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Nasal Substitution in Malagasy

0. Introduction

With the exception of a few high-frequency irregulars, most verbs in Malagasy begin with either *ma-* or *mi-*. The *mi*-initial verbs (e.g., *miten* 'speak') seem to be composed straightforwardly of a prefix /mi-/ followed by the verbal stem. With the *ma*-initial verbs things are a bit more complicated. In this paper I will show that for the majority of such verbs, a /maN-/ prefix is attached whose final nasal segment can, under certain conditions, coalesce with a following obstruent (a process referred to as "nasal substitution"). In §1 and §2 I will outline the relevant data and present an analysis that accounts for the cases in which nasal substitution fails to apply. The final section discusses exceptional cases and problems for my analysis.

1. Nasal substitution: the basic facts

Evidence of nasal subsitution can be found in verbs that are *ma*-initial. In most such verbs, the segment following the *ma-* is a nasal:

(1)

(a)	mandaka	'kick'
(b)	manduru	'burn'
(c)	mambuli	'cultivate'
(d)	manuratra	'write'
(e)	manapakevtr	'decide'
(f)	mamaki	'read'

In (a-c), it looks like the prefix is /maN-/, with the nasal assimilating to the first consonant of the stem. In (d-f), however, it is not clear what is driving the [m]~[n] alternations. To explain this, we must look at the unprefixed stems. Luckily, the definite

imperative (an imperative form used with a definite object) is missing the prefix in question, and thus reveals the stem-initial consonant. The examples in (1) are repeated in (2), with the definite imperative form provided for each.

(2)

	present	def. imperative	English
(a)	mandaka	dakau	'kick'
(b)	manduru	durui	'burn'
(c)	mambuli	[buli][1]	'cultivate'
(d)	manuratra	suratu	'write'
(e)	mamaki	vakju	'read'

Now it's clear what's happening. In (d-e), the prefix-final nasal adopts the place of the stem-initial obstruent, while the obstruent itself is deleted. This can be represented either as assimilation followed by deletion, or as a coalescence of two underlying segments.

One puzzle immediately presents itself, however—why does nasal substitution apply in (d-e), and not in (a-c)? The answer lies in the difference between the stem-initial consonants in each group. If the stem begins with a stop, the nasal assimilates to the stop, but no coalescence takes place. If it begins with a fricative, nasal substitution is the result. This is probably driven by a coda condition in the language that restricts coda consonants to nasals that are homorganic to a following stop. Nasals are apparently not able to share a place feature with a fricative, and so when a nasal-fricative cluster would be created by the morphology, nasal substitution steps in to repair the coda condition violation. Interestingly, when the stem begins with a liquid (which would also create an illegal cluster), a different repair strategy is used, as shown in (3):

[1] I'm guessing at what this would be; I'm fairly confident that at least the stem begins with [b].

(3)

	present	stem[2]	English
(a)	mandre	/re/	'hear'
(b)	mandefa	/lefa/	'send'

In these cases, rather than fuse the nasal and the liquid, the liquid is turned into a stop with the same place (orthographic *dr* represents the rhotacized alveolar stop [d^r]). This solves the coda condition violation, but raises another question: why doesn't the grammar use nasal substitution in the liquid cases? In other words, why not use the same solution for every violation of the constraint? The next section presents a tentative OT analysis in an attempt to answer this question.

2. The failure of nasal substitution: an OT account

It may be that the grammar prefers to retain a segment (even if its features are changed) over coalescing it with another segment—in OT terms, MAX outranks both UNIFORMITY (the anti-fusion constraint) and IDENT-IO. Thus, when faced with an illegal cluster like [ns] or [nr], the ideal solution is to change the second consonant into a stop, resulting in a legal cluster. However, this strategy is subject to the condition that the offending consonant can only be changed into something phonetically similar. The [r] → [d^r] change, in phonetic terms, is probably not large—I can attest that the difference is not very salient. The [l] → [d] difference may be greater, but there also may be crucial similarities in, say, the transitions into the following vowel. In contrast, the fricatives have phonetic characteristics quite different from the stops, and an [s] → [d] change may simply be too radical, forcing the grammar to an alternative strategy—nasal substitution.

[2] These stems are conjecture on my part, but plausible, on the basis of alternate forms of each verb, such as *mare* 'hear' and *nalefa* 'sent' (the latter is the form used to mark VSO order).

This similarity must crucially be measured in phonetic terms; with respect to features, fricatives are closer to stops (differing only in [cont]) than are liquids (differing from stops in [son] and [cont], at least). The difference we need might be formalized with *MAP constraints, which are constructed from the P-map. In other words, *MAP(CorFric, CorStop) >> *MAP(CorLiq, CorStop). These *MAP constraints, since they refer to phonetic similarity, must refer to output-output relations between a /maN-/ prefixed form and another unprefixed form in the paradigm (e.g. the definite imperative). The tableaux below demonstrate the three constraint strata that are necessary to capture the Malagasy repair strategies. Note that in order to simplify the tableaux, candidates that violate the undominated MAX-C (i.e. those that delete one of the consonants in the cluster) are omitted. Subscripts indicate correspondence relations, where relevant.

(4) Fricative-initial stem

/maN$_1$+s$_2$uratu/	*MAP (CORFRIC, CORSTOP)	CODA COND	IDENT-IO (SON)	UNIFORMITY	IDENT-IO (CONT)	*MAP (CORLIQ, CORSTOP)
(a) ☞ man$_{1,2}$uratra			*	*	*	
(b) mansuratra		*!				
(c) mand$_2$uratra	*!				*	

(5) Liquid-initial stem

/maN$_1$+r$_2$e/	*MAP (CORFRIC, CORSTOP)	CODA COND	IDENT-IO (SON)	UNIFORMITY	IDENT-IO(CONT)	*MAP (CORLIQ, CORSTOP)
(a) ☞ man$_1$d$^r{}_2$e						*
(b) man$_{1,2}$e				*!	*	
(c) manre		*!				

3. Residual issues and problems

There are still several verbs left unexplained, which fall into two groups: those in which no nasal follows the initial *ma-*, and those in which nasal substitution seems to

occur with stop-initial stems. Let us deal with each in turn. First, examples of the "no nasal" type:

(6) Verbs with no nasal in prefix

	present	def. imperative	English
(a)	maandru	andraui	'cook'
(b)	maazu	??	'understand'
(c)	majita	??	'see'
(d)	maturi	n/a	'sleep'
(e)	mare	rean	'hear'

The cases in (a) and (b) look like vowel-initial stems. Why is there no nasal, when having one would not result in a violation of the coda condition? We could try to argue that in fact these stems are *h*-initial, and that there is an [h] between the two vowels which we simply haven't detected. Prefixing /maN-/ to such a stem would perhaps rule out nasal substitution, since the [h] is placeless, thus forcing deletion of the nasal. However, this idea is less plausible with (c) (unless we further stipulate that nasal-glide substitution is impossible), and completely breaks down with (d) and (e), which should surface as *manduri* and *mandre*, respectively. In fact, *mare* 'hear' looks suspiciously like it uses the same stem as *mandre* 'hear'. The examples in (6) force us to posit a separate /ma-/ prefix that occurs with some verbs, while /maN-/ occurs with others.

The other type of exception is not so easily dealt with. These are cases like *manao* 'do'. When we look at the (past) VSO form of this verb, *natao*, it seems likely that the stem is /tao/. Nasal substitution applies here to a nasal-stop cluster, which we saw earlier was tolerated in words like *mandaka* 'kick'. The other two stop-initial substituters I've found are *nametraka* 'put' (cf. VSO form *napetraki*), and *manova* 'do' (cf. def. imp. *atov*; unsure of the status of the initial vowel). Although I don't have an account of why these verbs are different, I can think of two ways to distinguish them from the non-substituters.

First, ‘do’ and ‘put’ are extremely high-frequency compared to words like ‘kick’ and ‘burn’, and so might be expected to exhibit irregular behavior. Second, and more promisingly, all of the substituters have stems that begin with voiceless stops (*traka, petraki, tov*), while the non-substituters begin with voiced stops (*daka, duru, buli*). It may be that the grammar’s willingness to coalesce the voiceless stops is a manifestation of the *NC̥ constraint banning post-nasal voiceless obstruents. Of course there are several holes in this story; why not simply voice the stop, since post-nasal voicing does seem to operate in the language. In addition, it would seem that nasal substitution results in the stop (or at least its correspondent) becoming voiced anyway—it would seem cheaper to just voice it and avoid a UNIFORMITY violation. Further work on this problem must await more extensive data.