EPENTHETIC NASALS IN THE HISTORICAL PHONOLOGY OF HINDI

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ABSTRACT

We demonstrate the plausibility of a postulated historical process whereby an epenthetic nasal consonant appeared between a sequence of nasal vowel + voiced stop (but not if the stop was voiceless) by showing that the same process occurs phonetically in present-day Hindi and French pronunciation.

1. INTRODUCTION

Modern Hindi (MH) words such as [d̪aːʈ] “tooth” vs [t̪aːʈ] “moon” present an interesting asymmetry in their phonological history: in their development from Middle Indo-Aryan (MIA) to Old Hindi (OH) and then to New IA both were subject to cluster simplification with compensatory lengthening and nasalization of the preceding vowel [1, 4]. Thus: Škt danta > MIA danda > OH date > MH [d̪aːʈ]; Škt tendra > MIA canda > OH āda > MH [t̪aːʈ]. [6] (Historical forms are given in conventional transliteration; modern forms in IPA where [ə] is inherently long.) In the latter example the nasal consonant, present in MIA but then subsequently lost, re-appears in MH. Is it plausible that a nasal be re-introduced only after a voiced stop or should we re-think the historical derivation of such words? The primary evidence that the nasal was indeed lost by the time of OH is the fact of compensatory lengthening of the vowel which in numerous other instances correlates

...with simplification of medial consonant clusters or geminates, e.g. Škt hasti “elephant” > Prakrit hathi > MH [hɔːʈʰi]. We present phonetic evidence in support of the scenario that a nasal consonant (N) could have been re-introduced preferentially between a nasalized vowel (V) and a following voiced stop (D) but not a following voiceless stop (T).

In an earlier exploratory study of Hindi we found that in the transition between a word final distinctively nasal vowel and a following word initial voiced stop, the initial part of the voiced stop became a nasal consonant. For example, the Hindi utterance /ək mə dol/ (literally “one ‘I’ give” nasally [ək mə dol]). Here it seemed clear that the nasal consonant formed out of the first part of the voiced stop was not lexical and was purely a product of low-level phonetic interaction between cross-word boundary segments. If verified, shown not to occur with V + T sequences, and found in other languages too, then this epenthetic nasal would constitute a plausible parallel to the posited diachronic scenario which requires the creation of a N out of a sequence of V + D.

2. AN INSTRUMENTAL STUDY

2.1 Methods

To obtain an indication of velar movement in speech in a non-invasive way we used a nasal olive [10] which gives a rough measure of nasal air flow, itself an approximate measure of velar opening. The nasal olive records air pressure behind one blocked nostril, the other nostril remaining open. This technique also permits a high-quality audio recording of the speech to be made simultaneously. Our subjects were two native speakers, each, of Hindi and French; for both languages there was one male and one female speaker. The first author was the female Hindi speaker. The subjects read a list of sentences in their respective languages which included sequences of word-final V followed immediately by word-initial D or T, as well as control utterances.

2.2 Results

The nasal olive was quite sensitive and picked up nasal microphonics in addition to the DC pressure variations that would be more directly indicative of velar opening. Some nasal microphonics may be present even when the velum is closed; the acoustic transparency of the velum to low frequencies is well-known [2, 3].

...Simultaneous audio recording of the speech to the output of the microphone is presented in Fig. 1. The nasalized nasal alveolar /m/ which gives a rough estimate of velar opening. The nasal olive records air pressure behind one blocked nostril, the other nostril remaining open. This technique also permits a high-quality audio recording of the speech to be made simultaneously. Our subjects were two native speakers, each, of Hindi and French; for both languages there was one male and one female speaker. The first author was the female Hindi speaker. The subjects read a list of sentences in their respective languages which included sequences of word-final V followed immediately by word-initial D or T, as well as control utterances.

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"phonetic" nasal can become phonologized (to use Jakobson's term) if listeners reinterpret this as an intended part of the pronunciation and not a predictable and thus discountable feature [5].

The phonetic and phonological literature on other languages reveals that voiced stops (but not voiceless ones) may tolerate nasal onsets when in contact with a preceding nasal segment (or occasionally even when there is no preceding nasal environment)[7, 8, 9, 11, 12]. If one accepts phonologies permitting a voiceless nasal, that would imply that both their initial portion to be nasal as well as closure near the onset of the stop closure were delayed. It should be mentioned that the reason for selecting Hindi and French for this study is simply the fact that both their phonologies permit V → D sequences spanning a word boundary. It is just a coincidence that it is also the history of Hindi which exemplifies the puzzle we were trying to solve. If one accepts that there are universal and timeless phonetic factors which cause variation and change in pronunciation (which may lead to sound change through phonologization), then the parallels to phonetically-based sound changes should be evident, potentially, in any spoken language which exhibits the appropriate conditions.

4. REFERENCES