ANOTHER LOOK AT META-RULES AND "FAMILY UNIVERSALS"*

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This paper addresses the general question of language-specific meta-rules within the setting of a reconsideration of recent proposals by Katamba [1977] concerning the articulatory mode of Luganda. In particular, it examines Katamba's claim that language-specific considerations can override universal marking values in phonology, producing segments which are counterpredicted by markedness theory. Developments such as the creation of geminate consonants lead Katamba to accept Lass' [1972] proposal that the universal basis of markedness theory be rejected and replaced by "family universals". This paper provides a reanalysis of certain data cited by Katamba in support of his analysis and also raises some general theoretical questions concerning the notion of phonological meta-rule. In Sections 4 and 5, Lass' proposal is examined in detail via the example of click sounds in Southern Bantu languages. It is demonstrated that, contrary to Lass' assertion that clicks are neither marked nor unmarked in click languages, the evidence of diachronic and synchronic language behavior clearly supports their marked status.

1. Introduction

In a recent article appearing in this journal, Katamba [1977] argues

that the operation of synchronic and diachronic phonological processes

in certain languages may be governed by *meta-rules,* i.e. general principles

which determine the "phonetic mode" of the language. Katamba considers

in detail some data from Luganda, a Bantu language of Eastern Africa,

which he claims point to the fact that Luganda phonology is governed

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by two general tendencies: Vowel Lowering and Consonant Strengthening.
In certain instances, e.g. the creation of geminate consonants under
certain well-defined conditions, segments which are counter-predicted by
markedness theory are created. Such developments are cited in support
of Lass' [1972] claim that markedness theory as outlined by Chomsky and
Halle [1968] is largely devoid of content as a theory of universal
predictions. In place of universal marking values, Lass argues in
favor of so-called "family universals", i.e. language- or family-specific
proposals for marked and unmarked values in phonology. In this paper,
Lass' proposal as well as Katamba's more specific analysis of Luganda
are considered in detail. It will be argued that Lass' fundamental
objections to the theory of universal phonetics are not well-founded and
that the notion of meta-rule, at least insofar as it effects the
"phonetic mode" of Luganda, is without content.

2. Vowel Lowering

The first of the general principles governing Luganda phonology
proposed by Katamba is Vowel Lowering. This meta-rule is demonstrated in
two examples, one synchronic and one diachronic. The synchronic alter-
nations involve the vowel of the preprefix of noun class markers. A
partial list of the noun class prefixes and their respective preprefixes
follows:

(1) 1. o-mu   2. a-ba
     3. o-mu   4. e-mi
     5. e-C   6. a-ma
     7. e-ki   8. e-bi
     9. e-N   10. e-N
    11. o-lu
    12. a-ka   13. o-tu

The occurrence of the preprefix in a particular environment is determined
by the syntax and does not concern the present argument. Historically,
the preprefix was a copy of the pronoun or demonstrative of the class;
this pattern still occurs in some closely related languages.[1] Synchronically,

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[1]For example, Lumasaaba has the following set of prefixes and preprefixes:

however, the form of the initial vowel is most easily described in terms
of a rule such as:

(2)

$$\emptyset \;\rightarrow\; \begin{bmatrix} V \\ -high \\ \alpha low \\ \alpha back \end{bmatrix} \;/\; \#\underline{\quad} \;+\; C \begin{bmatrix} V \\ \alpha low \\ \alpha back \end{bmatrix} \;+$$

i.e. the initial vowel agrees with the prefix vowel in backness and
lowness, but it will be [-high] if the prefix vowel is [+high].[2] The
important generalization is that only three vowels function as prefix
vowels, /i u a/, and three vowels are preprefixal vowels, /e o a/.
Thus, all of the five synchronic vowels of Luganda are represented as
initial or prefixal elements.

Katamba points out that the neutralization of non-low vowels in
initial position in favor of /e o/ is counterpredicted by the principle
of maximum differentiation. That is, if the five-way opposition
/i e u o a/ is to be neutralized in favor of a three-member set, we
expect the maximally distinct /i u a/, which occur in the prefixal set.
However, since the rule of Vowel Lowering affects only noun class
preprefixes so that initial i and u will always be followed by i
and u respectively, this could be regarded as a dissimilation, for
example, if a functional explanation is desired. It is important to
maintain the distinction between state and process in explanation, a
distinction which is obscured in much of Katamba's analysis. This
distinction is discussed further in Section 3.

1.	u-mu	2.	βa-βa
3.	gu-mu	4.	gi-mi
5.	li-si	6.	ga-ma
7.	ki-ki	8.	βi-βi
9.	i-N	10.	zi-N

In all classes, except Class 1, the preprefix is identical to the pronoun
preceding the verb [Brown 1972:15-16]. Brown notes that this is consistent
with Sir Harry Johnston's hypothesis that the Bantu prefix was primarily a
classifier and the preprefix an abbreviated pronoun and demonstrative in
the proto-language.

[2]The generality of such a rule could be used in an abstract analysis to
argue for a synchronic prefix final /i-/ for Class 5 and 9/10 prefixes.
Historically, the Class 5 prefix is *li- and Class 9/10 *ni-/li-ni. Cf.
footnote 9.

Katamba argues that rule (2) above points to the non-high vowel articulatory mode of Luganda. This explains why no words in Luganda may begin with high vowels although individual morphemes may, e.g. -iso 'eye' and -ungu 'vegetable marrow'. The question to be raised at this point is not whether the gap of word-initial high vowels represents a valid generalization, but rather what the explanation for that generalization may be. It does not seem that the postulation of a meta-rule constitutes an explanation in any real sense of the term. On the one hand, a meta-rule whose existence is demonstrated by only one process in the synchronic grammar of a native speaker is a rather suspect candidate for the category of "meta-rule". There is no other process involving Vowel Lowering at work in the synchronic grammar of Luganda.

It is possible, on the other hand, to argue that Initial Vowel Lowering is not a synchronic process, especially since there is no evidence to suggest that preprefixal [e o] are underlyingly /i u/ in the synchronic grammar. Apart from the nominal forms in which the initial consonant of the preprefix has been lost, there are few words which begin with vowels in Luganda. The only other examples would be second and third person verbal forms, e.g. ogula 'you buy', agula 'he buys'. Comparative evidence demonstrates that the o- prefix represents a lowering from an original *u- . There are, as was mentioned above, a fair number of individual morphemes with initial high vowels, but these typically derive from *į and *ɥ . Many of the morphemes with initial mid vowels in Luganda have cognates in other languages with high vowels, and the reconstructed forms for these again indicate lowerings. Finally, it should be mentioned that final high vowels are also rare; the only notable exceptions to this generalization are the agentive suffix -i and the adjective suffix -u , both of which derive from superclose vowels. Thus, there is good evidence to suggest that Vowel Lowering can be invoked as a historical force in the shaping of Modern Luganda. However, the evidence for a synchronic meta-rule of Vowel Lowering is not strong, being confined to a single example, which can as appropriately be viewed as diachronic. In fact, a consideration of "secondary evidence" (cf. Dressler [1977]) also argues against

assigning synchronic status to Initial Vowel Lowering. For example, Baganda exhibit no tendency to lower initial high vowels in second language learning. This kind of transfer would be expected if Vowel Lowering were a fact of Luganda phonology. The non-transfer of this pattern suggests that the absence of initial high vowels in the Modern Luganda lexicon may be viewed from the synchronic perspective as an accidental gap.[3]

The other example of Vowel Lowering cited by Katamba is a clearly historical process, not operative in the synchronic phonology. It concerns the merger of the original Bantu seven vowel system into the five vowel system of Luganda. Proto-Bantu had the seven vowels /ɪ i e ʮ u o a /, which became Luganda /i e u o a/ by the following mergers:[4]

(3)
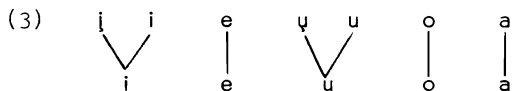
Thus, the so-called "superclose" vowels merge with the corresponding non-superclose vowels. Several points need to be noted here. First, merger in favor of any five vowel system other than that represented above would be extremely surprising, e.g. /ɪ i ʮ u a/, /ɪ e ʮ o a/. Second, while the above reconstruction of seven vowels is solid, it has been proposed, at least informally, that this phonemic system may have had phonetic correlates such as [i ɪ e u ʊ o a] or [i e ɛ u o ɔ a]. A reduction of the latter system to five surface qualities would involve a merger of the non-low vowels and subsequent raising of the low vowels [Herbert 1976:115]. If this were the case, then the reduction is an instance of Vowel Raising, not Lowering. However, the issue of the phonetic values of the Proto-Bantu vowels is far from settled.

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[3]The operation of word games, another frequently cited type of "secondary evidence", provides no information in this case since all medial syllables are CV(V) in the surface phonology, e.g. kijiiko is syllabified ki.jii.ko . Thus, a reordering of syllables will never produce initial vowels. Only idential sequences of vowels are permitted.

[4]The collapse of seven vowels into five is not confined to Luganda, but occurs in nearly all the Interlacustrine languages.

By way of summary to the present section, it has been demonstrated that the existence of a meta-rule governing the mode of "non-high vowel articulation" in Luganda is rather suspect. The only possible synchronic example of such a rule is Initial Vowel Lowering of the preprefix, and it is far from clear what the content of the term *meta-rule* might be in such a case. The evidence in support of viewing the articulatory mode as a diachronic phenomenon is certainly stronger. It needs to be remembered, however, that we are dealing in these cases with the phonetics of prehistory, and certain of the data cited in support of Vowel Lowering allow for alternate interpretation.

3. Consonant Strengthening

The second general principle which is said to govern the phonology of Luganda is Consonant Strengthening. There are three general processes, all active in the synchronic phonology, which are cited in support of such a meta-rule. These include: (1) the post-nasal hardening of /β l y/, (2) the output of Meinhof's Rule as a long nasal, and (3) the creation of geminate consonants in certain contexts. Each of these processes will be considered independently in the following sections.

3.1. Post-Nasal Hardening. Like all Bantu languages the nasal noun class prefix /N-/ of Class 9-10 assimilates in position to the following oral consonant,[5] e.g.

(4)	Singular (Cl. 11)	Plural (Cl. 10)	
a.	luku	ŋku	'(piece of) firewood'
	lugalo	ŋgalo	'finger(s)'
	lusozi	nsozi	'hill(s)'
	lutindo	ntindo	'stair(s)'
	luviiri	ɱviiri	'(a) hair'
	lufumo	ɱfumo	'legend(s)'

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[5]This statement is not quite accurate since some languages no longer have a nasal in the Class 9/10 prefix. However, all languages with a nasal prefix exhibit assimilation of the nasal to the following consonant. The loss of the prefix-final /i-/ is very old, going back to Proto-Bantu.

(4) cont.

b. luyola   ñjola   'groove(s) in carving'

    lulagala   ndagala   'plantain leaf/leaves'

    luβili   mbili   'palace(s)'

In addition to position assimilation of the nasal prefix, the forms in
(4b) also exhibit post-nasal hardening of the oral consonant. This
hardening, Katamba claims, is part of the larger phenomenon of
Consonant Strengthening. The same process occurs after the first per-
son singular subject marker /N-/, e.g. /N+laba/ ndaba 'I see',
/N+yitaba/ ñjitaba 'I respond'. This process is well-established, and
for /l y/, it is not possible to argue that [l y] are simply the products
of weakening since [d j] also occur in this position: ludikya 'child's
word game', lujegere 'chain', ndaliza 'I embroider' (cf. kudaliza 'to
embroider'). However, whether the process also produces [b] of [mb]
is open to question since the traditional analysis of the consonant
system posits /b/. In fact, [b] and [β] are in free variation everywhere
except postnasally where only the former may occur. This alternation
has been treated in terms of a variable rule elsewhere [Herbert 1974]
where the likelihood of [β] is increased in less formal speech. The
consultants upon whose speech the present researches are based had [b]
as often as [β].[6] This existence of /β/ would be somewhat surprising in
Luganda since the velar member of the voiced series is clearly /g/.[7]
This counters the general expectation that the velar position is a "weaker"
articulation, i.e. we would expect /β/ only in the presence of /ɣ/ in
Luganda. There is no phonetic justification for /ɣ/, however. In any
event, postnasal hardening is clearly part of the grammar of Luganda,
affecting at least /l y/.

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[6]My two major consultants are both natives of Kampala. It is
possible to arrange the probability of [β] in a hierarchy or scale of
increasing likelihood [Herbert 1974:31]:

$$/b/ \rightarrow [\beta] / \#\_\_\_G \rightarrow V\_\_\_G \rightarrow \#\_\_\_V \rightarrow V\_\_\_V$$

There is no parallel hierarchy for /l y/, e.g. /l/ is [d] only post-
nasally and when geminated.

[7]For the speech of my consultants, /g/ exhibits no tendency toward
spirantization although Katamba [1974] mentions such a tendency for his
own speech.

The question then is whether the post-nasal hardening of /l y/ can
be invoked as evidence for a language-specific phonetic mode
favoring strong consonants. Several points bear on such a determination.
First, the hardening of post-nasal /l y/ is very nearly universal when
the nasal-oral sequence is to be realized as a prenasalized consonant,
i.e. a unit articulation exhibiting the surface duration of a single con-
sonant.   In a survey of hundreds of grammars, no convincing cases of
unit nl   or   ny , where the y is not simply a secondary articulation,
were found.   Cases of unit [mβ] are extremely rare as are many other
nasal-continuant sequences. One of the very few examples of [nθ] is
that of Sherbro, cited by Ladefoged [1968:47]. The existence of [nθ]
is especially surprising since Sherbro also exhibits the fricatives
/f v s/, and none of these occur prenasalized. Interdental fricatives
are rather rare as a class of sounds, however. Kikuyu has /ð/, but no
[nð] since nasals are obligatorily deleted before all continuants;
Kamba exhibits surface [nð] though.

What is surprising about Luganda, if indeed it is govererned by a
meta-rule of Consonant Strengthening, is that prenasalized /ŋf ŋv ns
nz/ all exist and exhibit no tendency toward strengthening. In a few
languages, all consonants are hardened and voiced after nasal consonants
so that there is a complete neutralization of oral consonants at each
point of articulation in this environment, e.g.

(5) $\left\{ \begin{array}{l} \text{/N + b/} \\ \text{/N + p/} \\ \text{/N + v/} \\ \text{/N + β/} \\ \text{/N + f/} \\ \text{/N + w/} \end{array} \right\}$ →   [mb]

pointing to the unmarked status of nasal plus voiced stop sequences.
However, this is a relatively infrequent situation. In some languages,
the hardening is taken only as far as affrication. Thus, for example,
/N+f/ → [mpf]. The essential point of the present discussion is that
Luganda hardens only /l y/, consonants which are almost universally
hardened, but does not harden /f v s z/, which hardening would support

the notion of meta-rule if it did occur.

3.2. _Meinhof's Rule_. The second process invoked by Katamba as
evidence for the principle of Consonant Strengthening is the operation
of Meinhof's Rule, also known as the Ganda Law. This rule has been
the subject of much discussion which does not concern the present
argument. The effect of the rule is to nasalize /b l y g/ when
they occur as the oral component of a prenasalized consonant when a
nasal occurs in the next syllable:

(6) /N + bengo/   [mmeŋgo]   'grind stones (cf. lubengo 'grind stone')
     /N + limi/   [ɲnimi]   'tongues' (cf. lulimi 'tongue')
     /N + yingila/   [ɲɲiŋgila]   'I enter' (cf. kuyingila 'to enter')
     /N + gaana/   [ŋŋaana]   'I refuse' (cf. kugaana 'to refuse')

However, as Meussen [1963:25] has pointed out, the rule affects only
/b l y g/ which can be traced to Common Bantu.[8]

    As has been discussed in previous treatments of Meinhof's Rule,
Luganda is rather special in the operation of the rule in that the output
is a long, i.e. geminate, nasal of which the first member is syllabic
in initial position. Compare forms from Lamba, where the output is a
simple nasal:

(7) /i + N + βangɔ/   [imaŋgɔ]   'bonds'
     /i + N + βansa/   [imansa]   'tattoo'
     /i + N + lɛmbɔ/   [inɛmbɔ]   'courtyards'

The distinction in outputs is explained by the fact that most Bantu
languages have a general process NN → N, which Luganda does not, e.g.
Lamba /N + ŋat + e/ → [ŋatɛ] 'let me snarl', Luganda /N + ŋool + e/ →
[ŋŋoole] 'let me disapprove'. Thus, whereas other languages systematically

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[8]There are extremely few exceptions to this generalization.
Brown [1972:165-66] notes that in the Manjiya dialect of Lumasaaba,
Meinhof's Rule applies to /β l y/ as well as to voiced non-stops pro-
duced by a general weakening rule from /p t k/, e.g. /i + N + pima/
imima 'hyena', /i + N + temu/ inemu 'snake'. Manjiya is innovative
in this respect and the other Southern dialects preserve the order:
1. Meinhof's Rule, 2. Weakening. For a general discussion of the
facts of Meinhof's Rule, see Herbert [1977b].

eliminate NN sequences, such sequences are processually produced in
Luganda. Of course, this reflects the more general face that all
consonants have geminated counterparts in Luganda unlike most Bantu
languages. Thus, NN occurs within single morphemes as well, e.g.
-mma 'grudge, withhold', -ñño 'tooth', -kinnimba 'walk proudly',
-waŋŋana 'give each other'. It would therefore be surprising for
Luganda to simplify geminate nasals which appear as the output of
Meinhof's Rule. The more surprising fact, and the most convincing
evidence for a Consonant Strengthening mode, is the occurrence of
geminate consonants in Luganda, regardless of their source.

3.3. <u>Geminate consonants</u>. One of the most remarkably non-Bantu
features of Luganda phonology is the occurrence of surface geminate
consonants. Historically, most of the present-day underlying geminates
can be traced to sequences */ịC/, e.g. *-jjβ- 'steal' Luganda -bba ,
*lị+tabi 'branch' Luganda -ttabi. In fact, the synchronic realization
of the Class 5 noun prefix (< *lị) is a gemination of the initial con-
sonant:[9]

(8)   <u>Class 5 (Singular)</u>   <u>Class 6 (Plural)</u>

ggye	magye	'army/armies'
kkubo	makubo	'road(s); path(s)'
ccupa	macupa	'bottle(s)'
zzike	mazike	'chimpanzee(s)'
bbala	mabala	'spot(s)'

Long nasals also arise from the operation of Meinhof's Rule and also
by prefixation of /N-/, the Class 9-10 prefix, to a nasal-initial stem,
e.g. ṃmuli 'reeds' (cf. lumili 'reed').

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[9]The fact that the prefix vowel was originally /i/ is demonstrated
by the fact that the preprefixal vowel is /e/. Cf. Section 2. Also in
a very limited set of marked stems beginning with a prenasalized con-
sonant or a geminate consonant, the Class 5 prefix is /li-/, e.g.
liñño 'tooth', liggwa 'thorn'. Also before vowel-initial stems the
prefix is ly- , e.g. lyemvu 'ripe banana'.

Katamba notes that long segments are marked and their existence in Luganda points to the fact that a language may override the supposedly universal bases of markedness theory when it is governed by an articulatory mode counter-predicted by that theory. With regard to the geminates of Luganda, Katamba [1974:159] claims that "markedness theory would predict that they should be lost in the course of language change." However, contrary to universal predictions, the geminates of Luganda are not only stable, but are also produced by recent innovation. The innovation in question concerns another case of prefixal vowel loss, viz. the /u/ of the infinitive prefix /ku-/ so that there are the following alternations:

(9) Standard dialect   Innovating dialect

     kukola   kkola   'to work'

     kukima   kkima   'to fetch'

     kugoba   ggoba   'to drive away'

i.e. the prefix vowel is deleted and /k-/ assimilates to the following consonant, thus producing a surface geminate. In the dialect reported in Katamba [1977], this innovation occurs only before non-nasal velar-initial stems,[10] but Katamba [1974] notes that his younger brother also has forms such as ppima 'to weigh' (kupima), ttema 'to chop' (kutema), ssala 'to divide' (kusala).

A phonetic explanation for this innovation is not hard to find. It has been documented elsewhere that the prefix vowels of Luganda are "extra short" in duration [Herbert 1974]. Given the articulatory similarities of /k/ and /u/, it is not surprising that the prefix /ku-/ might be realized as a strengthening of non-nasal velars. The spread of this process to non-velar stems represents rule generalization, which may ultimately result in a morphological reanalysis of the infinitive prefix as /(o)C-/.

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[10]The restriction that the process applies only before non-nasal velars is absent if the prefix does not directly precede the verb root [Katamba 1974]:

    /ku + ba + laba/   bbalaba   'to see them'

    /ku + mu + laba/   mmulaba   'to see him'

The real issue is not, however, how these geminates arise, but the fact that they arise at all. It has already been mentioned that this leads Katamba to accept Lass' [1972] rejection of the universal bases of markedness theory in favor of language-specific markedness, i.e. geminate consonants are not marked in Luganda because Luganda phonology is dominated by a particular articulatory principle. If it were not, we should expect geminate consonants to be lost rather than increase. Lass' theory is discussed in greater detail in Section 4. It will suffice to point out here that markedness theory does not claim that geminate consonants will never develop in the course of a language's history or that they will quickly die out in the course of linguistic evolution. Rather, it claims that such sounds are "less favored". It predicts that a context-free change from geminate to simple consonant should be common whereas the reverse process:

(10) $C_i \rightarrow C_i C_i$

should be uncommon. The Luganda case does not fit the above schema; the "spread" of the geminate consonants poses no problems for markedness theory since it does not result from the spontaneous strengthening of normal consonants.

3.4. Summary. By way of provisional summary, Katamba's three examples of Consonant Strengthening have been examined in some detail. The case of post-nasal hardening was inconclusive since not all consonants are hardened in this position and the hardening of /l y/ in this environment is a near-universal process. Obviously, a process which is universal can have no value in arguing for a language-specific phonetic mode. Even if the process were merely inherited from Proto-Bantu, it can have no more value in this regard than it can in arguing for the degree of genetic relatedness of two languages.

Meinhof's Rule, the second of Katamba's examples, was shown to be an instance of geminate consonants. The existence of geminates in Luganda is an uncharacteristically Bantu trait. The question is whether the existence of such a trait is in itself evidence for a phonological meta-rule. All of the geminates of Luganda can be traced

to either a diachronic or synchronic sequence of segments. It would seem that the existence of geminate consonants does not really say anything about an articulatory mode unless we find a general preference for strong consonants, which we do not.[11] Indeed, if anything, it would seem that the opposite approach to the question of articulatory mode may be more profitable in this situation. That is, in languages which systematically eliminate surface sequences of consonants, regardless of their source and whether they carry morphological information, there may exist better evidence for a phonological principle governing the CV structure of these languages. However, there are some general conceptual problems with the notion of meta-rule as well as the notion of "family universal", some of which are reviewed below.

4. Family Universals

The theory of markedness in generative phonology is an attempt to establish a universal evaluation measure for phonology which is based on an assumption of "intrinsic content" assigned to every phonological feature. In addition to specific marked and unmarked values for features, the theory as articulated by Chomsky and Halle [1968] and Postal [1968] includes a "linking" principle which relates these feature proposals to conditions on the output of phonological rules. This theory claims that a universal phonological structure of rules converts abstract marked and unmarked values into a less abstract matrix consisting of + and - specifications. It is claimed that for every feature in every context one such feature value is "natural" and costless, the other "unnatural" and with a cost [Postal 1968:167].

The various types of considerations which are methodologically involved in the assignment of marked and unmarked values are well-known

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[11]In fact, there are several natural assimilatory processes which regularly give marked segments, e.g. vowel nasalization:

$$V \rightarrow [+nasal] \: / \: \_\_\_ \: [+nasal]$$

However, these changes always occur in a restricted environment and the increase in marked segments is therefore modest. It would not be profitable to argue that languages with such natural rules are governed by meta-rules of Vowel Nasalization.

[Greenberg 1966]; they include such data as statistical frequencies, diachronic mergers, synchronic neutralizations, etc. However, it is important to remember that the considerations as a group represent only a class of *observations*. In this sense, there is nothing "intrinsic" about the theory of markedness as a theory of content. The theory is one of observation and therefore probability:

> Accepting such a theory commits one to determining for
> each feature value in each context grounds for a non-
> arbitrary choice of M or U representation.... Such a
> theory does not claim that in *every* case the Unmarked
> phonetic element will actually appear in the position
> of neutralization. It claims only that this will be
> the case in the majority of instances since, if it is,
> no special language particular rule is required.
> [Postal 1968:168]

The critical value of such a theory is significantly weakened, not by the infrequent instances in which its predictions do not obtain, but rather by the total lack of *explanation* which is incorporated into the theory. For example, it is known that the unmarked value for non-back vowels is [-round]. This is captured in the formulation proposed by Chomsky and Halle [1968:405]:

(11)

$$[\alpha \text{ round}] \rightarrow \left\{ \begin{array}{l} [\alpha \text{ round}] / \underline{\hspace{1cm}} \\ \quad\quad [\alpha \text{ back}] \\ \quad\quad [- \text{ low }] \\ {[- \text{ round}]} / \underline{\hspace{1cm}} \\ \quad\quad [+ \text{ low }] \end{array} \right\}$$

That is, vowels which are $\begin{bmatrix} -\text{back} \\ -\text{round} \end{bmatrix}$ are in some sense less costly than those vowels which are specified as $\begin{bmatrix} -\text{back} \\ +\text{round} \end{bmatrix}$. There is no explanation for this fact within the theory. As Postal points out [1968: 170-71], we may hope that physiological and perceptual investigations will ultimately provide evidence for the assignment of M and U values. Lass [1972] has examined this particular proposal concerning the roundness of vowels in detail and attempted to show that in some language families, e.g. Germanic, marking conventions for vowel round-ness reduce to a statement of very weak probabilities. Lass claims on this basis that marking conventions have no predictive value in such cases since the "more costly" grammars of Germanic languages with front rounded vowels function as well as those of Germanic languages without such

vowels and as well as the grammars of language families in which the
convention is almost absolute, e.g. Bantu. There is no explanation for
the failure of marking conventions in Germanic. Therefore, Lass is led
to reject markedness theory in its universal form and to substitute
family-specific conventions.[12] The only alternative is to inject
content and explanation into the original theory; this does not seem
realizable at the moment.

It is clear, as Lass maintains, that markedness theory fails rather
severely as a theory of intrinsic content. However, it does represent
a successful prelude to such a theory. It has been demonstrated elsewhere
[Herbert 1977a] how content is to be injected into the foundation of
the theory in certain instances in a non-arbitrary fashion and the true
explanatory value which results therefrom.

Lass' basic objection to the current theory is that it fails to
reconcile meta-theoretical considerations of simplicity with language-
internal economy of individual phonological systems. Markedness theory
claims that front rounded vowels, clicks, geminates, etc, will be rare
among the languages of the world. How then, Lass asks, are we to recon-
cile these universal considerations with the sound systems of Swedish,
Zulu, and Luganda? According to the theory, not only should unmarked
segments be favored in synchronic neutralizations, but they should pre-
dominate in diachronic developments as well. Lass interprets this to
mean that unmarked sounds will always gain ground at the expense of the
marked sounds and that new marked sounds will not develop. Of course,
such was not the serious intent of the theory; this would be equivalent
to claiming that all phonological evolution is directed toward the
development of an optimal sound inventory consisting of a single con-
sonant and single vowel. In this case, all linguistic utterances would
have the phonetic shape [paβaβa...]. Nevertheless, Lass goes on at
great length in his discussion of front rounded vowels to demonstrate

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[12]Although the fact that there are *any* exceptions should invalidate
the family-specific generalizations proposed by Lass. For example,
Kiyanzi, a Bantu language cited by Welmers [1973:21], contrasts front
rounded and unrounded vowels /i e ü ö ʉ u o a/ .

that they do indeed persist and develop anew in Germanic. Lass' choice
of this example is less than felicitous, however. In addition to the
coloration of these vowels, other considerations such as length and
tenseness play an important role in their history. Thus, the interaction
of various features is more complex than Lass presents.

Lass' dismissal of the theory on these grounds as being devoid of any
interesting theoretical considerations seems a bit hasty. In the
following section it will be demonstrated that even for language inven-
tories which are highly marked in generative terms, the theory is not
devoid of content. The case to be considered is not that of front rounded
vowels in Germanic, but another cited by Lass several times, viz. the
click sounds of Southern Bantu.

5. Clicks in Bantu

The basic assumption of the present discussion is that the click
sounds are indeed marked segments.[13] They occur only in certain re-
stricted Southern Bantu languages and in Khoisan, from which they were
originally borrowed into Bantu. On the one hand, the fact that Zulu
and other languages should have incorporated clicks into their phono-
logical systems is a point which weighs heavily against markedness theory.
Historically, we know that Bantu had no clicks and that they were in-
troduced during a period of particularly intense sociological contact
in which Khoisan women were taken as wives by the invading Bantus.
Lanham [1964:383] describes the system of polygamy practiced by the
Bantus and notes that the father was only an "occasional visitor" to
his families. Therefore, the greater influence during the child's
early years was that of the mother, and it was only later that the
influence of the father and the extended family began to be felt. This
type of situation differs considerable from the canonical varieties of
language contact, which may explain the extraordinary linguistic results.

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[13]The unmarked airstream mechanism is the pulmonic egressive one.
That is, glottalic egressive (ejectives), glottalic ingressive
(implosives), and the velaric (clicks) are all marked mechanisms. It
is unclear what, if any, is the relative markedness of the latter three
types.

For example, fully 17 of the present 47 consonant phonemes in Zulu were introduced from Khoisan. Lanham places the original contact between the Bantu and Khoisan peoples between five and seven centuries ago. This is the point of departure for the following discussion.

Were we to assume an unmarked status for the click sounds in Nguni, for example, we would have no way of accounting for the reduction of click oppositions in many languages since other consonant oppositions make use of the same points of articulation. There are five click types in the Khoisan languages:

(12)   ⊙ bilabial click
        ʇ dental click ([/], c)
        ʄ pre-palatal click ([≠])
        ʗ palato-alveolar click ([!], q)
        ʖ lateral click ([//], x)

All the Bushman languages exhibit four types, but the labial click occurs rather infrequently [Bleek 1939]. We do not find any Bantu language which makes use of the full range of oppositions.

Zulu and Xhosa exhibit the most extensive incorporation of clicks into sound inventories. Both languages distinguish three main click types: the dental click, palato-alveolar click, and the lateral click. Lanham [1964:382] reports that fully one-seventh of Zulu words and one-sixth of Xhosa words contain clicks. These are, of course, mainly words which are borrowed from Khoisan. Bantu words which exhibit clicks come mainly from the hlonipa vocabulary. Hlonipa (also hlonipha) is a process whereby taboo words undergo various phonetic alterations. These alterations include the substitution of:

(13) a. a non-click for a non-click
     b. a click for a non-click
     c. a click for a click
     d. a non-click for a click

Faye [1923-25] provides a detailed discussion and numerous examples of the process.

Pedi [Stopa 1960:23] is reported to distinguish two clicks: the

pre-palatal and a retroflex fricative. Ziervogel [1952:8] reports a contrast between the dental and palato-alveolar types in Swazi. Thus, Zulu amaxɔlo 'bark' may be found in Swazi as ɛmacɔlɔ , ɛmaqɔlɔ , ɛmagcɔlɔ , ɛmagqɔlɔ . However, Stopa and Lanham both claim that Swazi has a single click type, which is substituted for all other varieties. Similarly, in Sutho [Tucker 1929:63] there is only one click, the palato-alveolar, and in the other Sutho-Tswana languages the clicks have disappeared entirely.

Knowing, as we do, extremely little about the routes and chronology of click incorporation into various Bantu languages, we might attempt to explain the number of types in any language as an inverse function of the directness of borrowing. That is, those languages which borrowed directly from Khoisan should exhibit the greatest number of distinctions and those which borrowed via other Bantu languages should show reduced inventories. This would constitute an argument supporting the marked status of the clicks, albeit a rather weak argument. Such an argument would, of necessity, make socio-historical claims about contact which cannot be substantiated since we are dealing with pre-history. Additionally, a much stronger argument in favor of the marked status of clicks in Bantu would be forthcoming if we suppose that languages may previously have had a wider range of clicks than they evidence at present. This would be especially powerful since we know of no cases of languages independently increasing the number of clicks in their inventories.[14] Of course, just as there is no evidence that the clicks were introduced indirectly into some languages, there is no evidence that all the Bantu click languages previously had the full series of clicks or even the number of oppositions presently displayed in Zulu. However, there is evidence that at least some languages have reduced their click inventories and that in some languages the clicks have been eliminated entirely. Stopa [1960:23] cites Elmslie's observation that among the older Ngoni

[14]A fundamental difference is assumed between languages without clicks incorporating them into their sound systems and languages with click sounds increasing their inventories.

[*sic*] people, all the clicks are attested as in Zulu. Apparently, the dental click replaced the other types in normal speech and a "new dialect" appeared which had various combinations of consonants as substitutes for clicks. In Northern Transvaal Ndebele, there are no clicks, but older language consultants "remember times" when clicks were used in speaking [Ziervogel 1959:33]. A very few plant names still show the clicks, e.g. mugqɔgɔlɔ , ŋqaxi. For the most part, however, this dialect of Ndebele has non-click sounds corresponding to clicks in other languages. For example, [kx'] is the normal development of Bantu *nk , but there are cases pointing to [kx'] as the development of the palato-alveolar click, symbolized as q in the Zulu orthography:

(14)   Ndebele   Zulu

    -kx'wala   -qala   'begin'

    -ɛŋkx'ɛla   -ɛqa   'jump over'

    -kx'edʒa   -qɛda   'get finished'

    -likx'anda   -iqanda   'egg'

Similarly, a nasal click is most often represented as [ŋ] in Ndebele:

(15)   -ŋanɛ   -ncanɛ   'small'

    -ɛŋɛŋɛ   -ɛnxɛñɛ   'elsewhere'

    -not'ula   -nqodula   'pull out'

There are no known cases of the reverse substitution, i.e. of clicks for non-clicks in normal linguistic evolution.[15]

    Notice that this type of evolution is exactly what markedness theory would predict. Lass claims that there is nothing "unnatural" about clicks in Zulu, voiceless lateral affricates in Nahuatl, front rounded vowels in Swedish, etc. Yet, we have seen that Lass' notion of family universal cannot be maintained. Clicks may be "natural" in some Southern Bantu languages in that they exist in these languages; in this regard markedness theory is not a theory of "naturalness evaluation". The grammars of Zulu and Xhosa work as well as the grammars of non-click

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    [15]It has already been mentioned that the only candidate for such a substitution is hlonipa .

Bantu languages. However, the evidence points to the clicks being more
"complex", more "costly", or simply secondary in those languages where
Lass claims they are natural.

The marked value of clicks is evidenced not only in diachronic
developments. Louw [1958: 157] has noted that in certain idiolectal
and dialectal varieties of Zulu, the clicks are replaced systematically
by other consonants and that the lateral click is disappearing in
general. Also, clicks are among the last sounds acquired by Zulu
children, being replaced by the corresponding non-clicks [Louw 1964;
A. Nkabinde, personal communication]. In fairy tales, the speech of
animals, usually represented as baby talk, is devoid of clicks [Jakobson
1958:35].

6. Conclusion

On the whole, Lass' notion of family universal and language-
specific markedness seems to contribute little to the solution of the
general questions which markedness theory was designed to address.
Lass claims that for non-click languages like English and Chinese, the
clicks are neither marked nor unmarked; they are simply not part of
the inventory, i.e. they are like teeth in chickens. Similarly, there
is nothing unnatural about clicks in click languages; these languages
are simply "that kind of beast". However, the evidence presented in
Section 5 clearly points to the clicks being marked in the Southern
Bantu click languages.[16] It would be difficult to explain the data of
diachronic developments, synchronic replacement, child phonology, etc.
otherwise. This points to an inherent difficulty in Lass' revision of
markedness and would seem to be a vindication, on a rather small scale,

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[16]Even in those languages where clicks are original elements,
Bushman and Hottentot languages, there are distributional restrictions
on the occurrence of clicks [Greenberg 1970:67]. Bleek [1939:61]
reports that many Bushman words with clicks coexist with clickless
variants and that certain words with clicks in the speech of older
speakers have lost these clicks with the younger speakers. Finally,
she observes that "most words that are very often in use such as
pronouns, demonstratives and verbal particles, have no clicks in all
the languages" indicating a "tendency to drop the clicks."

of the more orthodox theory of markedness. Despite the explanatory gap in the theoretical foundation of the theory, its predictions are borne out by the synchronic and diachronic language data.

Similarly, the Luganda data concerning geminates do not represent a significant indictment of markedness theory. As was shown in Section 3.3, all the geminates are attributable either diachronically or synchronically to an original sequence of segments. That Meinhof's Law and the process of infinitive prefix reduction give rise to surface geminates is not surprising since geminates are otherwise an important part of the Luganda sound system. What requires explanation is the fact that Luganda tolerates surface geminates, regardless of their source.

Katamba attempts to explain the presence of geminates by reference to the articulatory mode of the language. However, as was demonstrated in Section 3, the only evidence for the mode of Consonant Strengthening is the existence of geminate consonants. Thus, the reasoning involved in the analysis is inherently circular: the geminates exist because of a particular phonetic mode and the evidence for the phonetic mode is the existence of geminates. Similar reasoning is involved in the justification of the phonetic mode of Vowel Lowering.

I do not mean to suggest here that the concept of articulatory mode is inherently devoid of content. Obviously, this issue cannot be decided on the basis of data drawn from a single language. It seems plausible that the phonology of a language might be governed by general preferences for certain types of phonetic outputs in the same way that several processes in a language may conspire to produce CV syllable structure. However, the question is then how many processes define a meta-rule. Two? Three? Seven? It would not seem that the existence of a single process or single state can be used to argue for such general principles. In the absence of any theory of intrinsic content or an explanation for the existence of geminates in Luganda, all we can do at present is to note that Luganda is "that kind of beast", or, to make further use of Lass' metaphor, geminates in Luganda are like gizzards in chickens, i.e. simply part of the inventory.

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