PORTUGUESE VINHO: DIACHRONIC EVIDENCE FOR BIPHONEMIC NASAL VOWELS

by

JOHN M. LIPSKI Newark State College

A key problem in phonological analysis is the assigning of mono- or biphonemic status to a given sound or group of sounds; in particular, the analysis of nasal vowels has traditionally provided an interesting and controversial area of research. Analyzing the phonemic content or 'underlying form' of nasal vowels is rendered especially difficult in Portuguese by the relative paucity of morphophonemic alternations or other supporting evidence, such as is more readily available in languages like French. Although the majority of scholars investigating the Portuguese nasal vowels have concluded that a biphonemic analysis (i.e. as oral vowels plus nasal consonant) best accounts for the facts, the available data is by and large inconclusive, and has often been employed to yield entirely contradictory results.

In an excellent study, Morais-Barbosa² has based a biphonemic interpretation of the nasal vowels on various observable phonetic facts. Within the framework of generative grammar, a similar analysis has been proposed by Saciuk,³ based, however, on a rather untenable set of morphophonemic alternations. Other studies claiming biphonemic status for the Portuguese nasal vowels have used even less concrete evidence, relying on the intuition of native speakers as well as on historical data.

On the other hand, some investigators, notably Lüdtke,4 have argued

¹ An analysis of the French nasal vowels from the standpoint of generative phonology may be found in Sanford Schane, French Phonology and Morphology, Cambridge (1969), pp. 45-8.

² Jorge Morais-Barbosa, "Les voyelles nasales portugaises, interprétation phonologique." Proceedings of the 4th International Congress of the Phonetic Sciences (Helsinki 1961), pp. 691-708.

³ Bohdan Saciuk, "Some basic rules in Portuguese phonology." In Studies Presented to Robert B. Lees by His Students, ed. Saddock and Vanek, Edmonton (1970), pp. 197-222.

⁴ Helmut Lüdtke, "Fonemática portuguesa, II: vocalismo." Boletim de Filologia (Lisboa) 14 (1953) 197-217.

for the monophonemic status of the Portuguese nasal vowels on the basis of such virtual 'minimal triplets' as vi, vim, vime, since in the standard continental Portuguese dialects, the final e of words like vime is dropped, yielding a superficial contrast between a nasal vowel and an oral vowel followed by a nasal consonant in the same syllable (cf. French beau, bonne, bon). Brian Head⁵ has utilized similar criteria in positing a separate series of nasal vowel phonemes for both European and Brazilian Portuguese.

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What is lacking in synchronic studies such as the ones referred to above is some sort of tangible evidence that native speakers of Portuguese actually analyze nasal vowels as a sequence of oral vowel plus nasal consonant; in fact, such evidence is hard to come by and is controversial at best. Diachronically, however, there are some developments in Portuguese which strongly suggest that nasal vowels have been analyzed as a vowel plus consonant cluster. One such development is the evolution of n to nh $[\tilde{n}]$ between a (generally stressed) i and a following a or o. Compare:

LATIN	Portuguese	Spanish
vīnum līnum vīcīnus gallīna dīvīnare dēnārĭus	vinho linho vizinho galinha adivinhar dinheiro	SPANISH vino lino vecino gallina adivinar dinero
spīna	espinha	espina

Initially, some scholars labored under the mistaken impression that the shift from n to nh in words such as the ones above was a simple process of nasal assimilation. Thus Nunes (p. 35)6 says: 'a resonância nasal que acompanhava esta vogal, ou talvez o n que lhe andava junto, passou, por assimilação, de dental a palatal, como a mesma vogal'. Such a supposition, although suggestive, does not conform to the data, however, due to a problem of relative chronology. Intervocalic n was lost very early in Portuguese; Williams⁷ places the loss at around the 10th century, while the documents examined by Sletsjøe⁸ suggest a still earlier date. When intervocalic n fell, it nasalized the preceding (and later often by assimilation

the following) vowel, and this residual nasal resonance evidently persisted for several centuries after -n- had completely disappeared. The development of the palatal nh (which Bourciez⁹ refers to as 'transitoire') occurred several centuries later. Nunes10 maintains that the establishment of the palatal nasal was not effected until the end of the 13th century, while Williams¹¹ adduces evidence to show that this change had not yet occurred in the early part of the 14th century. It is evident, then, that we are not dealing with a simple case of nasal assimilation, since three centuries separate the loss of intervocalic n from the development of the palatal nh; and it therefore remains to be shown how the palatal nasal arose in the forms under consideration.

When intervocalic n fell in Portuguese, it left behind two vowels in hiatus, the first of which was nasalized. This fact is often indicated in the orthography of the old texts by examples such as:

 $v\bar{i}num > v\bar{i}o$ căminus > camio vicinum > vizio

Now it is a commonly observed fact that in Portuguese (as in many other languages), the high vowels i and u in hiatus with a following vowel tend to develop the transitory glide sounds [j] and [w], respectively. When the i or u is unstressed, it converts itself into the corresponding glide: $hi\bar{a}tus > 1$ hiato [játu], $r\bar{e}gŭla > r\acute{e}gua$ [régwe]. On the other hand, a stressed i or ufollowed in hiatus by another vowel tends to develop a 'transitional' glide element, due, no doubt, to the weakening of the release of the high vowels during the transition to the second element of the hiatus pair (since of course unstressed i in hiatus becomes [j] while unstressed u in hiatus reduces to [w]). This transitional sound is generally non-distinctive and hence liable to pass unnoticed in ordinary conversation. It may nonetheless be perceived by the trained ear, as well as by mechanical or electronic devices. Examples include dia [dí¹e], tia [tí¹e], lua [lúwe], sua [súwe]. 12 In particular,

⁵ Brian F. Head, "A comparison of the segmental phonology of Lisbon and Rio de Janeiro." Unpublished Ph.D. dissertation, The University of Texas (1964), pp. 65-78.

⁶ J. J. Nunes, "Nasalamento," Revista de Philologia e de Historia 1 (1931) 35-39.

⁷ Edwin B. Williams, From Latin to Portuguese, 2nd ed., Philadelphia (1962), pp. 70-71. 8 Leif Sletsjøe, Le Développement de I et n en Ancien Portugais, Oslo (1959).

⁹ Édouard Bourciez, Éléments de Linguistique Romane, 5th ed., Paris (1967), p. 402.

¹⁰ Nunes, op. cit. p. 37.

¹¹ Williams, op. cit. p. 71.

¹² Pronunciations such as [riju] for rio and [bówa] for boa are noted by Oskar Nobiling, "Die Nasalvokale im Portugiesischen," Die Neuren Sprachen 11 (1903) 129-53 (fn., pp. 401-2). Sometimes this transitional glide element became excessively prominent. Williams, op. cit. p. 50, indicates that some dialects evolved forms such as filum > fio > [fiju]. Occasionally this transitional glide figured prominently after mid vowels as well: tēlam > teia. arēnam > areia, etc.

such a transitional [i] would have immediately appeared in those forms in which an intervocalic n fell between an a or o. This phenomenon would yield the following configurations:

 $v\bar{i}num > v\bar{i}o [v\hat{i}^{j}o]$ cămīnus > camīo [kamfio] gallīna > galīa [galija] $p\bar{i}nus > p\bar{i}o [p\hat{i}^{j}o]$

The relevance of the above observations to the declared intent of this paper becomes immediately apparent when one stops to consider the other major source of vowel nasalization in Portuguese, nasalization before a tautosyllabic nasal consonant. This process is also of early origin, probably occurring at about the same time as the loss of intervocalic n. This second form of vowel nasalization began by nasalizing a vowel followed in the same syllable by a nasal consonant i.e. when the nasal consonant was followed either by another consonant or by a word boundary, with the nasal consonant subsequently being deleted. 14 In this fashion, word-internal sequences of VNC came to be realized as VC, while the word-final sequences -VN # became - $\tilde{\mathbf{V}}$ #.

The above-mentioned process of vowel nasalization may be considered completed by the beginning of the 14th century; that is to say that by the time of the 'shift' from -n- to -nh-, the sequences *-VNC- and *-VN# were non-existant, having been replaced by - \tilde{V} C- and - \tilde{V} #, respectively. What, then, can be the origin of the palatal nh which developed in the interior of such medieval Portuguese forms as vio, camio, etc.? Clearly we do not have a simple process of assimilation as Nunes believed, for otherwise we should expect either the oral forms *[víjo], *[kamíjo], etc., or nasal diphthongs like *[vīw], *[kamīw], etc., or perhaps oral diphthongs such as *[viw] or *[kamíw].15 Since none of these ordinary routes of development was in fact followed, it is evident that forms such as vio, pio, etc.

15 Note that similar forms in which hiatus did not result from loss of intervocalic n evolved in a different fashion: fīlum > fio, rīvum > rio, etc.

were somehow felt as being different from words resulting from the loss of intervocalic n in other environments. This difference of course was the presence, in the former class of words, of the glide element [j] between the nasalized vowel and the following vowel, for this glide caused the words in question to conform to the general pattern resulting from tautosyllabic vowel nasalization; i.e. to contain the sequence -VC-. Since the nasal consonants which were lost during this latter form of vowel nasalization were always homorganic with the following consonant, then if the sequences of -VC- were analyzed by Portuguese speakers as being phonemically /-VNC-/, the sequence -Vi- would be analyzed as resulting from the sequence /-Vñj-/. In other words, given the otherwise unexplainable emergence of the palatal nh in the class of words in question, it appears that the Portuguese speakers of this time period performed an analysis similar to the following:

vĩo [vijo] → /viñjo/ camĩo [kamíjo] → /kamiñjo/ pĩo [pijo] → /piñio/

The introduction of the graphy nh into the orthography follows from the fact that in the other cases where a tautosyllabic nasal consonant nasalized a vowel and subsequently fell, the nasal consonant was preserved in the orthography: cambio, contar, bom, etc. Thus the actual emergence of the palatalized nasal may have also been influenced by the orthography as well as by the general prenasalization of consonants after a nasalized vowel.¹⁶ A striking point in favor of such an interpretation lies in the fact that even today the nasalization of vowels preceding [ñ] has not disappeared.¹⁷ It has been the observation of the present writer that in Portuguese, nasalization of a vowel by a nasal consonant in the following syllable, while occurring sporadically throughout the language, is completely general before [n]. In fact, in many dialects of Portuguese, in particular the dialects

17 Williams, op. cit. p. 70, claims that in fact this nasal resonance disappeared. His remarks, however, are in contradiction with most other descriptions of the language. What Williams probably meant was that the nasality of the vowels followed by [ñ] ceased to be distinctive.

¹³ See Bourciez, op. cit. pp. 401-2.

¹⁴ Williams, op. cit. p. 90, and other more recent investigators have claimed that the nasal consonant was retained before a following stop, since the orthography usually indicates a nasal consonant homorganic with a following stop. What actually occurs, however, is not a retention of the nasal consonant, but rather a prenasalization of the following oral consonant. In fact, Head, op. cit. p. 189, has shown that this prenasalization occurs before the fricatives as well, although this is likely to go unnoticed since Portuguese has no phonemic nasal fricatives.

¹⁶ The emergence, in actual pronunciation, of the sound [ñ] in the words in question was rendered exceptionally easy by the previous existence in the language of a sound corresponding to the prenasalized version of the consonant following the nasal vowel (since the articulatory and acoustic differences between [ñi] and [ñi] are, of course, negligible). Thus, while Portuguese did not possess the phonemes */nd/, */mb/, etc., the phoneme /ñ/ was readily available and could be substituted for the prenasalized [ni] without difficulty.

of Brazil, the [ñ] often alternates with a glide [j], indicating not only that [ñ] is analyzed as biphonemic, but also that no firm decision has been reached as to the retention or deletion of the nasal element. Examples include:

tenho [tếnu] ~ [tếju] vinha [víne] ~ [víje]

It is interesting to note that, speaking of the retention of vowel nasalization before a nasal consonant (especially [ñ]), Nobiling¹⁸ remarks: 'Diese nasalirung geht zurück auf die noch heute bestehende neigung, das gaumensegel früher zu senken, als es für die artikulation des [m], [n], oder [ñ] nötig ist: eine neigung, die jedenfalls sehr alt ist, und auch die entstehung der zweiten gruppe nasaler vokale erklärt.'

As a further addition, one may consider those peculiar cases in Portuguese, where a nasal vowel arose by assimilation to a PRECEDING nasal consonant, sometimes even giving rise to a new consonant. For example, we have such developments as multum > muito > [mujtu], dialectal munto; mater > mai > [mẽ]; mesa > dialectal menza; noite giving dialectal note, etc. 19 It will be noticed that the nasal vowel in such words conforms to the surface patterns $\tilde{\mathbf{V}}\mathbf{C}$ or $\tilde{\mathbf{V}}$ # exhibited by the other fully nasalized vowels of the language, and thus it is possible that this phonotactic configuration was instrumental in preserving the nasalization. It is obvious, however, that such developments are quite sporadic, for otherwise we should expect every vowel in the environments NVC or NV # to become strongly nasalized, which is clearly not the case. It should be noted, nonetheless, that nasalization by a preceding nasal consonant did not take place when the vowel in question was not followed by either a consonantal segment or a word boundary; i.e., in an environment conforming to the general surface pattern of vowel nasalization. There is no attestation, for example, of strongly nasalized vowels in words like moagem, moeda, etc.

More relevant to the purpose of the present study are developments like: $m\bar{e}am > m\bar{i}a > minha$; 20 $n\bar{i}dum > *nio > n\bar{i}o > ninho$, etc. Here the nasality of

the initial consonant was not only carried over to the following vowel, but also gave rise to the palatal nasal under exactly the same circumstances as those leading to the development of forms like vinho. This peculiar ability of the high vowels, in particular i, to produce far-reaching effects during changes involving nasalization has been noted by Sletsjøe:²¹ 'Les voyelles nasales « pures » se trouvent dans cette langue devant des consonnes où l'élément spirantique joue un grand rôle. Justement, après les voyelles fermées i et u nous avons facilement un tel élément . . . Un indice de l'importance extraordinaire de cette voyelle [i.e. i] quand il s'agit de développer la nasalité, c'est que l'évolution a -inho a lieu même dans des cas où il n'y avait pas de -n- . . .'.

The importance of i in these circumstances has also been noted by J. Bourciez, 22 who gives, however, a more roundabout description than that of Sletsjøe, and who also bases his theory of the development of $[\tilde{n}]$ on the assertion that Portuguese does not tolerate intervocalic yod, a statement which is contradicted by words like teia, areia, etc. This same topic is also briefly touched on by Dámaso Alonso, 23 who is concerned, however, with other aspects of the history of -n- in Portuguese and Galician. In all the above cases, nevertheless, the most interesting and significant observation remains the fact that the palatal nasal arose in precisely those environments where the combination of a nasalized vowel plus a following glide element could be interpreted as a vowel followed by a nasal consonant.

One further development may be briefly mentioned at this point which, while not dealing directly with the phonemic interpretation of the nasal vowels, points out the role of the transitional glides which arise when the high vowels i and u occur in hiatus with a following vowel. The events in question concern the evolution in Portuguese of Latin words in -una. The intervocalic n of such words fell in accordance with the regular development of Portuguese. From this point, most of the words in question evolved in a parallel fashion, denasalizing the u and resulting in either a hiatus or in a diphthong: $l\bar{\alpha}c\bar{u}na > ldgoa$, $comm\bar{u}na > comua$, $l\bar{u}nam > lua$, etc.

¹⁸ Nobiling, op. cit. p. 140.

¹⁹ See, for example, J. J. Nunes, "Dialectos Algarvios," Revista Lusitana 7 (1902) 33-55 (esp. 43); J. Leite de Vasconcellos, "Dialectos Trasmontanos," Revista Lusitana 3 (1893) 57-64 (esp. 63); "Dialectos Alemtejanos," Revista Lusitana 2 (1890) 15-45, 4 (1896) 215-46; "Dialectos Algarvios," Revista Lusitana 4 (1896) 324-33.

²⁰ Cf. Italian, Spanish mia. Since these possessive forms are generally found in unstressed position before a following noun, it is most likely that the *i* of minha is an early case of the raising of unstressed *e* to *i*. A parallel development in the corresponding masculine form meu was evidently prevented when the final unstressed *u* became a glide, thus

forming a diphthong. It seems to be the case in Portuguese that the process of unstressed vowel raising was often checked when the vowel in question formed the first element of a diphthong; e.g., $f\tilde{a}\tilde{c}iles > f\tilde{a}ceis$ [fásejs]. As a further observation, it may be noted that in those Portuguese dialects where syllable-final l is vocalized to [w], the resulting diphthongs generally prevent the raising of unstressed vowels.

²¹ Sletsjøe, op. cit. pp. 203-4.

²² Jean Bourciez, "Note sur la résonance nasale des diphtongues accentuées du portugais," in Mélanges d'Études portugaises offerts à M. Georges Le Gentil, Lisbon (1949), 61-67 (66).

²³ Dámaso Alonso, "Gallego-Asturiano 'engalar' 'volar': casos y resultados de velarización de -N- en el dominio gallego." In *Homenaje a Fritz Krüger*, Mendoza, Argentina (1954), v. 2, pp. 209-215 (211).

In the case of Latin unam and its derivatives, however, a somewhat different development ensued, producing an intervocalic m: $\bar{u}nam > uma$, nec $\bar{u}nam >$ nenhuma, etc. Vising (p. 92)²⁴ declares simply that the development of intervocalic m in uma occurred 'unter Einfluss von um.' Williams²⁵ is a little more cautious when he says, speaking of the same development: 'It was brought about by the intensification and preservation of the nasal resonance in the earlier form $\tilde{u}a$ through the influence of the masculine form $um \, \lceil \tilde{u} \rceil$. While Williams' statement more accurately reflects the available data, there is still more to be said about this set of developments, since the mere presence in the language of um, while perhaps sufficient to account for the retention of nasalization in ũa, does not adequately account for the development of the intervocalic m in uma. It is here that the existence of the transitional glide elements may be called upon to aid in a possible explanation. In those words where the nasalized \tilde{u} in hiatus resulting from loss of intervocalic n was subsequently denasalized, this glide element remained only in transient and nondistinctive form: lua [lúwe], comua [komúwe], etc. The effect of this transitional element would have been different, however, in those forms in which the nasality of \tilde{u} remained, i.e. in the uma-class. The old form ũa [twa], while conforming in the strict sense of the word to the VC pattern established by tautosyllabic vowel nasalization, could not be readily analyzed as containing a biphonemic nasal vowel, as in the case of the development of nh, since there existed no nasal consonant which could be interpreted as ending in [w].26 An alternate solution, and the one which was evidently adopted (influenced perhaps, in the learned classes only, by the spelling of um) was to combine the nasality of \tilde{u} with a somewhat more closed [w], at which point an m was produced. The reader can easily verify for himself that the articulatory and acoustic differences between [uwa] and [uma] are minimal, and that the two forms easily merge in rapid conversation. Such vacillation may in fact be observed in various Portuguese dialects, thus pointing to the plausibility of this analysis.27

24 Johann Vising, "Bemerkungen zur Geschichte des intervokalen N im Portugiesischen," Revista da Universidade de Coimbra 11 (1922) 84-93.

25 Williams, op. cit. p. 72.

It is in fact the case that many Portuguese speakers currently pronounce the first syllable of *uma* without opening the lips, in which case an *m* is automatically produced upon release of the syllable.

In summary, it has been seen that a natural and plausible analysis of an otherwise unusual historical development in Portuguese may be realized by assuming that the speakers analyzed phonetic nasal vowels as phonemically consisting of a vowel plus a nasal consonant. This interpretation, as well as offering an explanation for several specific historic events, is also of importance to phonological theory in general, since it adds additional support to claims that speakers may, when necessary, perform 'abstract' phonological analyses. In addition, it has been pointed out that so-called 'transitional elements' arising on purely phonetic grounds may often play a decisive role in determining the form of phonological change.

Summary:

An unusual historical phenomenon, peculiar to Portuguese, is the development of a palatal nasal consonant after stressed i in hiatus where an n had previously fallen; e.g. $v\bar{\imath}num > v\bar{\imath}o > vinho$. It is claimed that this change was initiated by the presence of a 'transitional' glide element [j] which appeared after the high vowel i in hiatus. The combination of the nasalized vowel resulting from the previous loss of intervocalic n and the glide element [j] made the words in question conform to the surface pattern $\tilde{\mathbf{V}}\mathbf{C}$ which resulted from vowel nasalization by a tautosyllabic nasal consonant. Since the nasal consonant which had fallen in the latter cases was always homorganic with the following oral consonant, speakers analyzed the sequence $\tilde{\mathbf{V}}\mathbf{j}$ as containing the palatal nasal $[\tilde{n}]$. The presence of the transitional glide $[\mathbf{w}]$ after tonic u in hiatus is also analyzed as the prime factor behind the development of m in $uma < \text{Latin } \bar{u}nam$.

²⁶ Galician appears to have resolved this situation somewhat differently, by combining the nasal resonance of \tilde{u} together with the velar element of the labiovelar [w] to form a velar nasal consonant: $\tilde{u}nam > \tilde{u}a > unha$ [una]. Cf. Nobiling, op. cit. p. 148.

²⁷ Williams, op. cit. p. 73, cites the evolution $l\bar{u}nam > l\bar{u}a > luma$ in certain Portuguese dialects, thus hinting that this process may at one time have been more general. In most cases, however, it was only the reflex of Latin $\bar{u}nam$ which was so altered in Portuguese and Galician. The reasons for this preferential treatment are not particularly clear, and I hope to have a longer study on this particular problem completed soon. In general, it appears that the development of $\bar{u}nam$ in Portuguese and Galician is due to

the interlocking results of a number of discrete factors. These include the existence of the corresponding masculine form um (pronounced [un] in Galician), the fact that it was the high vowel u in hiatus, and the combinatory properties of the articles, which enable them to form a nexus with a following word.