THE ORIGINS OF 'COMPENSATORY LENGTHENING' RULES IN MICRONESIAN LANGUAGES

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In studies of Micronesian (MC) languages, considerable attention has been paid to what most linguists working in this area have traditionally — and I believe mistakenly — called 'compensatory lengthening'.[1] The nature of this phenomenon is illustrated by the following examples from Ponapean (PNP).

Base	Construct Form	Free Form	Gloss
*kili	kilin	ki:l	*skin*
*seti	setin	se:t	*sea*
*mwarɛ	mwarɛn	mwa:r	*title*
*ɔsɛ	ɔsɛn	ɔ:s	*thatch*
*roŋɛ	roŋɛn	ro:ŋ	*news*
*umwi	umwin	u:mw	*earth oven*

The base forms listed in the first column represent, depending upon one's theoretical persuasion, either the synchronic underlying forms of these morphemes or historically earlier forms arrived at through internal reconstruction. The construct forms of these morphemes (meaning 'X of'; therefore, 'skin of', 'sea of', etc.) are derived by suffixing ni to the base and deleting the final vowel. The free forms of these morphemes differ from their corresponding base forms in two respects.

(1) The final vowel of the base is deleted.

(2) The first or remaining vowel of the base is lengthened.

Thus, all short base vowels are lost before word boundary in PNP. Lengthening, however, operates only on the first vowel of a disyllabic base of the shape (C)V(C)V. The construct forms of the morphemes do not exhibit lengthening, nor do the free forms of bases of shapes other than (C)V(C)V. Note, for example, the following forms.

Base	Free Form	Gloss
*nsara	nsar	*snare*
*ɛmpi	ɛmp	*coconut crab*
*aramasa	aramas	*person*

An excellent summary of the history of the study of such vowel lengthening in MC languages is provided by Bender (1973), who notes that the earliest account

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of this phenomenon was provided by Dyen. Dyen (1949:423) observes that the double or long vowels in the free forms of earlier disyllabic words in Trukese (TRK) can "be traced directly to compensatory doubling.... The last vowel was lost and the preceding only vowel of the word was doubled". Although Dyen (1949:423) does not make explicit which TRK word classes undergo compensatory doubling, all of the examples he cites are nouns. He does observe that denominal verbs as well as nouns in close fusion with prepositions do not undergo compensatory doubling "because any such word was part of a closely connected sequence, and the sequence was longer than a monosyllable". He gives these examples, using q for what is today spelled pw.

qiin	*night*
qini-n	*night of*
ja a qin	*it is night*
nee qin	*at night*

Bender (1971:440-441) notes that in TRK

> both consonants and vowels occur long (doubled and short, although some vowel length is inherent... and other vowel length is compensatory..., the result of a late stage rule requiring independent forms of some word classes to have the equivalent of two syllables.

Again, which word classes undergo compensatory lengthening (Dyen's compensatory doubling) is not discussed.

So far as I am aware, the earliest formulation of a rule that restricts this lengthening to a specific word class was provided by Irwin Howard at the University of Hawaii at Manoa. Using TRK data in problem sets for his phonology classes, Howard not only specified nouns as the word class this rule of lengthening operates on, but also demonstrated that, within a generative framework, a number of facts about TRK phonology could be more effectively accounted for if one ordered lengthening prior to final vowel deletion. What had previously been assumed to be compensatory lengthening was shown by Howard to indeed be, at least synchronically, anticipatory lengthening (Bender 1973:467-469).

My own work on PNP phonology in the early 1970's (Rehg 1973) mirrored Howard's analysis of TRK and ordered lengthening prior to final vowel deletion. The following three rules, informally stated and somewhat simplified for this presentation, exhibit the ordering of the PNP rule of lengthening in relation to final vowel deletion as well as to a rule of raising.

Rule 1: Lengthening

$$[\#(C)V(C)\#]_N \quad \Rightarrow \quad [\#(C)V{:}(C)V\#]_N$$

This rule lengthens the first vowel of an unaffixed disyllabic noun.

Rule 2: Raising

$$\begin{bmatrix} a \\ -long \end{bmatrix} \quad \rightarrow \quad \varepsilon \; / \_\_\_\_ (Ci)(C)i\#$$

This rule raises short /a/ to /ɛ/ when the final vowel in a word is a high front vowel, providing that no vowel other than /i/ intervenes.

Rule 3: Final vowel deletion

$$V \quad \rightarrow \quad \emptyset / VC(V) \_\_\_\_ \#$$

This rule deletes a final vowel before word boundary.

I will not attempt to justify the particular form of these rules. In fact, I am now reasonably confident that, as a synchronic account of PNP, they are in error. But, as the following sample derivations illustrate, it is clear that lengthening must precede raising (so as to block raising in certain forms) and that raising must precede final vowel deletion (since the rule of raising includes this final vowel in its environment).

		ina	ina+ni	laŋi	laŋi+ni	laŋi+na
		mother	*mother of*	*sky*	*sky of*	*cloudy*
Rule 1:	Lengthening	i:na	--	la:ŋi	--	--
Rule 2:	Raising	--	inɛ+ni	--	lɛŋi+ni	--
Rule 3:	Final vowel deletion	i:n	inɛ+n	la:ŋ	lɛŋi+n	laŋi+n

Lengthening, raising, and final vowel deletion rules interact in a parallel manner in TRK.

It has been assumed that lengthening in all MC languages which exhibit this phenomenon could be accounted for in essentially the same manner as it is accounted for in PNP. Yet, I think that all Micronesianists have in fact been troubled by this account of lengthening. Indeed, it is reminiscent of a cartoon I recently saw. In this cartoon, a mathematician is standing before a large blackboard that is filled with a long, complex proof. In the middle of this proof is the phrase "and then a miracle occurs". At least two aspects of this account of lengthening strike me as mysterious, if not miraculous. The first is, if lengthening has anything to do with final vowel deletion, then how could it literally be anticipatory? I do not believe that languages, any more than the people who speak them, have the ability to see into the future. The second is, why should this rule of lengthening apply only to nouns? It is obvious that lengthening requires further explanation and investigation.

With respect to the issue of rule ordering, it is clear that historically at least, lengthening did precede final vowel deletion. For example, in some western Trukic (TK) languages, base final vowels are retained as voiceless vowels; nevertheless, lengthening of the first vowel of disyllabic bases still occurs, as illustrated by the following examples from Woleaian:

Base	Free Form	Gloss
laŋo	la:ŋo̤	*fly*
yafi	ya:fi̥	*fire*
ita	i:te̥	*name*
mata	ma:te̥	*eyes*
rigi	ri:gi̥	*running* (noun)

Ward Goodenough has also pointed out (personal communication) that, in Kiribati (Gilbertese) (KIR), the only base-final vowels that undergo deletion are high vowels after a nasal. Nevertheless, a similar pattern of lengthening exists in this language, as illustrated by the following examples.

te mata	*eye*
matana	*his eye*
ma:ta	*eyes*

The plural translation *eyes* for the form ma:ta indicates that when a noun is used without the article, or is in no other way modified, it is given a generic

reading. It should also be noted that KIR lengthening affects surface monosyllables as well as disyllables, as illustrated by the next examples.

te tona	to:na	*yaws*
te umwa	u:mwa	*house*
te ika	i:ka	*fish*
te pen	pe:n	*ripe coconut*

But, as in TRK and PNP, KIR lengthening does not affect bases of greater length.

te pwapwai	pwapwai	*root of a taro-like plant*
te mwmwaane	mwmwaane	*man*

Based upon evidence from western TK languages and KIR, it thus seems clear that, diachronically, lengthening did precede final vowel deletion. However, the issue of whether or not this lengthening has in fact anything to do with final vowel deletion is not resolved by these data. I will return to this issue later.

The order of lengthening with respect to final vowel deletion was one of the "mysteries" to which I referred earlier. The other was the fact that lengthening, as commonly described for TRK and PNP, is presumed to apply to nouns only. With regard to this concern, data from KIR are again particularly interesting, since it is *not* true in KIR that lengthening is so constrained. Note the following examples:

E piri	*He ran.*	Pi:ri!	*Run!*
E nako	*He went.*	Na:ko!	*Go!*
E siku	*He stayed.*	Si:ku!	*Stay!*
E kipa	*He jumped.*	Ki:pa!	*Jump!*

These forms illustrate that when a disyllabic verb occurs alone in a phrase, the first vowel of the verb undergoes lengthening. Verbs thus behave precisely as nouns do. Therefore, as with nouns, lengthening does not apply to verbs of three or more syllables, as demonstrated by these examples:

E osinako.	*He went out.*	Osinako!	*Go out!*
E anene.	*He sang.*	Anene!	*Sing!*

In KIR, therefore, lengthening is not constrained to apply only to nouns. A closer examination of PNP reveals that, in fact, lengthening is not so constrained in this language either. While verbs never undergo lengthening, other word classes do, as illustrated by PNP reflexes of the following Proto-Micronesian (PMC) forms.

INDEPENDENT PRONOUNS

PMC	PNP	
*ia	i:	3rd pers. sing.
*kit'a	ki:t'	1st pers. excl.

Since independent pronouns never occur with affixes or in combination with other words in a phrase, they do not exhibit alternations of length however.

NUMERALS

e:w	*one* (independent form)
yew	*one* (enclitic form)

POSSESSIVE FORMS

a:y	*mine*
ɛy	*my*
a:mw	*yours*
omw	*your*
a:	*his*
ɛ	*his*

QUESTION WORDS

ta:	*what (What is this?)*
ta	*what (What kind is this?)*
i:s	*who*
isime	*who*

What all of these word classes have in common, along with nouns, is that they may occur alone without further modification in a noun phrase. When alone, they have a long vowel; when not alone, they have a short vowel. Only words having the potential to stand alone in noun phrases in PNP exhibit this kind of lengthening.

The examples from KIR and PNP suggest that, diachronically, lengthening of the first vowel of a disyllabic morpheme was a *phrase* governed phenomenon, not a *lexically* governed one. Therefore, the origins of lengthening might be explained in terms of the phrase. Two related explanations come to mind.

The first is that in a language ancestral to PNP, KIR, and the TK languages (as well as possibly to other MC languages), a constraint existed to the effect that all phrases had to be minimally trimoric. Since all lexical items belonging to major word classes were apparently minimally disyllabic in this language (as in Proto-Oceanic), noun phrases were normally at least trimoric as a consequence of the presence of an article. Verb phrases, too, normally contained at least three mora because of the presence of a subject pronoun. When disyllabic nouns were used generically, with no further modification, or when disyllabic verbs occurred in commands, with the deletion of the subject pronoun, the constraint that phrases be minimally trimoric was satisfied by lengthening the first vowel of the disyllabic base.

The preceding account of the origins of lengthening is not entirely satisfactory, however, for the simple reason that it fails to explain why it is the *first* vowel of a disyllabic base that lengthens. Three mora could just as easily be arrived at by doubling the last vowel, by adding a prothetic vowel, by doubling a medial consonant, etc. The observation that phrases must have been minimally trimoric in some ancestral Micronesian language is better explained, I believe, as a consequence of the interaction of the following two quite natural rules (in which ‖ marks phrase boundary).

STRESS ASSIGNMENT

V → [+stress]/____(C)V‖

PHRASE INITIAL STRESSED VOWEL LENGTHENING

V → [+long] ‖ (C)____

The first rule assigns primary stress to the penultimate vowel of a phrase. Penultimate stress is the expected position of stress for Oceanic languages, and I have argued elsewhere (Rehg 1978) that one must assume such a stress pattern

for Proto-Ponapeic to account for certain vowel deletion phenomena that take place in Mokilese, a Ponapeic language. The second rule lengthens a stressed vowel when it is the first vowel in a phrase. Many phonetic arguments can be brought to bear in support of the naturalness of this rule, including the heightened air pressure that exists at the onset of a breath group, the common occurrence of phrase-initial stress in many languages, and the expected (but not inevitable) pattern of stressed vowels having greater duration than unstressed vowels. These two rules, then, might account for the genesis of the lengthening of disyllabic bases in MC languages. When the phrase was only two syllables long, the stressed vowel occurred in phrase-initial position and was thus lengthened. If the phrase contained more than two syllables, the stressed vowel was never in phrase-initial position, and was thus *not* lengthened.

The preceding discussion, if correct, renders vacuous the issue of whether the lengthening of disyllabic bases was anticipatory or compensatory with relation to final vowel deletion. Such lengthening quite probably had nothing to do with final vowel deletion. In contemporary KIR, for example, it is not the loss of a final vowel which triggers lengthening, but rather the position of a stressed vowel in relation to the beginning of the phrase. Thus, a surface monosyllabic form will contain a short vowel in a phrase like te pén *the ripe coconut*, but will have a long vowel in a generic phrase such as pé:n *ripe coconuts*. It is presumably the case, therefore, that in modern KIR stress is assigned prior to final vowel deletion, or the rule governing stress has been modified to the form $V \rightarrow [+\text{stress}] / \_\_\_\_ (C)(V) \|$. The presence or absence of final vowels in surface forms plays no role in determining when lengthening applies.

While lengthening in KIR can possibly be accounted for by only slightly modifying the two rules presented earlier, it is quite clear that these rules will not suffice for contemporary PNP nor for the TK languages. How synchronic lengthening is to be accounted for in PNP is a problem I am currently investigating, but for which I have not yet arrived at any satisfactory solution. Thus, the resolution of this issue must be considered at another time.

The final point I wish to cinsider here concerns the relative antiquity of phrase-initial stressed vowel lengthening. As Bender (1973) noted, the lengthening of disyllabic bases occurs in all TK languages, in KIR, and, I believe, must certainly have been a feature of Proto-Ponapeic. Two modern Ponapeic languages — Mokilese and Pingelapese — no longer exhibit such alternations in length, but evidence exists that they once did. Geoffrey Nathan has reported (personal communication) that sporadic lengthening exists in Nauruan, and Kee-dong Lee and Judith Wang have observed that all monosyllabic bases have long vowels on the surface in Kosraean, at least when those bases are uttered in isolation. So far as I am aware, only Marshallese fails to offer evidence for the existence of an earlier rule of phrase-initial stressed vowel lengthening. Whether or not this observation will prove useful in determining subgroupings within the MC family of languages remains to be seen, but it is a line of inquiry worthy of further investigation.

NOTE

1. An earlier version of this paper was presented to the Diachronic Linguistic Festival at the University of Hawaii in November of 1979.

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