

UNIVERSALS OF NASAL ATTRITION

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ABSTRACT

The claim that there is a hierarchy governing the attrition of nasals according to place of articulation is put to the test in this paper by examination of cross-linguistic data from two language groups which are unrelated genetically and geographically: the Romance dialects of Northern Italy and the Lower Cross group of South-Eastern Nigeria. Results of this new survey provide interesting food for thought: developments in the Northern Italian dialects support, to a large extent, predictions that follow from phonetic considerations. However, the Lower Cross languages at first appear to contradict expectations. This suggests that other factors may need to be taken account of, before a true universal tendency, if one exists, can be established.

1. UNIVERSAL TENDENCIES OF VN SEQUENCES

There have been numerous studies of the diachronic development of both vowels and nasals in VN sequences, e.g. [1, 4, 7, 8, 9, 11]. As a result, many generalizations have been made with purported universal or quasi-universal effect. With reference to the distinctive nasalization of vowels, we note such claims as: (1) nasalization affects low vowels first, before spreading to higher vowels; (2) front vowels are nasalized before back vowels of similar height; (3) stressed vowels are nasalized before unstressed vowels. As for nasal consonants, it has been variously claimed that: (1) nasal consonants are preferentially deleted when in tautosyllabic rather than in heterosyllabic position; and (2) weakening and deletion

of N, i.e. N-attrition, occurs first in word-final position before spreading to N+C clusters. The particular claim we wish to examine here is the suggestion that the development of N-attrition is universally governed by, among other things, a parameter of place of articulation, i.e., that N-attrition will predictably affect one place of articulation before spreading in a determinable fashion to other places of articulation. Of special interest is the fact that opinions conflict as to the precise nature of this place of articulation parameter. Chen [1] states explicitly that N-attrition and nasalization of the preceding vowel affects anterior nasals [m, n] before spreading to posterior [ŋ]. Some fine-tuning of Chen's claim can be made, since it is also obvious in the diagrammatic formalizations he presents of relative backness and of nasalization processes in Chinese dialects, that he expects N-attrition and subsequent distinctive vowel nasalization to affect /Vm/ sequences before spreading to /Vn/ and then finally to /Vŋ/. Chen claims that historical developments in a sample of Chinese dialects support his observations.

Hombert [7, 8] in an analysis of the historical development of nasal consonants and N+C clusters in the Teke languages (Bantu B70) of Central Africa agrees that vowel nasalization and N-attrition affect /Vm/ (< Proto-Bantu */Vm/, */Vmb/) before /Vn/ (< */Vn/, */Vnd/). However, Hombert [7] also notes that the velar nasal in /Vŋ/ (< */ŋg/) is frequently deleted, but without evidence of expected vowel nasalization. To account for the apparently anomalous behaviour of the velar nasal, he can make only the unsatisfying suggestion that loss

of /ŋ/ is an independent and unrelated phenomenon.

In contrast to Chen and Hombert, Foley [4] suggests that the order of any place of articulation parameter of N-attrition is reversed: N-attrition affects the velar nasal preferentially, before spreading along the parameter to affect /n/ and only then to /m/, i.e., $\eta > n > m$; cf. also Lightner [9]. Historical developments in Portuguese, and German are cited as exemplifying the suggested directionality of the parameter.

We wish to constrain possible scenarios of sound change by providing phonetic explanations for them. Given this approach, it appears at the outset that Foley and Lightner's parameter of N-attrition is perhaps the most plausible, since it is most consistent with the phonetic observations of Ohala [10] who notes (p.297) that, "the alternation [ŋ] ~ \tilde{V} should be more common than the alternation of other nasals with \tilde{V} ", as suggested by perceptual experiments. This is explained (following House 1957), "by noting that the velar nasal has primarily just a single resonating cavity with a small, perhaps negligible side-cavity, unlike other nasals, and thus negligible anti-resonances with large bandwidths and is more like that of a nasalized vowel than are those of any other nasal." Following from this, "is the prediction that of all nasal consonants one would expect [ŋ] to be most prone to change or deletion. Insofar as the zero of [ŋ] is situated in the more attenuated higher frequencies, it is less perceptible than the zeroes of other nasals, and thus make [sic] [ŋ] just that much less of a nasal."

However, while there are good phonetic reasons to claim that [ŋ] is inherently weak and most prone to loss, Ohala's prediction as to the inherent phonetic propensity of [ŋ] towards attrition is apparently not entirely borne out by cross-linguistic data. The extremely limited sets of data used by Foley [4] and Lightner [9], do concur; on the other hand, Chen's work cited earlier claims that [m, n] are weaker than [ŋ], while Hombert's suggests that devising a place hierarchy may not be such a

straightforward matter as was at first thought. The apparent contradiction in data may be the result of intervening elements such as: (1) poor methodology and interpretation of data; and (2) language-specific factors that may have an over-riding effect on the expected operation of universal factors normally governing N-attrition. In order to distinguish between language-specific factors, still to be ascertained, and universal factors, an examination of developments in languages other than the small set of languages referred to above may cast some light on the purportedly universal nature of N-attrition.

2. NORTHERN ITALIAN

We have examined in detail the diachronic development of nasal consonants from Latin to the present day in a sample of Northern Italian dialects. While Latin final consonants were lost after the Classical period, the loss of final atonic vowels, combined with the rise of /ɲ/ (< L. Lat. /nj/), resulted in a new set of permissible final consonants, and a three-way contrast in final nasals: /m, n, ɲ/, cf. the limited set of examples in Fig. 1.

Latin	balneu	cane	fame
Proto-N.I	*/baɲ/	*/kaɲ/	*/faɲ/
Imolese	[be:ɲ]	[kɛ:]	[fɛ:m]
Lughese	[ba:p]	[kɛ:]	[fɛ:m]
Bolognese	[ba:ɲ]	[kæŋ]	[fa:m]
Riminense	[ba:ɲ]	[kɛ:n]	[fɛ:mə]
Bergamese	[baɲ]	[ka:]	[fam]
Milanese	[baɲ]	[kã:]	[fam]
Cairese	[baɲ]	[kaɲ]	[fam]
Tavetsch	[boɲ]	[cawn]	[fom]
gloss	bath	dog	hunger

Fig.1: Developments of PNI /ɲ/, *n, *m/.

Despite appearances, loss of word-final /n/, and related distinctive vowel nasalization are historical phenomena in Bolognese and Cairese. The presence of velar [ŋ] in place of historical word-final /n/ in Bolognese and Cairese is a recent development and, for reasons not given here, is not evidence of place shift from alveolar to velar, but is the result of a process of consonantization

of nasalized glides that developed subsequently to the deletion of word-final /n/, cf. Hajek [4, 5].

It is evident that in Northern Italian dialects, [n] is significantly more prone to N-attrition than either [m] or [ŋ]. Attrition of final [ŋ] is completely unknown in our sample, while loss of final [m] is recorded very sporadically in Imolese and Lughese. For historical reasons we can make no conjectures about the place of [ŋ] along any place of articulation parameter. However, developments in Northern Italian indicate the following order for the other nasals:

$n > m > \eta$. The suggested phonetic explanation for such an ordering in Northern Italian is based on duration measurements of nasal consonants in various Romance languages which correlate with diachronic developments concerning N-attrition in Northern Italian: temporally shorter nasals (i.e. [n]) are more prone to reduction and loss than longer nasals (i.e. [m], and in particular [ŋ]), cf. Hajek [6]. With regard to the relative ordering of [ŋ] and [m], developments in Northern Italian support Foley and Lightner's suggested parameter.

3. LOWER CROSS

Nineteen languages have been identified in the Lower Cross group (Connell [2, 3]), a sub-branch of Benue-Congo situated in S-E Nigeria. Across the group, a common inventory of possible consonants in final (pre-pausal) position exists: /b d k m n ŋ/. Among certain languages of the group there is a strong tendency towards final consonant attrition, and while this has affected the different languages to varying degrees, broadly speaking, the group may be divided into two camps: those that have retained and those that are losing final Cs. While we focus here only on nasals, there seems to be little difference between oral and nasal consonants with regard to a possible place of articulation hierarchy regarding attrition, though it seems that oral consonants disappear at a faster rate than nasals.

To date only a preliminary analysis has been conducted; this, though, is sufficient to determine certain broad

trends. For this, a set of 200 words was used for comparison across the group. Table One gives figures for a representative selection of languages in the group which reflect the extent of final N-attrition across the group according to place of articulation. Figures given are a count of the number of instances of final nasals found in the 200-wordlist for each language.

	m	n	ŋ
Anaang	24	20	33
Ibibio	20	21	32
Ibino	18	16	28
Ebughu	8	7	30
Ekit	9	5	27
Oro	8	3	24

Table 1: Final-N retention in LC.

These figures show clearly that [ŋ], contrary to prediction, is the 'survivor', while both [m] and [n] appear to go at approximately the same rate (only Oro does [n] appear to be going faster than [m]). It is not surprising, given that the side-cavity for [m] and [n] are closer in size to each other than either is to that of [ŋ], that these two should behave in a similar manner; however since the phonetic structure of these consonants does seem to be playing some role in their attrition, it is not clear why other expectations do not obtain. One hypothesis is that [ŋ] is produced with greater nasal airflow, making it perceptually stronger. Preliminary aerometric investigation of Ibibio supports the claim that [ŋ] is produced with greater nasal airflow, and this may be the case across the group.

Further insight into the attrition of nasals can be gleaned in examining this phenomenon in LC in other than final position. The same three nasals occur in what may be referred to as ambisyllabic position, and while there is no strong evidence for complete loss of consonants differentially across the group, there is a strong tendency for consonants to weaken in this position. This weakening is to a large extent governed by speech rate and style, with greater reduction apparently occurring in faster and more casual styles.

In this ambisyllabic position, however, the opposite tendency to that of final position is found; i.e., /ŋ/ reduces more than either of /m/ or /n/. Typical realizations of the latter two in this position are as tapped stops, [m̥, n̥], whereas /ŋ/ is often a nasalized approximant [ŋ̃] or may even be deleted. This we consider to be an articulatory phenomenon, rather than acoustic; i.e., the articulation of /ŋ/, being achieved with the tongue dorsum, will be more affected by consonant/vowel coarticulation than either of /m/ or /n/.

4. CONCLUSIONS

Work reported here has attempted to clarify some of the phonetic factors that may be involved in the attrition of nasals. It is obvious both from previous studies and from our own work that attempting to account for this phenomenon simply in terms of a place of articulation hierarchy will not work, and that other factors need also to be considered. Among those identified in the present work are the relative durations of the consonants in question, their position within the word, and possibly the degree of nasality. It is also apparent that where /ŋ/ disappears more readily than other nasals, this may be due to articulatory, rather than acoustic, considerations. Regarding a place of articulation hierarchy, once other considerations, such as the role of duration in Northern Italian, have been taken into account, it appears that differentiating between [m, n] on one hand, and [ŋ] on the other, is the most that can be done at this point.

5. REFERENCES

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