Meinhof's Rule in Bantu Revisited; with special reference to Chibemba*

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Kim, Hyung-Soo. 1999. Meinhof's Rule in Bantu Revisited. *Linguistics* 7-2, 183-205. Well known to any Bantu phonologist is Meinhof's Rule, a dissimilation phenomenon observed between two nasal compounds in successive syllables. This paper analyzes application of this rule in Chibemba, a Bantu language spoken in Zambia. Chibemba has been previously classified by Meeussen(1963) and Meinhof(1932) as one of those Bantu languages in which the dissimilation rule occurs under a more limited condition. It is argued that such restriction is unnecessary in light of the data presented by Mann(1977). It is shown that the application of Meinhof's Rule in Chibemba occurs essentially under the same universal condition on dissimilation as in other Bantu languages, for example, Luganda. To place the analysis in proper context, I begin with discussion of Meinhof's Rule as a dissimilation; its interpretation, the mechanism of change, and the rule's condition and reflexes in Bantu languages. **(Jeonju University)**

1. Introduction

Occurring in many East African Bantu languages is a dissimilation rule between two noncontiguous nasal compounds. This rule is traditionally known as Meinhof's Rule, after the German philologist Carl Meinhof who first formulated the rule in Luganda:

"When two successive syllables both begin with a nasal plus

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following voiced plosive, the plosive of the first syllable is lost."[1]

The following points should be made immediately with regard to the above rule statement. First, although it states that the rule occurs only between two nasal compounds it is clear from the examples Meinhof gives in Ganda that he 'knew' that the rule is conditioned by a simple nasal as well as a nasal compound in the second syllable. This is also evident in his original formulation of the rule in German:

"Wenn auf die Verbindung eines nasals mit einem Stimmhaften Konsonanten in zweiter Silbe wieder eine Nasalverbindung oder ein Nasal folgt, so bleibt von der ersten Nasalverbindung nur der Nasal übrig."[2]

Secondly, as Meeussen (1963, p25) has correctly pointed out, the reflex of this dissimilation rule is not a simple nasal but a geminate nasal. In other words, the plosive just does not drop but rather assimilates to the preceding nasal, yielding a geminate nasal cluster.

The canonical form of the rule is therefore not

NCVNC ---> NVNC

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1 Meinhof 1932, p183. The rule has been known under various names. First its was called Ganda Law by Meinhof because it was in Luganda that C. T. Wilson first observed the phenomenon in 1882. Later, the name has been changed to Meinhof's Law because it was Meinhof who formulated the law. Meeussen(1963) however proposed that the name be changed to Meinhof's Rule because of the many exceptions the rule admits. This seems appropriate because the so called laws in historical linguistics are really phonological processes. For example, the most well known three laws in linguistics, i.e. Grimm's Law, Grassmann's Law and Verner's Law, in fact refer to phonological processes of (respectively) consonantal strengthening, dissimilation, and lenition. In this paper I therefore substitute all traditional names of law by rule.

2 Roughly translated, it says that if a nasal compound or a nasal follows another nasal compound, only the nasal remains of the first compound.

but rather

NCVN(C) ---> NNVN(C)

as well attested to by the following examples of Luganda:

ŋŋenda <*N-genda "I go" (cf. ogenda "you go")
mmumba <*N-bumba "I mould" (cf. obumba "you mould")
nninda <*N-dinda "I wait" (cf. olinda <*o-dinda "you wait")[3]

and

nnumye <*N-dumye "I have bitten" (cf. ku-luma "bite")
nnuŋamye <*N-duŋamye "I have led" (cf. ku-luŋamya "lead")
mmuna <*N-buna "I spread out" (cf. ku-buna "spread")

The first group of examples show the rule applying between two nasal compounds (NCVNC → NNVNC) while the second group show the same rule applying even though there is only a simple nasal in the second syllable (NCVN → NNVN). And both groups show that the reflexes of the rule is not a single nasal but a geminate nasal.

Various attempts have been made previously to account for this wide spread rule in Bantu. Most of these have been concerned with description of the rule in a particular language, but there were also interpretations made in which the phenomenon was viewed not as a dissimilation but as a deletion or an assimilation process. For example, Brown(1972) in analyzing the rule's application in Lumasaaba describes it as a simple deletion of a consonant: NCVN(C) ---> NVN(C), e.g. *imoni* <*i-N-boni* "an eye" (cf. *kaboni* "a small eye"). But this

3 The underlying **dinda*, rather than the traditional **linda*, is assumed here because there is no natural rule converting **nl* to *nd*, while there is a rule converting *d* to *l*. Cf. Lt. *lingua* from IE **dingua* (English *tongue*).

overlooks the fact that the reflex of the same rule in Ganda is a geminate nasal, as in the above Ganda *mmumba* <**N-bumba* "I mould". Herbert(1977, p341), on the other hand, has contended that what occurs in Meinhof's Rule is actually assimilation, as reflected in languages such as Ganda where there is assimilation between the nasal and the plosive:

> "...the thesis I shall put forward in this paper is that all cases involving the application of Meinhof's Rule are cases of assimilation uniquely"

In H-S Kim(1996), I have presented an alternative analysis of Meinhof's Rule in which I argue against Brown(1972) and Herbert(1977) saying that the phenomenon is best explained as a dissimilation process, as has been characterized by Meinhof. In this paper, I will first briefly summarize what has been presented in that paper as a background, then follow it up with analysis of some new data on Meinhof's Rule from Chibemba (sometimes also called Bemba), a Bantu language spoken in Zambia.

In Kim(1996) many details of the analysis have been left out, for various reasons such as lack of space and time. Among them I will consider two in this paper. First, I will examine the claims made in Meeussen(1963) and Meinhof(1932) concerning application of Meinhof's Rule in Chibemba; based on analysis of the data given by Mann(1970), I will demonstrate that the conditions on Meinhof's Rule in Chibemba and Luganda are essentially the same, being derived from the universal condition on dissimilation that dissimilation occurs preferentially between two sufficiently similar consonant clusters. Next, I will discuss a general constraint on internal structure of consonant clusters that undergo dissimilation in languages. It is shown that due to operation of this constraint, nasal plus homorganic voiceless clusters do not undergo Meinhof's Rule in Chibemba, as the data from Mann(1970) will again illustrate.

2. Meinhof's Rule as a dissimilation

In Theoretical Phonology(Foley 1977, 1981), dissimilation is interpreted as a process in which two similar consonants (or consonant clusters) become dissimilar when they are sufficiently similar.

$$C \S K \text{ ---> } C^{-} \S K^{+} \text{ where } |C\text{-}K| \leq d \text{ and } |C\text{-}\S| \geq D$$

In other words, in dissimilation the first of two similar consonants weakens, while the second consonant strengthens in consonance with the strength conservation principle. In dissimilation of consonant clusters such as Grassmann's Rule, e.g. Gk. *tithemi* <**thithemi*, the above rule will first weaken the resonant in the first of two sufficiently similar consonant clusters, followed by elision of the weakened element, as in

thithemi	
$th^{-}ith^{+}emi$	dissimilation: $C \S K \rightarrow C^{-} \S K^{+}$
$tith^{+}emi$	elision: $h^{-} \rightarrow \emptyset$ but $h^{+} \rightarrow$ idem

There are two conditions on dissimilation: 1) that the two consonants be sufficiently similar ($|C\text{-}K| \leq d$), and 2) that both consonants be sufficiently different from what comes in between($|C\text{-}\S| \geq D$). Since arguments for these conditions have already been presented elsewhere(H-S Kim 1995, 1998), they will not be repeated here. Of the two conditions on dissimilation, we will be mainly concerned with the first condition in this paper because the second condition does not play any role in our explanation of Meinhof's Rule in Chibemba.[4)]

4 As pointed out in a talk given by Nancy C. Kula and Lutz Marten at the 10th ALASA conference held in the University of South Africa, Pretoria, July 7-9, 1999, the usual rule of *NCVN(C)* --> *NNVN(C)* is blocked when a consonant intervenes between the two similar consonant clusters, e.g. *mbelengele* "I have

In phonological analysis, it is often important to distinguish between the underlying process and its surface manifestation, because confusion between the two can result in erroneous interpretation of phonological phenomenon, thus vitiation of an entire analysis. Both Brown's and Herbert's analyses have overlooked this important distinction. Brown obviously has regarded the single nasal reflex of the rule NCVN(C) → NVN(C) in Lumasaaba as the direct result of Meinhof's Rule, while Herbert has taken as basic the superficial assimilation occurring in examples of Meinhof's Rule in Luganda, despite Meinhof's appellation of the phenomenon as 'dissimilation of nasal compounds'. Both analyses have committed the error of taking what occurs on the surface at face value, without looking further into what lies underneath.

Consider, in this light, Grassmann's Rule, a well known dissimilation rule in Greek and Sanskrit. Most phonologists would agree that the essence of the process underlying it is dissimilative because an aspirate loses its aspiration when followed by another aspirate.[5] But if we just focus on the surface phonetic process, it would be also possible to say that what occurs is deaspiration. Such an interpretation would be

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read" <**n-belengele* (cf. Kula and Marten 1999). This suggests that the condition of sufficient difference may indeed play some role in application of Meinhof's Rule in Chibemba. After the conference I asked Nancy, who is a native speaker of Chibemba, whether there are any more examples like the one she provided. But she couldn't think of any at the time. Since coming back from the conference however, I checked Mann(1977) on page 7 of which I found *mbelame* "should I hide" (cf. belameeni "hide"). The form indeed confirms the rule's nonoccurrence when a consonant (in this case an *l*) intervenes in between. The matter however calls for further clarification because these are the only two examples so far found and both contain an intervening *l*.

5 One notable exception is Kiparsky(1973), who formulates a synchronic aspirate throw-back rule in place of the traditional dissimilation. Like deaspiration interpretation, however, the rule fails to relate to other dissimilation rules. See H-S Kim(1998) for an alternative analysis in which application of Grassmann's Rule in Greek is analyzed as an example of regular dissimilation.

however unfortunate because as was shown in Kim(1996), Grassmann's Rule and Meinhof's Rule share not only the same universal conditions but also the same mechanism of change, although they differ in their manifestation: the former manifesting by deaspiration while the latter, by assimilation.

Our strategy is thus to reestablish Meinhof's Rule as a dissimilation on the following arguments. First, we provide an alternative analysis to Brown's rule of consonant elision, in which we interpret the single nasal reflex of Meinhof's Rule in Lumasaaba arising as a result of subsequent degemination, maintaining the geminate nasal reflex as the correct surface output of the rule. Second, we show that Meinhof's Rule follows the same universal condition on dissimilation that dissimilation occurs between two sufficiently similar consonant clusters. Third, the different surface outputs of Grassmann's Rule (deaspiration) and Meinhof's Rule (assimilation) are explained under the mechanism of strength fluxion whose diverse manner of manifestation and change of direction result in diversity of surface phonetic outputs.

2.1. Relating the reflexes of Meinhof's Rule

That the reflex of Meinhof's Rule is sometimes a geminate nasal as in the above Luganda but sometimes a single nasal as in Lumasaaba *imoni* <**i-N-boni* should not worry us too much because the single nasal reflexes are the result of applying additional rule of degemination. Consider a comparative derivation of Ganda *ennimi* and Lumasaaba *zinimi* both plural forms of *lulimi* "tongue":

e-N-dimi	zi-N-dimi	
endimi	zindimi	nasal assimilation
ennimi	zinnimi	Meinhof's Rule: NCVN(C)→NNVN(C)
"	zinimi	degemination(in Lumasaaba only)

The argument for this assumption is based on two facts. First, it is

precisely in languages such as Lumasaaba where there is no surface geminate nasals that the result of Meinhof's Rule appears as a single nasal. This is because the would-be geminate nasals get automatically degeminated by the above rule of degemination. Compare the development of nasal clusters in Luganda *mmuli* <**N-muli* "reeds" (cf. *lumuli* "reed") and Lumasaaba *imuga* <**i-N-muga* "a calabash" (cf. *kamuga* "a small calabash"):

N-muli	i-N-muga	
mmuli	immuga	assimilation
"	imuga	degemination (in Lumasaaba only)

Second, positing this additional rule of degemination enables us to systematically relate the reflexes of Meinhof's Rule in different languages. For example, under the Brown's rule of consonant elision, i.e. NCVN →NVN, it becomes difficult to explain the assimilated reflex of the same rule in Ganda unless a separate rule is assumed, whereas the degemination analysis provides an insight that the single nasal reflex is a further development from the geminate nasal reflex, by degemination. The essential difference between the two languages is thus that Lumasaaba has the rule of degemination, which Ganda lacks.

This analysis makes two predictions concerning reflexes of Meinhof's Rule in Bantu: 1) that some languages would be like Ganda in showing a geminate reflex as a result of applying Meinhof's Rule, while others will be like Lumasaaba having undergone a further development through degemination and 2) that if the reflex of Meinhof's Rule is a single nasal in a language, then there is no surface geminate nasal in that language. These predictions are in fact borne out by examples of Meinhof's Rule in other Bantu languages. One language like Luganda with the geminate nasal reflex of Meinhof's Rule is Bemba, e.g. *innamba* <**i-N-damba* (cf. *ulu-lamba* "river-bank"), while a language like Lumasaaba with a single nasal reflex is Kikuyu in which no surface geminate nasals exist, e.g. *akeenoonda* <**akee-N-doonda*

"(and) he threw me down" (cf. *akeeroonda* "(and) he threw down")[6]

2.2. Conditions on Meinhof's Rule

Recall that a universal condition on dissimilation is that the two consonants should be sufficiently similar: $|C-K| \leq d$. As a dissimilation, Meinhof's Rule also follows the same universal condition on dissimilation. As a result of this condition, there are two versions of Meinhof's Rule applying in Bantu languages, one the preferential dissimilation which occurs when the two consonant clusters are sufficiently similar (i.e. between two nasal compounds) and the other, a generalized version of this preferential rule that applies when they are less similar (i.e. when there is only a simple nasal in the second syllable):

1) preferential Meinhof's Rule: NCVNC→NNVNC ($|C-K| \leq 0$)
2) generalized Meinhof's Rule: NCVN→NNVN ($|C-K| \leq 1$)

Thus there may be Bantu languages in which rule 1) occurs but not rule 2), or there may be languages in which rule 1) and rule 2) both occur. There may however be no languages which have rule 2) without also having rule 1). Thus there are languages reported in Meeussen(1963) that have rule 1) but not rule 2) but none reported that has rule 2) without also having rule 1).

Note that the same preferential condition also applies to the Kuanyama Rule[7] of dissimilation, which according to Meinhof(1932, p184) 'is the exact counterpart of the Ganda Law [i.e. Meinhof's Rule]':

> "When two successive syllables both begin with a nasal and a following plosive, the nasal of the second compound is dropped."

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6 Kikuyu data from Meeussen(1963, p26). See also Barlow(1946, p5).

7 In keeping with the terminological preference for rule to law, I call the rule by this name rather than the one originally given by Meinhof.

In other words, the canonical form of the rule here is NCVNC → NCVC. Consider

Kuanyama	Herero	
oŋgadu <*oŋgandu	oŋgandu	"crocodile"
oŋgobe <*oŋgombe	oŋgombe	"beast"
ombabi <*ombambi	ombambi	"steenbuck"

Here we are concerned with the condition of dissimilation in the examples of the so called Kuanyama Rule. To answer the question why the nasal in the second nasal compound drops, rather than undergoing assimilation with the following plosive, we consider the reflex of dissimilation first, and then the direction of dissimilation mechanism.

2.3. The Reflexes of Dissimilation

It is usual in dissimilation of consonant clusters that the more resonant member of the consonant cluster drops, as the following rules of dissimilation in Greek (Grassmann's Rule) and Spanish illustrate:

ChVCh → CVCh as in Gk. tithemi <*thithemi
CLVCL → CVCL as in Lt. triplus Sp. tiple

The relative resonancy is determined on the Rho phonological parameter[8]

Rho t s n l y
1 2 3 4 5

(*t* for stops, *s* for fricatives, *n* for nasals, *l* for liquids, and *y* for glides)

8 See Foley(1977) for arguments for this and other strength parameters used in the paper.

Thus according to the above observation, it seems natural that elision of a nasal should occur by Kuanyama Rule, i.e. NCVNC → NCVC, except that it is the nasal of the second, rather than the first, compound that drops by the rule. But then what about the reflex of geminate nasal that results by Meinhof's Rule? To answer both of these questions, we turn to the direction of dissimilation.

2.4. Direction of Dissimilation

As illustrated in the above examples of dissimilation, the normal direction of dissimilation is that the first of two sufficiently similar consonant clusters weakens with eventual elision of the weakened resonant member of the cluster. That the Kuanyama Rule drops the second nasal of the second nasal compound rather than the first therefore suggests that this normal direction of dissimilation,

$$C \S K \rightarrow C^{-} \S K^{+}$$

has been reversed in Bantu to

$$C \S K \rightarrow C^{+} \S K^{-}$$

Under this reversed direction of dissimilation mechanism, the second of two similar consonant clusters rather weakens while the first cluster strengthens in consonance with the strength conservation principle, as in

$$NCVNC \text{ ---> } N^{+}CVN^{-}C$$

In Kuanyama Rule, it is the weakened nasal that manifests, by eliding as in, e.g. Kuan. *oŋgadu* <**oŋgandu*. In Meinhof's Rule, e.g. Ganda *ŋŋenda* <**N-genda*, it is rather the strengthened nasal that manifests, by undergoing syneresis with the following plosive, which eventually shows up as a geminate nasal by assimilation:

$N^{+}C$ --> $\widehat{NC}$ --> NN

Syneresis here facilitates preferential assimilation by combining the nasal plus plosive cluster more tightly bound, as in, for example, Lt. *lumbus* Sp. *lomo* "loin" but Lt. *mundus* Sp. *mundo* "world" and Lt. *longus* Sp. *luengo* "long" where the strong cluster *mb* first undergoes the strengthening process of preferential syneresis, facilitating preferential assimilation of *mb* → *mm* with subsequent degemination, as in

lumbus	mundus	loŋgus	
lum͡bus	"	"	syneresis: mb→m͡b but nd, ŋg→idem
lummus	"	"	assimilation
lumus	"	"	degemination
lomo	mundo	lueŋgo	MR

The same syneresis also occurs in examples such as Ganda *ŋŋenda* <**N-genda* "I go", which as in the above Spanish nasal assimilation, induces preferential assimilation:

ŋ-genda	
ŋ$^{+}$gen^{-}da	strength fluxion
ŋ͡gen^{-}da	syneresis
ŋŋenda	preferential assimilation: ŋ͡g→ŋŋ but nd→idem

As an example of similar reversal of direction of dissimilation, note that in the so called *ri-* and *rə*-irregular predicates in Korean the second liquid drops by dissimilation with the first liquid, as in

declarative -ta	infinitive -a/ə	
phiri-ta <*phirir-ta	phirir-ə	"blue"
nuri-ta <*nurir-ta	nurir-ə	"yellow"

The rule that occurs here is a generalized version of dissimilation between liquid clusters, i.e. LVLC → LVC. The reason why the second liquid drops is because the second liquid is in a consonant cluster, thus inherently weaker than the first liquid.[9] Since it is weaker, it is more likely to undergo further weakening. Hence the reversal of the dissimilation mechanism.

It is remarkable that although the surface reflexes of Kuanyama Rule and Meinhof's Rule are quite different, the former being elision but the latter assimilation, both rules occur essentially under the same mechanism of strength fluxion. Moreover, both rules are governed by the same universal condition that dissimilation occurs between two sufficiently similar consonant clusters. In the following, we will be drawing a similar conclusion on Meinhof's Rule in Chibemba in spite of the exceptional statements made by Meinhof and Meeussen.

3. Meinhof's Rule in Chibemba

According to Meeussen(1963, p27), Chibemba appears to be one of those languages that possess preferential Meinhof's Rule:

> " In central Bantu **Meinhof's rule** is found not only in Bemba, but in a probably continuous area including also Luba-Katanga, Hemba, Sanga, Tabwa, Lamba, Ila, and Soli. In all these languages **the rule applies only if there is a nasal compound in second position...**"[10]

In the next line, however, Meeussen adds that:

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9 Lack of space prohibits further explanation, for which readers are referred to H-S Kim(1995, p407)

10 All the emphases by way of baldface in this and other quotes that follow it are mine.

> "A few additional features require further attention... **in Bemba and Lamba the second nasal compound may be voiceless...**"

According to Meinhof (1932, p184), on the other hand, Bemba is one of those languages in which velar nasal compounds are not affected by the rule:

> "The Ganda Law[i.e. Meinhof's Rule] has also been found in other languages, especially in Bemba, where *n+l>nd*, but under Ganda Law *nn*, *n+b>mb* but through dissimilation *mm*, e.g. *annaŋgila* for **andaŋgila* "he showed me", *wammombela* for **wambombela* "you work for me", *innembo* 9 for **indembo* "tattoo marks" from *-lemba*, *ulubansa* 11, pl. *immansa* for **imbansa* "courtyard". **The nasal compound ŋg does not, however, seem to be affected by the Ganda Law in this language.**"[11]

Of the languages that Meeussen mentions as languages where the preferential Meinhof's Rule applies, only data on Bemba are available, from Mann(1977). I will show below that Bemba does not belong to the group of languages in which preferential Meinhof's Rule occurs. No handbooks are available for the rest of the languages, which will be thus left for future research. Once we realize that the Meinhof's Rule that occurs in Bemba is rather a generalized version of preferential Meinhof's Rule, Meeussen's remark that in Bemba the second nasal compound may be voiceless loses its pertinence because what is required for the rule to occur is only a nasal in the second syllable. Again we are unable to check the data for Lamba, which is therefore

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11 This quote from Meinhof 1932 is interesting because unlike Ganda data he provides on the preceding page, the Bemba data here clearly shows the geminate nasal reflex of Meinhof's Rule. It is however not certain whether he has overlooked this fact or just disregarded it as unimportant.

left for future research.

Meinhof's statement that in Bemba, the nasal compound *ŋg* does not seem to be affected by the rule is also false, as the following quote from Mann(1977, p10),

> " We find *mm* instead of *mb*, and the similar changes *nn* instead of *nd*, *ŋŋ* instead of *ng* ... when the next syllable has a nasal compound, **and in some words also when the next consonant is a single nasal.**"

and the data that follows it,

singular	plural	
ulubansa	immansa	"court-yard"
ululamba	innamba	"river-bank"
uluuni	iŋŋuni	"honey-guide bird"

clearly shows. In these examples, Meinhof's Rule in Bemba occurs not only between two nasal compounds, e.g. *innamba* <**indamba* (cf. *ululamba* <**ulu-damba*) but also between a nasal compound and a simple nasal, e.g. *iŋŋuni* <**iŋguni* (cf. *uluuni* <**ulu-ɣuni*). The third example is particularly important because it also shows that Meinhof's Rule also occurs to the velar nasal compound in Bemba, thus refuting Meinhof's statement that the cluster *ŋg* is not affected by the rule. Consider the following derivation:

ulu-ɣuni	ini-ɣuni	
"	inɣuni	syncope of i in preference to u
"	iŋguni	assimilation
uluuni	"	lenition:ɣ → ø / V ___ V
"	iŋŋuni	Meinhof's Rule: NCVN(C) → NNVN(C)

Note also the following conditional forms:

imperative plural[12]	conditional
bombeeni "work"	mmombe "should I work"
lembeeni "write"	nnembe "should I write"
umfweeni "listen"	ŋŋumfwe "should I listen"

As in the above *ululuni* <**ulu-yuni* the underlying stem in the third example begins with a voiced velar fricative, which drops in the imperative but assimilates with the preceding nasal. Meinhof's Rule then occurs to this assimilated nasal compound as in

N-ɣumfwe	
ŋɣumfwe	nasal assimilation
ŋgumfwe	manner assimilation
ŋŋumfwe	Meinhof's Rule

As an argument hat the vowel initial verb roots in Bemba indeed begin with a velar fricative (or a stop), consider again the quote from Mann(1977, p9):

> "Where the verb root begins with a vowel or a semivowel, *g* or *j* are inserted, *g* before *o, u,* or *w, j* before *e, i,* or *y* for instance *ng-owe* 'should I swim', *ng-ube* 'should I shelter', *ng-we* 'should I fall over', *nj-eshe* 'should I try', *nj-ipushe* 'should I ask', *nje* (from *nj-ye*) 'should I go'; before a, some speakers say *g,* others *j,* for instance *njafweeniko* or *ngafweeniko* 'help me'."

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12 The imperatives should also undergo the generalized Meinhof's Rule according to the conditions revised here. But the imperative ending *-eeni* seems to be outside the domain of the rule, presumably because these are of periphrastic origin. Note, for example, in Greek imperative with -thi, Grassmann's Rule occurs under a more restricted condition, i.e. between identical aspirates in preference to nonidentical aspirates, e.g. Gk. *sotheti* <**so-the-thi*, Gk. *lutheti*<**lu-the-thi* but *pha-thi*, *graphe-thi*, etc. For more details, consult H-S Kim(1990, p75).

An easy way to explain the emergence of the velar stop in the so called vowel initial verbs prefixed with a nasal would be to assume an underlying velar consonant as the initial consonant of these verbs, as in *ngowe*<**N-ɣowe*, *ngube*<**N-ɣube*, *ngwe*<**N-ɣue*. This reconstruction of *ɣ* makes sense because once we have a velar consonant reconstructed, the palatal nasal compounds in *nj-eshe* <**N-ɣeshe* *nj-ipushe*<**N-ɣipushe*, *nje*<**N-ɣie* are easily explained by a palatalization rule such as

g --> ʤ / ___i, e

as illustrated in the following derivation:

N-ɣowe	N-ɣie	
ŋɣowe	ŋɣie	nasal assimilation
ŋgowe	ŋgie	manner assimilation
"	ŋʤie	palatalization
"	ɲʤie	place assimilation

Notice that some of the above reconstructions well correspond to Meinhof's own reconstruction of Ur-Bantu roots. Corresponding to Bemba *nje* <**N-ɣie* "should I go" is UB **ɣia* "go" while Bemba *ngwe* <**N-ɣue* "should I fall over" corresponds to UB **ɣua* "fall". (Cf. Meinhof 1931, p190-192).

Once we realize that Meinhof's Rule applies in Bemba even when there is only a nasal in the second syllable, then there is no need to add that 'the second nasal compound may be voiceless'. If Meeussen meant the second nasal compound being voiceless to refer to cases such as *immansa* <**ini-bansa*, we no longer need to add such a statement to the rule because what is needed to trigger the rule in Bemba is only a nasal in the second syllable.

3.1 A Constraint on Meinhof's Rule in Chibemba

Data such as the following, which is also from Mann(1977, p8), suggest that there is another constraint operating on Meinhof's Rule in Bemba. Consider

imperative plural	conditional	
konkeeni "follow"	nkonke	"should I follow"
tampeeni "begin"	ntampe	"should I begin"
cindeeni "dance"	ncinde	"should I dance"

In these examples Meinhof's Rule fails to occur even though the consonant clusters are similar enough to satisfy the above preferential and the generalized conditions on dissimilation. For example, in *nkonke* < **N-konke* the two nasal compounds both contain a nasal plus a voiceless consonant, so it satisfies the preferential condition $|C-K| \leq 0$. In examples such as *ncinde* <**N-cinde* the two nasal compounds differ by one unit because the plosive is voiceless in the first compound but voiced in the second, so we could say it satisfies the generalized condition $|C-K| \leq 1$. It thus appears that these examples are counter to the conditions on Meinhof's Rule in Chibemba stipulated above.

Perhaps for these reasons, Meinhof has limited the domain of his rule to cases of 'a nasal plus a following voiced consonant', and we could of course just do the same. But such a restriction on Meinhof's Rule would not answer our question, for then the next question is why clusters of a nasal plus a voiceless stop are excluded from the rule's domain.

The explanation that will be put forth in this paper is that the restriction is a result of another constraint that applies to dissimilation of consonant clusters in general. This constraint, which we consider under a separate heading, concerns the internal nature of the consonant clusters that undergo the dissimilation process.

3.1.1 The Internal Structure of Consonant Clusters in Dissimilation

In Kim(1990) I have presented various examples of dissimilation occurring to consonant clusters in languages of the world. Listed below are a sample of examples drawn from that work:

1) consonant plus glide clusters, i.e. CGVCG → CVCG
C^h § Ch → C § C^h: Gk. tit^hemi <*t^hit^hemi
C^w § C^w → C § C^w: Lt. ***quinque*** Sp. *cinko* "five"
(cf. Lt.*quintus*Sp. *quinto*[kinto] "fifth")
C^y § C^y → C § C^y: Gk. $kektemai$ <*k^yek^yemai
(cf. Gk. ktaomai <*k^yaomai, Skt. ksayati)

2) consonant plus liquid clusters, i.e. CLVCL → CVCL:
Spanish:

Latin	Spanish	
prosternare	postrar	"prostrate"
triplus	tiple	"treble"
flebilis	feble	"feeble"
tremulare	temblar	"tremble"

Gothic reduplicated perfects:

infinitive	perfect		
fraisan	faífrais	<*fraífrais	"attempt"
gretan	gaígrot	<*graígrot	"weep"
slepan	saíslep	<*slaíslep	"sleep"

Sanskrit reduplicated forms:

Skt dadrus	<*dra-drus	"ran"
Skt sisriyé	<*sri-sriyé	"rested on"
Skt sasmāra	<*sma-smāra	"remembered"
Skt sasnau	<*sna-snau	"bathed"

One thing we notice about the above consonant clusters that undergo dissimilation is that they are all consonant plus resonant clusters, and as such they have the internal structure of two consonants tightly bound together. The same is also true in the case of Meinhof's Rule in Bantu where the nasal compounds are composed of a nasal, which is a resonant, and an homorganic plosive. As prenasalized consonants, the internal elements of nasal compounds are also tightly bound together, often functioning as one unit. Referring to Foley's scale of Gamma strength(cf. Foley 1977, p39), we can therefore say that the canonical form of the consonant cluster most likely to dissimilate has the gamma strength of 2:

$(C, h)_2 = C^h$
$(C, w)_2 = C^w$
$(C, y)_2 = C^y$
$(C, l)_2 = C^l$
$(C, r)_2 = C^r$
$(N, C)_2 = {}^NC$

3.1.2 Preferential Syneresis

Syneresis, as mentioned earlier, is a phonological process by which phonological elements become tightly bound together. We have seen earlier in the paper that certain phonological processes such as assimilation are sometimes facilitated by syneresis. A universal condition on syneresis is that it occurs between sufficiently similar elements. Under this condition, for example, between homorganic clusters of *nd* and *nt*, syneresis would occur first to the former in preference to the latter because a nasal, which is voiced, plus a voiced plosive is more similar to each other than a nasal plus a voiceless plosive. Thus the process of syneresis could occur more readily to the former than the latter, to which only the generalized syneresis occurs:

nt	nd	
"	n͡d	1) preferential syneresis
n͡t	"	2) generalized syneresis

In Bemba and many Bantu languages that do not permit dissimilation between nasal plus a voiceless plosive clusters, Meinhof's Rule must have occurred between these two syneresis rules. Consider the following derivation:

ndembo	ntampe	
n͡dembo	"	1) preferential syneresis
nnembo	"	Meinhof's Rule
"	n͡tampo	2) generalized syneresis

This syneric bonding has the effect of making the cluster more tightly bound, with the Gamma strength of 2. Prenasalization is nothing more than this bonding process between a nasal and a plosive. We conclude that this is the reason why dissimilation of consonant clusters occurs in Bemba to homorganic clusters of a nasal plus a voiced plosive in preference to clusters of a nasal plus a voiceless plosive.

4. Conclusion

In this paper I have reanalyzed application of Meinhof's Rule in Chibemba, a Bantu language spoken in Zambia. In particular, the following statements made previously by Meeussen(1963) and Meinhof(1932) concerning the rule has been shown to be incorrect:

1) that Meinhof's Rule applies in Bemba only when there is a nasal compound in the second position. It turns out that like other Bantu languages such as Lumasaaba and Luganda, the preferential Meinhof's Rule (i.e. NCVNC→ NNVNC) has generalized in Bemba by relaxing the similarity condition on

dissimilation, as *NCVN(C)→ NNVN(C).*

2) that the nasal compound *ŋg* is not affected by the rule in Bemba. That this statement is false has been shown by examples such as *iŋŋuni* <*iŋguni* "honey-guide bird" where *ŋgVn → ŋŋVn.*

3) that the second nasal compound may be voiceless in Bemba. This has become a moot statement because the condition on Meinhof's Rule in Bemba no longer needs a nasal compound in the second position but only a nasal.

In addition, I have explained nonapplication of Meinhof's Rule between nasal compounds with voiceless plosives in Bemba by considering the internal structure of the consonant clusters that undergo dissimilation.

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