same as our Eastern group, and his 'G' is our NW East group. All of his other groups lie within our Central transition zone. We saw in Table 5 that the analysis presented here correctly accounts for all observed forms of 'brother(s)' and 'sister(s)' for Eastern (B) and Western (E) speakers, as well as *carpins*, *luns*, and *verán*. In Table 7, we provide derivations for these seven words for the NW East area (G). We propose that the observed spreading of /ŋ/ to words for 'brother(s)' and/or 'sister(s)' in the transition zone (Dialect areas C, D, F, and H) can be explained by the lexical diffusion analysis presented above and in (15). The velar nasal spread to 'sister' in C and D, and then to 'sisters' in C only. In F, the nasal spread to singular forms but not the plural ones. Finally, in H the velar nasal spread to 'brother' and 'brothers' (illustrated in (16)). In Table 8, we illustrate how lexical diffusion produces the observed forms in dialect groups C, D, F, and H. Note in all three tables (5, 7, and 8) that our assumption that /a/ → [+back] for Western speakers early on allows us to correctly predict forms of 'brother(s)' and 'sister(s)' in E, F, G, and H without proposing a third *Diphthong Simplification* rule. Furthermore, since we retain the phonological environment for *Insertion of /ŋ/*, we have no need for Peréz's arbitrary *Analogy* and *Gender Dissimilation* rules. Clearly, the sound changes associated with the spread of the velar nasal in Galego affect gender morphology, but this is coincidental only. Incorporating gender morphology as a causal factor in historical change results in a bulky, illogical derivation which is incapable of predicting observed forms of lexical items not specifically used to build the analysis.

(15)

In C, D, and F:	irma →	irmaŋ	'sister'	*Lexical Diffusion*
In C:	irmas →	irmaŋs	'sisters	
In F and H:	irmao →	irmaŋ	'brother'	
In H:	irmaos →	irmaŋs	'brothers'	

(16)

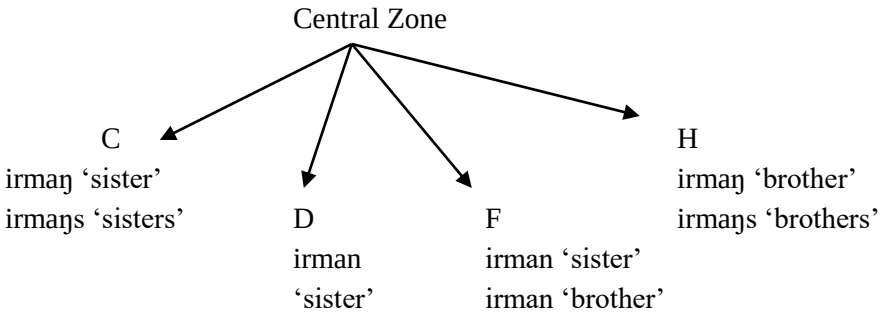


Table 6a. Derivations based on Pérez (1982). Dialect area B → G

Pérez (1982)	pointed shoes carpins	Monday lunas	summer verano	brother irmano	brothers irmanos	sister irmana	sisters irmanas	pointed shoes carpins	Monday lunas	summer verano	brother irmano	brothers irmanos	sister irmana	sisters irmanas
(1) Nasalization	carpĩns	lũnas	verãno	irmãno	irmãnos	irmãna	irmãnas	carpĩns	lũnas	verãno	irmãno	irmãnos	irmãna	irmãnas
(2) Nasal Consonant Deletion	carpĩs	lũas	verão	irmão	irmãos	irmãa	irmãas	carpĩs	lũas	verão	irmão	irmãos	irmãa	irmãas
(3a) Diphthong Simplification A	----	lũs	--	----	----	----	----	----	lũs	--	----	----	----	----
(3b) Diphthong Simplification B	----	----	--	----	----	irmã	irmãs	----	----	--	----	----	irmã	irmãs
(9)HYPHOTHETICAL STATE	----	----	verao	irmao	irmaos	--	--	----	----	verao	irmao	irmaos	--	--
(7) Insertion of / ŋ/														
(5) Denasalization	carpis	lus	--	----	----	irma	irmas	carpis	lus	--	----	----	irma	irmas
(10) Nasal Deletion														
(11) Diphthong Simplification C								----	----	vera	irma	irmas	----	----
(12) Analogy														
(13) Gender Dissimilation														
surface forms	carpis	lus	verao	irmao	irmaos	irma	irmas	carpis	lus	vera	irma	irmas	irma	irmas
	DIALECT AREA B							DIALECT AREA G						

Table 6b. Derivations based on Pérez (1982). Dialect area D → F

Pérez (1982)	carpins	lunas	verano	irmano	irmanos	irmana	irmanas	carpins	lunas	verano	irmano	irmanos	irmana	irmanas
(1) Nasalization	carpĩns	lũnas	verãno	irmãno	irmãnos	irmãna	irmãnas	carpĩns	lũnas	verãno	irmãno	irmãnos	irmãna	irmãnas
(2) Nasal Consonant Deletion	carpĩs	lũas	verão	irmão	irmãos	irmãa	irmãas	carpĩs	lũas	verão	irmão	irmãos	irmãa	irmãas
(3a) Diphthong Simplification A	----	lũs	--	----	----	----	----	----	lũs	--	----	----	----	----
(3b) Diphthong Simplification B	----	----	--	----	----	irmã	irmãs	----	----	--	----	----	irmã	irmãs
(9)HYPHOTHETICAL STATE	----	----	verao	irmao	irmaos	----	----	----	----	verao	irmao	irmaos	----	----
(7) Insertion of / ŋ/	carpĩŋs	lũŋs	----	----	----	irmãŋ	irmãŋs	carpĩŋs	lũŋs	----	----	----	irmãŋ	irmãŋs
(5) Denasalization	carpiŋs	luŋs	----	----	----	irmaŋ	irmaŋs	carpiŋs	luŋs	----	----	----	irmaŋ	irmaŋs
(10) Nasal Deletion	carpis	lus	----	----	----	----	irmãs	carpis	lus	----	----	----	----	irmas
(11) Diphthong Simplification C								----	----	vera	irma	irmas	----	----
(12) Analogy								----	----	----	irmaŋ	----	----	----
(13) Gender Dissimilation														
surface forms	**carpis**	**lus**	verao	irmao	irmaos	irmãŋ	irmãs	**carpis**	**lus**	**vera**	irmaŋ	**irmas**	irmaŋ	irmas

DIALECT AREA D	DIALECT AREA F

Table 6c. Derivations based on Pérez (1982). Dialect area C → E → H

Pérez (1982)	carpins	lunas	verano	irmano	irmanos	irmana	irmanas	carpins	lunas	verano	irmano	irmanos	irmana	irmanas
(1) Nasalization	carpĩns	lũnas	verãno	irmãno	irmãnos	irmãna	irmãnas	carpĩns	lũnas	verãno	irmãno	irmãnos	irmãna	irmãnas
(2) Nasal Consonant Deletion	carpĩs	lũas	verão	irmão	irmãos	irmãa	irmãas	carpĩs	lũas	verão	irmão	irmãos	irmãa	irmãas
(3a) Diphthong Simplification A	----	lũs	----	----	----	----	----	----	lũs	----	----	----	----	----
(3b) Diphthong Simplification B	----	----	----	----	----	irmã	irmãs	----	----	----	----	----	irmã	irmãs
(9)HYPHOTHETICAL STATE	----	----	verao	irmao	irmaos	----	----	----	----	verao	irmao	irmaos	----	----
(7) Insertion of / ŋ/	carpĩŋs	lũŋs	----	----	----	irmãŋ	irmãŋs	carpĩŋs	lũŋs	----	----	----	irmãŋ	irmãŋs
(5) Denasalization	carpiŋs	luŋs	----	----	----	irmaŋ	irmaŋs	carpiŋs	luŋs	----	----	----	irmaŋ	irmaŋs
(10) Nasal Deletion														
(11) Diphthong Simplification C								----	----	vera	irma	irmas	----	----
(12) Analogy								----	----	----	irmaŋ	irmaŋs	----	----
(13) Gender Dissimilation														
surface forms	carpiŋs	luŋs	verao	**irmao**	**irmaos**	irmaŋ	irmaŋs	carpiŋs	luŋs	**vera**	irmaŋ	irmaŋs	irmaŋ	irmaŋs
	DIALECT AREA C							DIALECT AREA E						

Table 6c. continued Derivations based on Pérez (1982). Dialect area C → E → H

Pérez (1982)	carpins	lunas	verano	irmano	irmanos	irmana	irmanas
(1) Nasalization	carpĩns	lũnas	verãno	irmãno	irmãnos	irmãna	irmãnas
(2) Nasal Consonant Deletion	carpĩs	lũas	verão	irmão	irmãos	irmãa	irmãas
(3a) Diphthong Simplification A	----	lũs	----	----	----	----	----
(3b) Diphthong Simplification B	----	----	----	----	----	irmã	irmãs
(9)HYPHOTHETICAL STATE	----	----	verao	irmao	irmaos	----	----
(7) Insertion of / ŋ/	carpĩŋs	lũŋs	----	----	----	irmãŋ	irmãŋs
(5) Denasalization	carpiŋs	luŋs	----	----	----	irmaŋ	irmaŋs
(10) Nasal Deletion							
(11) Diphthong Simplification C	----	----	vera	irma	irmas	----	----
(12) Analogy	----	----	----	irmaŋ	irmaŋs	----	----
(13) Gender Dissimilation	----	----	----	----	----	irma	irmas

surface forms	**carpiŋs**	**luŋs**	**vera**	irmaŋ	irmaŋs	irma	irmas
DIALECT AREA H							

Table 7. Derivations of the NW East dialect area (G)

Gloss	'pointed shoes'	'Monday'	'summer'	'brother'	'brothers'	'sister'	'sisters'
Rules ↓ UR →	carpins	lunas	verano	irmano	irmanos	irmana	irmanas
(1) Nasalization	carpĩns	lũnas	verãno	irmãno	irmãnos	irmãna	irmãnas
(2) Deletion of Nasal Consonant	carpĩs	lũas	verão	irmão	irmãos	irmãa	irmãas
(8) /a/ Backing	--	--	verão	irmão	irmãos	irmãa	irmãas
(3a) Diphthong Simplification A	--	--	verã	irmã	irmãs	irmã	irmãs
(3b) Diphthong Simplification B	--	lũs	--	--	--	--	--
(4) Insertion of /ɲ/	--	--	--	--	--	--	--
(7) Insertion of /ŋ/							
(5) Vowel Denasalization	carpis	lus	vera	irma	irmas	irma	irmas
Surface forms	carpis	lus	vera	irma	irmas	irma	irmas

Table 8. Lexical diffusion of /ŋ/ in the Central dialect area of Galicia (C, D, F, and H)

	CENTRAL DIALECT AREA						
gloss→	pointed shoes	Monday	summer	brother	brothers	sister	sisters
UR→	carpins	lunas	verano	irmano	irmanos	irmana	irmanas
(1) Nasalization	carpĩns	lũnas	verãno	irmãno	irmãnos	irmãna	irmãnas
(2) Nasal Consonant Deletion	carpĩs	lũas	verão	irmão	irmãos	irmãa	irmãas
(8) /a/ Backing							
(3a) Diphthong Simplification A	----	lũs	----	----	----	----	----
(3b) Diphthong Simplification B	----	----	----	----	----	irmã	irmãs
(4) Insertion of /ɲ/	----	----	----	----	----	----	----
(7) Insertion of /ŋ/							
(5) Denasalization	carpis	lus	verao	irmao	irmaos	irma	irmas
Lexical Diffusion: **In C , D, and F** **In C** **In F and H** **In H**			 veraŋ	 irmaŋ	 irmaŋs	irmaŋ	 irmaŋs
surface forms—ALL **Central zpne speakers east of D:** **C** **D** **F** **H**	carpis	lus	 verao verao verao veraŋ veraŋ	 irmao irmao irmao irmaŋ irmaŋ	 irmaos irmaos irmaos irmaos irmaŋs	 irma irmaŋ irmaŋ irmaŋ irma	 irmas irmaŋs irmas irmas irmas

7. Explaining excluded forms

Fifteen words from Table 2 (repeated in Table 9) were excluded because data was not available for all points in Galicia. In addition, four words did not have nasal quality transcribed. We are able to work three of these into our analysis since the ALGa indicates the presence or absence of the nasal consonant. For the other word (*ben* 'good'), all speakers use a nasal consonant but the quality of that consonant is not indicated. Thus, 18 additional words are discussed here. We will now consider the available data for these words in light of the analysis proposed here.

Table 9. Words with 'insufficient data'.

Bundle	Map	Word	Gloss	Historical Form	Form left of isogloss	Form right of isogloss
--	28	boa	'good' (f.)	bona	Nasal not transcribed—everyone has boa	
--	40	marrao	'pig'	marrano	Everyone has marrao only or alternating with marra	
--	45	choronas	'weepers, whiners'	choronas	Everyone has –oas alternating with Castilian -onas	
--	46	solteirona	'old maid'	solteirona	Everyone has –oas alternating with Castilian -onas	
--	62	bos	'good' (pl.)	bonos	Everyone has -oas	
0a	80	xabaríns	'wild boars'		-iŋs	-is, iños, -inos, -lVs
0	39	nugallán	'lazy person'		aŋ	ao
0	66	roibéns	'ruddy, reddish'?		-eŋs	-es
1	64	folgazáns	'loafers (people)'		-aŋs	-as
2	65	bens	'good' (pl.)		-eŋs	-es
3/5	28	bo	'good' (m)	bono??	bo	bon (nasal not transcribed)
5	48	ruín	'mean'		-iŋ	-iño
5	48	ruína	'ruins'		-iŋ	-iña, -ia
all	47	patrón	'employer'		Everyone has -oŋ	
all	47	patrona	'landlady'		Everyone hsa -ona	
all	80	xabarín	'wild boar'		Everyone has –iŋ; alternates with –il	
all	145	min	'my'		Everyone has -iŋ	
all	214	cantan a rianxeira	'sing the ??'		Everyone has cantaŋ a; alternates with cantan a	

Using the same procedures described in section 3, we drew isoglosses for each word in Table 9.[21] Most isoglosses bundled with existing glosses (as shown in Table 9). By adding another isogloss (0a) we can account for all of the data. We drew 0a to the west of 0 for *xabaríns*. This was the only word for which the missing data (from speakers of Western Galicia) might make a difference in the position of the isogloss. Depending on what these speakers do, *xabaríns* may actually conform to bundle 0.

It is not clear, however, that all of these words are part of the spread of the velar nasal. When the -ona words (*choronas, solteirona, patrona*) have a nasal, it is alveolar—this is probably a Castilian influence rather than a result of sound change. For –in and –ina words (*ruin, ruína, xabaríns*), speakers west of the isogloss have *–iŋ* for both the masculine and feminine, which is what we would expect from words participating in this change, but words to the east of the isogloss have a palatal nasal followed by –o or –a or (for *ruína* only), suggesting that at least some speakers applied *Insertion of /ɲ/* (4) rather

[21] There was enough data to draw an isogloss for all words in Table 9.

than *Insertion of /ŋ/* (7). In addition, some speakers use /l/ in *xabarín* and *xabaríns*; this may be due to a Castilian influence.

At first blush, *bo* 'good' appears to contradict the West-nasal/ East-non-nasal pattern seen in the other words—we find the nasal variant in the east for this word, but we have no information on the quality of the nasal (alveolar or velar or other). If we draw an isogloss separating the nasal and non-nasal forms of *bo* 'good', we find a line which bundles at 3 in the northern half of Galicia territory. The non-nasal variant spreads farther to the east in the southern half, bundling at 5.

There is one phrase in this data set: *cantan a rianxeira*. All speakers use a nasal, but the nasal quality varies: velar alternates with alveolar. This is probably related to syllabification. If speakers analyze *cantan a* as separate words, the alveolar can surface, but if *a* forms a nexus with the following noun, the velar surfaces.

The remaining six words (*marrao*, *nugallán*, *roibéns*, *folgazáns*, *bens*, *min*) pattern just as the other forms presented in Tables 5a and 5b for Western and Eastern speakers respectively.

8. Conclusions

We have seen that Galicia can be divided into three general territories according to their use of /ŋ/—in the west, speakers use /ŋ/ in all of the words; in the east, speakers do not use /ŋ/ for any of the words; and in the central zone, speakers use /ŋ/ for some of the words. The velar nasal is the newer variant, and is currently spreading eastward via lexical diffusion (though the change once proceeded by regular processes). If we also consider vowels, a fourth dialect area emerges (what we have called the NW East zone). To accurately account for the observed dialect areas, we saw that it was necessary to add one sound change (Insertion of /ŋ/ (7)) and one assumption (*/a/ Backing* (8)) to Agard's (1984) historical account of the change from Galician to Galego to account for the western and NW East speakers, and that it was necessary to assume lexical diffusion to account for the recent changes in the central transition zone. Finally, lexical diffusion can affect gender marking—in some places, the gender marking on 'brother(s)' and 'sister(s)' is completely neutralized. However, overt consideration of gender marking does *not* explain the observed sound change. Table 10 summarizes the various historical accounts mentioned in this paper with critical commentary.

Our hypothesis can be confirmed with additional data. We plan to incorporate data from the Linguistic Atlas of the Iberian Peninsula (Heap 2003), which was collected between 1931 and 1954, into the analysis in the future.

Our goal at the outset of this project was simply to uncover dialect areas in Galicia (if any), and to understand how sound change progressed through the territory to produce these dialects. Once we drew the isoglosses in Map 1, we started with Agard's (1984) historical account of Galician to Galego, and tried to derive the modern dialects from there, but quickly realized that if we accepted his account as is, we had no way to explain the presence of the velar nasal for western speakers. The ALGa data (1995) was not available to Agard, and we do not know what his data looked like, but we assume that

his account would have been different if he had had access to the ALGa data. Perhaps, though, Agard was not concerned with variation within Galego, but between Galego and Portuguese only. In this respect, he may have chosen the eastern speakers on which to base his analysis (arbitrarily or for some unknown reason), and may have chosen to ignore other variation. We argue that historical linguistics can only be enhanced by consideration of variation, and it's never too late to start—today's variation speaks to yesterday's language change. Dialect investigations such as ours have much to add to historical linguistics.

Table 10. Comparison of Historical Account of Galician Nasals.

Sound Change	Agard (1984)	Lipski (1975)	Pérez (1982)			Sanchez and Conn (2005)	
Nasalization	V → [+nas] / ___ C [+nas]	V → [+nas] / ___ C [+nas]	V → [+nas] / ___ C [+nas]			V → [+nas] / ___ C [+nas]	
Deletion of Nasal Consonant	C → Ø / V ___V; __# [+nas]	C → Ø / V ___V; __# [+nas]	C → Ø / V ___V; __# [+nas]			C → Ø / V ___V; __# [+nas]	
/a/ Backing						/a/ → [+back]	
Diphthong Simplification A	V → Ø / V __ [+back] [+back]		V → Ø / V __ [+back] [+back]			V → Ø / V __ [+back] [+back]	
Diphthong Simplification B	V → Ø / V __ [+low] [+low]		V → Ø / V __ [+low] [+low]			V → Ø / V __ [+low] [+low]	
HYPOTHETICAL STATE			V → [-nas] / ___ o [ão → ao only]				
Insertion of / ɲ /	Ø → C / V ___ V [+nas] [+nas] [+high] [+high]	Ø → C / V ___ V [+nas] [+nas] [+high] [+high] biphonemic interp of V+nas				Ø → C / V ___ V [+nas] [+nas] [+high] [+high] biphonemic interp of V+nas	
Insertion of / ŋ/		Ø → ☠ / u ___ a [in *umha*]	Ø → ☠ / V ___ [+nas]			Ø → C / V___ + [+nas] [+nas] [+bck]	
Denasalization	V → [-nasal] / ___ V *except /ão/		V→ [-nas] /__ V [-low]		V → [-nas]/__ V [-low]	V → [-nas]/__ V , C [-nas] [-nas]	
Nasal Deletion				☠ → Ø / ___ s			
Diphthong Simplification C			V→Ø/V __ where /a/ = [+bk]	V→Ø/V __ where /a/ = [+bk]	V → Ø / V __ [+bk] [+bk] where /a/ = [+bk]		
Analogy			irma(s) (m) → irma☠(s)	irma (m.) → irma☠			
Gender Dissimilation			irma☠(s) (f.) → irma(s)				
Lexical Diffusion						Ø → C / one word at a time [+nas]	
EVALUATION	Accounts for Eastern Galician dialects, but not Western, Central, or NW East dialects.	Accounts for Eastern Galician dialects, but not Western, Central, or NW East dialects.	Adds denasalization of ão, resorts to complex set of rules including analogy and gender dissimilation to account for four lexical items ('brother', 'brothers', 'sister', 'sisters'). Makes wrong predictions for other words. Doesn't capture Galician dialect areas or observation that /N/ is spreading.			Accounts for Western, Central, NW East, and Eastern dialects; makes minimal changes to the accepted historical account.	

Shaded cells indicate the absence of a rule from a particular historical account. Split columns indicate a split into dialect areas.

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