1. Introduction. This paper discusses the historical development of a rule deleting nasals in the OluTsootso dialect of (Olu)Luhya, a Bantu language of Kenya. The discussion is based largely on evidence from internally reconstructed historical developments, although the comparative data from Guthrie (1971, passim) is also cited. I shall first establish the relative chronology of certain nasal interactions and other sound changes. I shall then trace the extension of the rule of nasal deletion to certain roots, and demonstrate that this extension is a relatively recent development. We shall find that the rule is now conditioned partly in terms of morphological categories; its failure to apply in one such category (for certain roots) leads to an interesting discussion and hypothesis concerning the theory of markedness. The extension of this rule into Swahili loan words leads to certain complications which are discussed. Finally, a summary of the findings is presented in an historical scenario describing the diachronic development of the nasal deletion rule vis-a-vis other historical rules.

2.1. The rule of nasal deletion applies regularly and without exception when the voiceless fricatives /ʃ,s,ʃ/, and /x/ follow nasal prefixes:

/iN-fula/ → ifula 'rain'
/N-fiimb-a/ → fiimbá 'Cover me'
/tsiN-siche/ → tsisiche 'locusts'
/eN-seen-ng-a/ → eseenaanga 'I trample'
/N-shi-e-shi-no/ → shieshino 'It (class 7) is it'
/N-xa-a-xa-no/ → xaaxano 'It (cl.12) is it'

There is some evidence from internal reconstruction showing that these fricatives may not be original proto-consonants. Archaic forms and synchronic phonotactics suggest that these elements were derived from stops, and there is corroborating evidence from Guthrie (1971, passim) who does not postulate these fricatives for the proto language. Obviously, therefore, nasal deletion could not have existed at the proto-stage in its present form. We can assume that fairly soon after the proto-stage, these consonants did appear, and that the nasal deletion process then applied. This is supported by the fact that the rule is completely regular when these consonants follow nasals, having had time to work through the language completely. This will
contrast with the circumstances surrounding certain other consonants and
nasal deletion, which are discussed below.

3.1. We shall next consider h-initial roots when prefixed by nasals. The
following h-initial roots surface as b-initial when a nasal precedes:

/N-heeng-a/ → mbeenga 'Look at me'
/eN-hon-ng-i-a/ → emboniinja 'I save'
/N-huuts-a/ → mbuutsá 'Fan me.'
/iN-halaBa/ → imbalaBa 'Brave (cl.9)'

Since a h->b/N rule does not seem very plausible on phonetic grounds,
one would immediately look to the historical situation for an explanation. A
likely candidate for the historical root-initial segment of these roots would
seem to be *p, since a rule of nasal voicing (which still exists) would produce
b when a nasal precedes. The synchronic phonotactics support this proposal,
because p is found in relatively few forms, having a very low functional load,
while h is not so limited. Thus *p as the historical source of b is motivated
by the evidence from internal reconstruction fairly well. 6

3.2. However, what can also happen is that nasal prefixes are deleted before
h-initial roots, as the following examples show:

/N-heeng-a/ → heenga 'Look at me'
/eN-haamb-ng-a/ → gehaambaanga 'I catch
/N-hey-el-a/ → heyela 'Adultrate for me'
/N-ha-a-ha-no/ → haahano 'It (cl.16) is it'

Nasal deletion may apply whenever N precedes h, while the h->b/N rule may
apply except when homophony would result 7. In most cases, then, either rule
could apply when nasals precede h.

3.3. This situation finds a natural historical explanation if we consider
the following points:

(a) h, a fricative element, would naturally be expected to condition
nasal deletion, which regularly applies when other (voiceless) fricatives
follow nasals;

(b) On the other hand, historical *p would not be expected to condition
nasal deletion in OluTsotso 8, since *p is a non-continuant element. It is
only after *p became h that nasal deletion could logically be expected to apply;

(c) forms with mb from /N-h/ are then residues from an older situation
in which \( ^*p \) alternated with \( b \) after a nasal.

(d) Note that this development (in which nasal deletion optionally applies when \( h \)-initial roots follow nasals) differs from the situation discussed in section 2.1., where the voiceless fricatives regularly condition nasal deletion. Since we have assumed that the creation of the voiceless fricatives occurred fairly soon after the proto-stage because of the regularity of nasal deletion, we can now reason that the change of \( ^*p \) to \( h \) must have occurred later than the creation of \( s, s, sh, \) and \( x \). This would explain why a fair number of \( mb \) forms (from \( /N-h/ \)) exist, whereas only one relic form of this type can be found involving a nasal prefix and a voiceless fricative (cf. footnote 5).

Thus, forms in which the nasals are deleted must be more modern than forms in which \( mb \) surfaces from synchronic \( /N-h/ \). The above evidence shows that the rule of nasal deletion must have been extended to these \( h \)-initial roots after the change of \( ^*p \) to \( h \).

4. In this section I will discuss the evidence that the rule of nasal deletion is being extended to apply when nasals precede \( y \) and \( r \)-initial roots. For the purposes of exposition, I shall discuss first the nasal interactions for each group of roots.

4.1. When \( y \)-initial roots are preceded by nasals, surface \( nz \) or \( n \) may appear, as in the following:

\[
\begin{align*}
/N-yofu/ & \quad \rightarrow \text{inzofu} & \text{elephant} \\
/tsiN-yuundo/ & \quad \rightarrow \text{tsiinuundo} & \text{hammers} \\
/iN-yiinda/ & \quad \rightarrow \text{iiniinda} & \text{rich(cl.9)} \\
/eN-yaBil-ng-a/ & \quad \rightarrow \text{enzaBilaanga} & \text{I bury} \\
/N-yoomb-a'/ & \quad \rightarrow \text{nomboB} & \text{Surpass me} \\
\end{align*}
\]

As the above examples suggest, \( n \) appears when a nasal cluster is in the syllable following \( y \); otherwise, \( nz \) appears when a nasal prefix precedes.\(^7\)

4.2. When \( r \)-initial roots are preceded by a nasal, a rule of nasal hardening may apply, and \( r \) becomes \( d \):

\[
\begin{align*}
/N-raNu/ & \quad \rightarrow \text{indaBu} & \text{pot} \\
/tsiN-rutsu/ & \quad \rightarrow \text{tsiindutsu} & \text{eagles} \\
/iN-rechelefu/ & \quad \rightarrow \text{indechelefu} & \text{attentive(cl.9)} \\
/eN-rem-ng-a/ & \quad \rightarrow \text{endemaanga} & \text{I cut} \\
/N-ri-i-s-i-a/ & \quad \rightarrow \text{ndiisia} & \text{Frighten me} \\
\end{align*}
\]
However, what may also happen is that the rule of nasal deletion may apply in cases where y and r-initial roots follow nasal prefixes:

(a) y-initial roots:

/iN-yiinda/ → iyinda 'rich (cl.9)'
/tsiN-yu/ → tsiiyu 'warm (cl.10)'
/eN-yaBil-ng-a/ → eyaBilaanga 'I bury'
/N-yoomb-á/ → yoomba 'Surpass me'

(b) r-initial roots:

/iN-rechelefu/ → irechelefu 'attentive (cl.9)'
/tsiN-raambi/ → tsiiraambi 'tall (cl.10)'
/eN-rem-ng-a/ → eremaanga 'I cut'
/N-ri-i-s-i-á/ → riisí'á 'Frighten me'

4.4. Once again the question arises as to the relative antiquity of the nasal processes. It will be the purpose of the following sections to determine this, relying heavily on evidence from internal reconstruction. In section 4.4.1, y-initial roots will be discussed; r-initial roots are examined in section 4.4.2.

4.4.1. As I hope to have shown elsewhere (Dalgish 1974, 1975a), the nz/n alternations found when nasals precede y-initial roots parallel the nasal interactions appearing when vowel-initial roots are preceded by a nasal. The nasal of a nasal prefix appears as n before vowel-initial roots if the first syllable of the root contains a nasal or nasal cluster; elsewhere it appears as nz. It is therefore logical to assume that these y-initial and vowel-initial roots had a common ancestor, *y, and that vowel-initial roots have lost the initial consonant. Now, if both groups of roots descended from *y-initial roots, the rules producing nz/n from /N-*/ must have existed prior to the rule of *y-loss. This is simply because *y is the only segment which would have produced the nz/n forms. After the rule of *y-loss, some roots then continued as y-initial, and others became vowel-initial, while nz/n alternations continued for both groups of roots when preceded by a nasal.

The rules producing nz/n thus applied historically prior to the rule of *y-loss, prior to the development of phonemically distinct y-initial and vowel-initial roots, and thus apply to both types of roots. On the other hand, nasal deletion applies only when y-initial roots follow nasal prefixes, and never when vowel-initial roots follow nasals. This development can easily be
explained if we propose that the rule of $\ast_y$-loss applied before the rule of nasal deletion began to affect nasals preceding $y$-initial roots. Thus, the nasal deletion process (conditioned by $y$) is a more modern development than the nasal interaction rules producing $nz/\_n$.

4.4.2. The evidence from nasal interactions with $r$-initial roots indicates that nasal deletion is a more recent development. We have seen that surface $nd$ appears from $/N-r/$ as the consequence of nasal hardening. Note, however, that surface $nd$: can also be from underlying $/N-t/$ as the consequence of a nasal voicing process, widely attested in Bantu, and still found in Olutsootso. From this it can be inferred that $r$ is historically from $*t$, and that surface $nd$ forms might be from earlier $*/N-t/$. Note that this parallels the development of $h$-initial roots, in that a voiced stop ($b$ or $d$) is retained after a nasal, while the original segment ($*p$ or $*t$) has undergone a sound shift.

4.5. Thus, the forms with surface nasal clusters from underlying $/N-h/$, $/N-y/$, and $/N-r/$ are the results of earlier phonological processes; forms in which nasals are deleted must therefore be more modern. In addition, we would not expect that the nasal deletion rule applied when the historical stops $*p$ and $*t$ followed nasal prefixes. Rather, nasal deletion would apply only after the stops had changed into the continuant elements $h$ and $r$.

5. At this point it might be best to summarize what we have discovered so far. We have been able to establish the following historical rule interactions and relative chronology:

(a) nasal deletion followed the spirantization of the stops which created $\_f, \_s, \_sh,$ and $x$;

(b) the spirantization of $*p$ to $h$ and $*t$ to $r$ followed the nasal voicing rule (which created $mb$ and $nd$ sequences) and followed the spirantization process discussed in (a);

(c) the rules producing $nz/\_n$ from $/N-\ast_y/$ must have preceded the rule of $\ast_y$-loss and the nasal deletion rule as it applies when $y$ follows nasals;

(d) the application of nasal deletion when $y-, h-$, and $r$-initial roots follow nasal prefixes is a more recent development than any of the above.

6. There is an interesting parallel development concerning $y$ and $r$-initial roots and nasal deletion. This is an unexpected restriction of the rule in a certain morphological category. In section 4.3., examples were given in which
the rule of nasal deletion applied when y- and r-initial roots followed nasal prefixes. The alert reader may have noticed that no nouns are included in those examples. It so happens that noun roots beginning with y or r fail to condition nasal deletion, whereas verbal and adjectival roots do condition the rule. Consider the following nominal forms:

(a) y-initial:

\[
\begin{align*}
/\text{iN-yoxa/} & \rightarrow \text{inzoxa, *iyoxa} & \text{'snake'} \\
/\text{tsiN-yofu/} & \rightarrow \text{tsiinzofu, *tsiiyofu} & \text{'elephants'} \\
/\text{iN-yani/} & \rightarrow \text{iñani, *iyani} & \text{'baboon'} \\
/\text{tsiN-yuundo/--} & \text{tsiiñuundo, *tsiiyuundo} & \text{'hammers'}
\end{align*}
\]

(b) r-initial:

\[
\begin{align*}
/\text{iN-raBu/} & \rightarrow \text{indaBu, *iraBu} & \text{'pot'} \\
/\text{tsiN-rutsu/}\rightarrow & \text{tsiindutsu, *tsiirutsu} & \text{'eagles'}
\end{align*}
\]

Notice that a purely phonological distinction cannot be maintained here, because adjectival y- and r-initial roots, which are preceded by the same prefixes /iN/ and /tsiN/ as nominal y- and r-initial roots, do optionally condition nasal deletion, while nouns do not. Thus, the distinction must be stated morphologically, stipulating that nasal deletion may optionally apply when y- and r-initial verbal and adjectival roots follow nasals, but not when nominal roots do so.

The fact that nasal deletion is limited in exactly the same way with respect both to the y-initial roots and to the r-initial roots is quite striking. Instead of merely stating the facts, by claiming that there are morphological restrictions on the rule of nasal deletion, I would like to attempt to formulate an explanation based on general principles, to account for this phenomenon. The arguments and evidence leading to the explanation are somewhat involved, and I request the reader's indulgence in dealing with them.

6.1. The first thing we should do is examine more closely the morphological categories involved. It so happens that the nominal y- and r-initial roots which block the application of nasal deletion all surface as nouns of the 9/10 class with singular and plural prefixes /iN/ and /tsiN/, respectively. Now, the nasal interaction rules of OluTsootso often effectively neutralize the underlying root-initial distinctions. This is illustrated below:
### Surface Nasal (Cluster) | Underlying Source | Examples
--- | --- | ---
nz | /N-ts/ | inzala (</iN-tsala/)
 | /N-y/ | inzofu (</iN-yofu/)
\( \bar{n} \) | /N-\( \bar{n} \)/ | in\( \bar{n} \)ama (</iN-\( \bar{n} \)ama/)
 | /N-y/ | in\( \bar{n} \)ani (</iN-yani/)
nd | /N-l/ | inda\( \bar{B} \)ushi (</iN-la\( \bar{B} \)ushi/)
 | /N-t/ | inda (</iN-ta/)
 | /N-r/ | indutsu (</iN-rutsu/)

Since surface \( \bar{n} \) and \( \bar{d} \) occur only after nasals, we would not want to analyze nz or nd forms as underlying /N-\( \bar{n} \)/ or /N-\( \bar{d} \)/. In that case, however, it is impossible to unambiguously determine the underlying root-initial segments on the basis of the evidence of the surface forms nz, \( \bar{n} \) and nd which appear in the normal singular and plural class 9/10 forms. In order to determine the underlying root-initial segment of these forms, recourse must rather be made to the diminutive or augmentative forms, because the prefixes of these classes are non-nasal. Thus, the diminutive singular forms (cl.12) of the 9/10 class nouns cited above are as follows:

inzala | 'hunger' | axa-tsala | 'small hunger'
inzofu | 'elephant' | axa-yofu | 'small elephant'
in\( \bar{n} \)ama | 'meat' | axa-\( \bar{n} \)ama | 'small meat'
in\( \bar{n} \)ani | 'baboon' | axa-yani | 'small baboon'
inda\( \bar{B} \)ushi | 'stick' | axa-la\( \bar{B} \)ushi | 'small stick'
nda | 'stomach' | axa-ta | 'tummy'
indutsu | 'eagle' | axa-rutsu | 'small eagle'

Thus, the diminutive forms allow the underlying root-initial segments to surface without being neutralized by the various nasal interactions.

### 6.2

We shall next take note of certain markedness considerations pertaining
to the nouns we are discussing. Observe that the diminutive and augmentative forms are semantically marked categories, whereas the class 9/10 singular and plural forms represent the unmarked, "nomal" forms. This means that the semantically unmarked forms surface with \( nz, n, \) and \( nd \), that is, forms in which underlying distinctions have been neutralized by morphophonemic rule interactions (involving nasals).

Now it has been proposed that there is a tendency for speakers to analyze the semantically unmarked forms as morphophonemic base forms (Vennemann 1972). If there is such a tendency, then speakers of OluTsootso should attempt to analyze the class 9/10 forms (the semantically unmarked forms) as the base forms for morphophonemic processes. But we have just seen that the class 9/10 forms are actually derived morphophonemically, and are not in fact "base" forms. Thus, the tendency to analyze semantically unmarked forms as the base forms for morphophonemic processes conflicts with the evidence of the actual morphophonemic analysis in these cases.

6.3. What I would like to propose is that it is this conflict which is responsible for the failure of nasal deletion to apply when these 9/10 class nominal forms are constructed. Since the semantically unmarked forms surface with \( nz, n, \) or \( nd \) in the 9/10 class, speakers might be tempted to analyze these as (1) morphophonemic base forms (because they are semantically unmarked) and (2) as, perhaps, \( z, n, \) or \( d \)-initial roots; that is, as if they were from \( /N-z/, /N-n/, \) and \( /N-d/ \).

If speakers do attempt such an analysis, it is easy to see why nasal deletion would not apply. The speaker's attempted analysis of the \( z, n, \) and \( d \)-initial forms as being "basic" for morphophonemic processes contradicts the phonological analysis, and in a sense obscures the fact that the roots involved are actually \( y \) and \( r \)-initial. So, if an analysis of these roots as \( y \)- or \( r \)-initial is inhibited by these facts, then of course it becomes more difficult to identify the conditioning factors (\( y \) and \( r \)) for the nasal deletion process. And if the conditioning factors cannot be identified, then the rule would not be expected to apply.

It should be pointed out that, contrary to fact, there is actually good reason to expect that nasal deletion should apply when these \( y \) and \( r \)-initial roots are preceded by nasals. This is because the application of the rule would actually serve to disambiguate between the various possible underlying sources
for surface nz/ᵣ and nd. That is, if nasal deletion were to apply to forms like /IN-yofu/, /IN-yani/, and /IN-rutsu/, surface nz/ᵣ would not result from underlying /N-y/ and /N-r/. Thus, some potential ambiguity would be eliminated in the surface forms of 9/10 class nouns, and there would be no need to obtain diminutive or augmentative forms to determine underlying root-initial segments.13

But as we have seen, nasal deletion does not apply when these y and r-initial nominal roots are preceded by nasals, despite the fact that its application would be motivated in order to avoid ambiguity. This seems to be further evidence then that speakers are avoiding an analysis of these roots as y and r-initial, because they would have excellent reason to apply nasal deletion if the roots did contain the conditioning elements y and r. 6.4. Notice then that these forms present a rather interesting problem. Current phonological theory would require us to analyze these forms as y or r-initial roots, because of the alternation evidence from the diminutive and augmentative forms, and because of the limited distribution of z and d. Yet we have seen that there is evidence suggesting that speakers are not analyzing these roots as y or r-initial, at least with respect to nasal deletion. Although it is easy enough to claim that nominal y and r-initial roots exceptionally do not condition nasal deletion, this is a non-explanatory and unsatisfying "solution." A more satisfactory explanation would be to claim that forms which are in conflict with the tendency to analyze semantically unmarked forms as morphophonemic base forms are derived by means of rather different processes than the conventional methods involving unambiguous underlying forms. To what degree this can be postulated as a universal tendency is a question which cannot be answered here; neither can the actual nature of the processes deriving these forms be adduced from this one example. 6.5. Turning now to verbal and adjectival forms, we find that there the situation with respect to markedness is completely different. y or r-initial roots would be neutralized by nasals only when the first person singular subject or object prefix precedes verbal roots. Since semantic markedness for verbs usually involves tense/aspectual distinctions, no subject or object prefix is significantly more marked than another. So, unmarked semantic forms are the non-neutralized base forms for morphophonemic processes, and no conflict
of the sort mentioned above for class 9/10 nouns exists.

Similar results obtain for adjectival roots. Since adjectival roots can be preceded by all (semantically plausible) noun class prefixes, it is again fairly easy to determine the underlying root-initial segment of a particular adjective. And the root-initial segment can be determined without recourse to the semantically marked categories such as the diminutive or augmentative. Instead, an adjectival root can occur with any of the unmarked, normal singular and plural prefixes of nouns of almost any class.

So, for verbs and adjectives, morphophonemic neutralization occurs relatively infrequently, but more importantly, the morphophonemic neutralization that does occur does not involve significant interference with the determination of base forms, and so no conflict with the markedness tendency described above can occur.

Now, as we have seen in the case of verbal and adjectival formations, nasal deletion can apply when y and r-initial roots are preceded by a nasal. It does not seem to be a coincidence that the forms which present no difficulties with respect to the markedness tendency are also those forms which do not pose a problem with respect to nasal deletion. Conversely, those nominal forms which do represent a conflict with respect to markedness are the very forms which present a problem pertaining to the application of nasal deletion.

6.6. To summarize, the fact that nasal deletion is conditioned by y- and r-initial verbal and adjectival roots, but not by class 9/10 nominal roots, can be explained by considering the tendency to postulate semantically unmarked forms as morphophonemic base forms. A conflict arises for y- and r-initial nominal roots of the 9/10 class, because the semantically unmarked forms are not in fact the morphophonemic base forms. This conflict interferes with the determination of the root-initial segment as /y/ or /r/. And this interference prevents the rule of nasal deletion from applying. For verbal and adjectival roots, no such markedness conflicts occur, and nasal deletion applies freely.

6.7. This discussion additionally provides further evidence that nasal deletion has only recently begun to apply before y and r-initial roots. If this rule had appeared earlier than the rules producing nz/ñ and nd, we might have expected it to affect nasals preceding nominal roots as easily as
verbal and adjectival roots. Instead, the nasal deletion rule has appeared relatively late, and cannot affect the "entrenched" 9/10 class y and r-initial roots, which have been subject to other nasal interaction rules.

7. The rule of nasal deletion has apparently recently begun to affect the nasal of the first person singular subject prefix /eN/ when the prefix is followed by object prefixes. This occurs even though the initial consonant of the object prefix may not normally condition nasal deletion.

7.1. Consider the following examples in which nasal deletion must apply regularly:

/eN-shi-kul-ng-a/ --> eshikulaanga 'I buy it (cl.7)'
/eN-xa-kul-ng-a/ --> exakulaanga 'I buy it (cl.12)'
/eN-xu-yaanz-ng-a/ --> exuyaanzaanga 'I like you'

7.2. In the following examples, nasal deletion may optionally apply, although the segments B, ch, l, ts and k which follow the nasal do not normally condition nasal deletion:

/eN-Ba-xup-ng-a/ --> eBaxupaanga/embaxupaanga 'I beat them'
/eN-chixup-ng-a/ --> echixupaanga/enjixupaanga 'I beat them (cl.4)'
/eN-li-xup-ng-a/ --> elixupaanga/endixupaanga 'I beat it (cl.5)'
/eN-ksi-xup-ng-a/ --> elxupaanga/enzixupaanga 'I beat them (cl.10)'
/eN-ka-xup-ng-a/ --> ekaxupaanga/engaxupaanga 'I beat them (cl.6)'

It appears then that nasal deletion may optionally apply before all obstruents when the first person singular subject prefix precedes object prefixes.

7.3. Another point of interest is that the nasal deletion rule may not apply when the l-initial tense/aspect prefixes directly follow /eN/:

/eN-li-xup-ng-a/ --> endixupaanga/*elixupaanga 'I will be beating'
/eN-la-xup-ng-a/ --> endaxupaanga/*elaxupaanga 'I am (now) beating'

Note that /li/ the distant future marker does not condition nasal deletion, whereas /li/ the class 5 object marker (cf.7.2 above) does optionally condition the rule. Thus, the nasal deletion rule must specify that only object prefixes may condition the rule, and not tense infixes, even though both prefixes may be phonologically identical. Thus, a high degree of morphologization has crept into the specification of the nasal deletion rule.

8. There is an interesting development concerning loan words and nasal deletion that merits some discussion. Nouns which are borrowed from Suahili into the 9/10 class in OluTsootso show evidence of a process of nasal deletion
which is far more general than the process we have been discussing, and which presents certain problems regarding rule ordering.

8.1. The following loan words from Swahili can be shown to be members of the 9/10 class in OluTsootso by virtue of the fact that these nouns require class 9/10 concordial agreement markers in all relevant morphological categories. It would therefore be pointless to consider these nouns as comprising a separate noun class. Notice now, that, however, the nasals of the class 9/10 prefixes have obviously been deleted in these loan words, although the initial consonants of some of the roots should not normally condition nasal deletion:

<table>
<thead>
<tr>
<th>Swahili source</th>
<th>OluTsootso sg. and pl.</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>barafu</td>
<td>ibarafu</td>
<td>ice</td>
</tr>
<tr>
<td>chai</td>
<td>ichai/tsichai</td>
<td>tea/-s</td>
</tr>
<tr>
<td>chela</td>
<td>ichela/tsichela</td>
<td>jail/-s</td>
</tr>
<tr>
<td>kalamu</td>
<td>ikalaamu/tsikalaamu</td>
<td>pen/-s</td>
</tr>
<tr>
<td>mesa</td>
<td>imesa/tsimesa</td>
<td>table/-s</td>
</tr>
<tr>
<td>bendera</td>
<td>ipeendera/tsipeendera</td>
<td>flag/-s</td>
</tr>
<tr>
<td>simu</td>
<td>isiimu/tsisiimu</td>
<td>telegram/-s</td>
</tr>
<tr>
<td>taa</td>
<td>itaha/tsitaha</td>
<td>lamp/-s</td>
</tr>
</tbody>
</table>

Notice that in these examples, consonants like b, p, ch, k and t are conditioning nasal deletion, whereas elsewhere in the language, this would never occur before roots (nasal voicing would apply instead). Apparently, loan words must be marked lexically as conditioning nasal deletion, no matter what the root-initial consonant is.

Of further interest is the length of the vowel of the class 10 prefix /tsiN/ in these examples. As the examples of native words in preceding sections show, the surface vowel of this prefix is typically long. Thus, /tsiN-siche/ → tsiisiche, 'locusts'. This can be shown to be the result of the rule of pre-nasal cluster lengthening (PNCL), which is ordered prior to nasal deletion (cf. footnote 2). Thus, /tsiN-siche/ becomes intermediate /tsiN-siche/ by PNCL, and then surfaces as tsiisiche after nasal deletion applies. But as the above examples show, in loan words the vowel of /tsiN/ is not lengthened: /tsiN-kalaamu/ → tsikalaamu, *tsiikalaamu, 'pens'. Compare also /tsiN-siimu/ → tsiisimu, *tsiisimu, 'telegrams'. This suggests that the nasal deletion process for loan words must be kept distinct from the nasal deletion process for native words 15.
8.2. A sociolinguistic motivation for the appearance of nasal deletion in these loan words suggests itself. When speakers overgeneralize the nasal deletion rule, and bypass the effects of PNCL, the effect is to (a) more closely approximate the pronunciation of the source language Swahili, because the source items are therefore not affected by the (neutralizing) native rule of nasal voicing; (b) mark these forms as "unusual", since they do not conform to the regular rules or rule orderings of OluTsootso. Furthermore, it seems reasonable to believe that the ability to recognize and produce distinctions between native and borrowed words would enhance the status of the speaker.

8.3. For our purposes, it is enough to note that the nasal deletion process for loan words represents a further extension of the regular rule, which would not normally apply to nasals when stop or affricate-initial roots follow. Since loan words from Swahili and English are probably fairly recent acquisitions, it is reasonable to conclude that this extension of the nasal deletion process is also relatively recent.

9. The evidence and discussion from the preceding sections, based largely on internal reconstruction, leads to the following historical scenario of the development of the nasal deletion rule, and the relative chronology of certain other sound changes:

Stage I: 17
(a) /CVC/ roots in the majority of forms
(b) nasal voicing and related rules account for /N-p/-\rightarrow ml,
/N-t/-\rightarrow nd; /N-y/-\rightarrow nz/ ̃.
(c) voiceless fricatives not yet created; nasal deletion probably does not exist.

Stage II:
(a) Nasal deletion begins to apply as the voiceless fricatives l, s, sh and x are formed via spirantization (cf. footnote 5)

Stage III:
(a) */y/-loss rule enters the language, creating phonemically distinct y-initial and vowel-initial roots, while nz/ ̃ alternations continue
(b) */p> h and */t> r, while mb and nd (respectively) remain.

Stage IV:
(a) Nasal deletion optionally begins to affect nasals prefixed to newly created h and r-initial roots; eventually it spreads to y-initial roots
(b) nasal deletion does not affect the nasals preceding the
Stage V: Increased generalization of the nasal deletion rule results in:
(a) the nasal of the first person singular subject prefix is deleted optionally before affricate-, liquid-, and stop-initial object prefixes, but not before tense/aspeotial prefixes
(b) loan words from Swahili in the 9/10 class condition a special, highly generalized version of the nasal deletion process, which may also account for the failure of PNCL to affect the vowel of the class 10 prefix /tsiȕ/.  

Footnotes

1 The research leading to this discussion was made possible by an NDEFL Title VI Fellowship, which also provided funds for my informant, Mr. O. Tsuna, a native speaker of OluTsootso. Thanks to the efforts of Dr. Victor Uchendu, Director of the African Studies Program, this research began in the summer of 1974. OluTsootso is part of the Luhya "cluster", and is spoken in Guthrie's Zone E.32 b, north and west of Lake Victoria.

2 The vowel of the prefix /tsiȕ/ is lengthened by a rule of prenasal-cluster lengthening (PNCL) which applies prior to the nasal deletion rule. As the examples ifula (< /iN-fula/) and eseenaanga (< /eM-seen-ng-a/) show, PNCL does not affect vowels in word-initial position. A discussion of this problem, and of general vocalic constraints, is found in Dalgish 1975 b.

3 A vowel copy process copies the vowel following /ng/ to the left. The vowel is then lengthened by PNCL.

4 Bantu languages are characterized by an elaborate system of concordial agreement. The system involves a number of noun classes which govern agreement processes on adjectives, subject and object prefixes, and in other categories. These classes have been assigned class numbers in various Bantu languages, and may often be used in pairs to indicate the singular and plural forms. In a later discussion, I shall refer to "nouns of the 9/10 class", which actually means "the singular and plural forms of nouns which have the prefixes and concordial agreement associated with the classes numbered 9 and 10". The abbreviated forms referring to these nouns and noun classes should present no difficulties.

5 An archaic form for xaaxano (< /N-xa-a-xa-no/) 'It (cl.12) is it' is ngaaxano. The initial ng sequence is evidence that x is from *k, because /N-k/ does yield ng by a nasal voicing and assimilation process.

These fricatives are limited distributionally in the following ways: there are very few s-final verb roots, and no sh- and f-final verb roots; in an isolated example, % appears from % in the causative: /tiM-i/ --> tifii/tiifii, 'cause to lose', while other B-final forms do not show a B/f alternation.
Guthrie postulates *p or *b as the source of f when the ‘super-high vowels’ *i and *u follow. Similarly, *s is derived from *t or *d when *i follows. *k is the source of x and sh; the latter appears before front vowels. There are of course some additional complexities in the historical development which do not however affect the points discussed above.

6 Guthrie’s *p does correspond to OluTsotso h in a large number of examples.

7 When nasals are prefixed to b or p-initial roots, mb surfaces. The h→b/N rule is blocked when the h-initial root is minimally distinct from a P-initial root:
   /N-kaamb-á/   ‘Catch me’   /N-Baamb-á/   ‘Sacrifice me’
   --> haambá, *mbaambá --> mbaambá
   /N-heelel-á/   ‘Breathe on me’   /N-Beel-el-á/   ‘Have pity on me’
   --> heelelá,*mbeelela --> mbeelelá
There are further complications which do not affect the points discussed. For further discussion, cf. Dalgish (under preparation).

8 There is no evidence in OluTsotso to suggest that nasals are deleted before voiceless stops (of roots), but at least two Eastern languages, Swahili and Chi-Mwini, do show evidence of such a rule.


10 Nasal deletion must apply when r-initial verbal roots are preceded by a nasal if nasal hardening would produce an homophonous nasal form nd from /N-l/: /N-rek-á/ ‘Trap me’ /N-lek-á/ ‘Despise me’
   --> reká, *ndeká --> ndeká
Nasal deletion does not apply before certain y-initial roots which surface with mb when a nasal precedes: /olu-yia/-oluya, ‘people’; /tsiN-yia/- tsiimbia ‘peoples, army’. This is discussed in Dalgish (under preparation). Other restrictions on nasal deletion applying when y- and r-initial roots follow nasals are discussed later in this paper.

11 It seems that *y was lost in root-initial position when short vowels followed, and either retained or re-inserted when long vowels followed. For further discussion, cf. Dalgish 1974, and Dalgish (under preparation).

12 Still another possibility is that speakers might attempt to analyze these roots as nz-, n-, or nd-initial. However, nasal cluster-initial roots do not usually occur in the language, and are never found in verbal roots, or in the 9/10 class nominal forms where a nasal would precede. (The only two examples of nasal-cluster-initial roots are /ndu/, ‘person’, and /nji/, ‘many’, neither of which can be directly preceded by a nasal prefix). A problem for
this analysis would still remain because of the alternation evidence provided
by the diminutive and augmentative forms, which do not surface with a nasal-
cluster in root-initial position. Thus, these nz/n and nd forms are probably
not analyzed as nasal-cluster-initial roots.

The ambiguity would still remain with respect to nd forms, which would
then have only two possible sources: /N-t/ and /N-r/. At least this would be
an improvement if a third source, /N-r/, were to be eliminated.

The first example is probably ultimately from English 'jail'; the
second is from Portuguese bandeira, 'flag'. These words were probably borrowed
into Swahili, and then into OluTsootso.

One way to accomplish this would be to order the special rule of nasal
deletion for loan words prior to PNGL.

The fact that these loan words have resisted assimilation into the
regular rules and rule orderings of OluTsootso seems to indicate that they
have arrived relatively recently in the language. If they had been borrowed
much earlier, we might have expected them to conform gradually to the
phonological processes of the language more completely.

Comparative evidence would show that this stage is Proto-Bantu.

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