A FRESH LOOK AT NABAK MORPHOPHONEMICS

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0. Introduction

A tagmemic analysis of Nabak phonology (see Fabian, Fabian and Peck 1971:158-9, hereafter F&P) yields the segmental consonantal phonemes of Table 1.2

<table>
<thead>
<tr>
<th>Phonemes:</th>
<th>p t k b d g kw gw w y l s z m n n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allophones:</td>
<td>p t k b d g kw gw w y l s dz m n n</td>
</tr>
<tr>
<td>Syllable</td>
<td>p t k b d g kw gw w y l ts dz m n n</td>
</tr>
<tr>
<td>initially</td>
<td></td>
</tr>
<tr>
<td>Syllable</td>
<td>p t k b d g kw gw w y l s dz m n n</td>
</tr>
<tr>
<td>finally</td>
<td></td>
</tr>
<tr>
<td>before</td>
<td>p t k b d g kw gw w y l s dz m n n</td>
</tr>
<tr>
<td>voiceless</td>
<td></td>
</tr>
<tr>
<td>stops</td>
<td></td>
</tr>
<tr>
<td>or pause</td>
<td></td>
</tr>
<tr>
<td>Intervocally</td>
<td>p t k b d g kw gw w y l s dz m n n</td>
</tr>
<tr>
<td>Syllable</td>
<td>p t k b d g kw gw w y l s dz m n n</td>
</tr>
<tr>
<td>initially</td>
<td></td>
</tr>
<tr>
<td>or finally</td>
<td>p t k b d g kw gw w y l s dz m n n</td>
</tr>
<tr>
<td>adjacent</td>
<td></td>
</tr>
<tr>
<td>to nasals</td>
<td></td>
</tr>
</tbody>
</table>

Allophonic variation: The labialized velar stops kw and gw freely fluctuate with their labiovelar counterparts kp and gb; z fluctuates freely with dz, and these follow, but do not precede nasals; l fluctuates with r, and v with w; y fluctuates with g intervocally between identical vowels. The vowel phonemes are i [i, i], e [e, ë, æ], a [a, ã], ɔ [ɔ], o [o] and u [u].

In the consonantal coda of Nabak syllables there is no contrast between the voiceless stops, p, t, k, the voiced stops b, d, g and the phonemes w and l.3 This neutralization results in morphemes ending in voiceless stops, when followed by pause, having other variants depending upon the phonological environment: [zik'h at] 'eye', (t→d) [zik'h adŋ] 'my eye', and (t→l) [zik'h alit] 'our (du) eyes'.

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The word final unreleased [t] was assigned to the phoneme t; the voiced [d] occurring before the voiced syllabic nasal [ŋ] to the d phoneme, and the [l] occurring intervocalically to the l phoneme. This resulted in three phonemic shapes for the word 'eye', viz., zikat, zikad and zikal.

Within tagmemic phonology an adequate description is that for which one posits the putative phonemes and then lists the various combinations of these phonemes and whatever alternations occur. Although it is permissible to combine alternants into groups and write a rule (e.g., "With suffixes or clitics which begin with a voiced stop, voiceless root-final stops are replaced with their voiced counterparts" (F&P:150)), this rule is only a convenient shorthand description, for it is the actually occurring individual alternations which are important. This focus upon individual segments often results in morphophonemic alternations being presented as a collection of diverse alternations bearing very little systematic relationship. In the presentation which follows I shall draw together various morphophonemic alternations as presented by F&P, point out their similarities and regularities, cite any irregularities, and present an alternative systematic phonemic analysis associated with quite regular phonological rules.

1. Phonological regularity

The first alternations discussed by F&P are those associated with nominal possessive suffixes as listed in Table 2. These forms occur word finally.

<table>
<thead>
<tr>
<th></th>
<th>Singular</th>
<th>Dual</th>
<th>Plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st person</td>
<td>-n, -m, -ŋ</td>
<td>-nit, -it</td>
<td>-n, -m, -ŋ</td>
</tr>
<tr>
<td>2nd person</td>
<td>-ndi, -di</td>
<td>-ŋit, -it</td>
<td>-ŋin, -in</td>
</tr>
<tr>
<td>3rd person</td>
<td>-ŋaŋ, -naŋ, -maŋ</td>
<td>-ŋit, -it</td>
<td>-ŋin, -in</td>
</tr>
</tbody>
</table>

The first allomorph in each set in Table 2 follows roots ending in vowels, and subsequent allomorphs follow consonants. The allomorphs -m, -n, and -ŋ, and -maŋ, -naŋ, -ŋaŋ occur respectively
following roots ending in bilabial, alveolar or velar consonants. When -m, -n, and -ŋ occur following obstruents, they are syllabic.

The most obvious phonological process evidenced in the possessive suffixes is that syllabic nasals and the initial nasal of the third person singular suffix assimilate to the point of articulation of the preceding consonant. This is accounted for by (1). 4

(1) nasal assimilation (NA)

\[ [+\text{nas}] \rightarrow [\text{ant}] \]
\[ \beta_{\text{cor}} \]
\[ \text{voc} \]
\[ \beta_{\text{cor}} \]

This rule accounts for the nasal assimilation of the date of (2).

(2) [bibm] 'my father', [k'widŋ] 'my name' and [sogpŋ] 'my grandmother', [bibmanŋ] 'his father', [k'widanaŋ] 'his name' and [sogpnaŋ] 'his grandmother'

Less obvious, but crucial for recognizing the underlying phonological structure of the morphemes, is that the vowel \( i \) is subject to deletion in certain environments. In the data of (3) vowel deletion is followed by the syllabification of the preceding nasal.

(3) [misik]~[msik] 'You wash it!' (mi 'hold it', sik 'wash it')
[\( i_k \) aput] 'You sweep it!' (mi 'hold it', \( k^{h} \)ap\( h \)ut 'sweep it')
[msat]~[\( m \)sat] 'ground'
[nisap]~[\( n \)sap] 'I will eat it.' (ni 'eat it', sap 'I will')
[ninak]~[\( n \)nak] 'we ourselves (pl)'

Two rules (4 and 5) account for the data involving nasals.

(4) i-deletion (ID)

\[ [+\text{voc}] \rightarrow \emptyset \]
\[ [+\text{hi}] \rightarrow [+] \]
\[ [+\text{ant}] \rightarrow ( [+\text{nas}] ) \$

(5) nasal syllabification (NS)

\[ [+\text{nas}] \rightarrow [+] \]
\[ [+\text{ant}] \rightarrow [+\text{syl}] \]
\[ ([-\text{son}] ) \$

The ID and NS rules may be extended to include the data of Table 2 if we posit an underlying \( i \) in the first person singular and plural forms, which is then subject to ID. In order to confirm that it is
an underlying i which is deleted in these forms, we can compare the
possessive suffixes with the personal pronoun forms in Table 3.

<table>
<thead>
<tr>
<th></th>
<th>Singular</th>
<th>Dual</th>
<th>Plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st person</td>
<td>ne</td>
<td>nit</td>
<td>nin</td>
</tr>
<tr>
<td>2nd person</td>
<td>ge</td>
<td>qit</td>
<td>qin</td>
</tr>
<tr>
<td>3rd person</td>
<td>ek</td>
<td>egät</td>
<td>eggen</td>
</tr>
</tbody>
</table>

The similarity of the possessive suffixes to the personal
pronouns is a common feature of the Huon Peninsula languages (see
McElhanon 1973:22). In Selepet, for example, the possessive suffixes
appear to have been derived historically from adjectives which
became phonologically bound to the preceding noun (Table 4). The
final syllable, -ŋe, of the dual and plural possessive suffixes is
identical to an adjective derivational suffix as in boliŋe 'bad'
(from boli 'the quality of badness'). Note that for the third
singular suffix only -ŋe occurs.

<table>
<thead>
<tr>
<th></th>
<th>Sg</th>
<th>Du</th>
<th>Pl.</th>
<th>Sg</th>
<th>Du</th>
<th>Pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st per.</td>
<td>no</td>
<td>net</td>
<td>nen</td>
<td>-ne</td>
<td>-netŋe</td>
<td>-nenŋe</td>
</tr>
<tr>
<td>2nd per.</td>
<td>go</td>
<td>yet</td>
<td>yen</td>
<td>-ge</td>
<td>-yetŋe</td>
<td>-yenŋe</td>
</tr>
<tr>
<td>3rd per.</td>
<td>yok</td>
<td>yok</td>
<td>yet</td>
<td>yok</td>
<td>yen</td>
<td>-ŋe</td>
</tr>
</tbody>
</table>

The Nabak third person singular possessive suffix is -ŋaŋ, which is identical to the Nabak adjectivizer. No other possessive
suffixes, however, are so marked. My hypothesis is that Nabak
personal pronouns and possessive suffixes are similarly related and
that with the exception of -ŋaŋ, all Nabak possessive suffixes have
an underlying i (Table 5).

<table>
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<th>Singular</th>
<th>Dual</th>
<th>Plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st person</td>
<td>-ni</td>
<td>-nil</td>
<td>-nin</td>
</tr>
<tr>
<td>2nd person</td>
<td>-di</td>
<td>-gil</td>
<td>-gin</td>
</tr>
<tr>
<td>3rd person</td>
<td>-ŋaŋ</td>
<td>-gil</td>
<td>-gin</td>
</tr>
</tbody>
</table>
In addition to ID and NS, the first person plural form is also subject to a process of geminate consonant cluster reduction, a rule applicable to obstruents as well as nasals and also attested for by other data, e.g., /sakokolo'yat/ ('chicken-for') $\rightarrow$ sakokolog+gat $\rightarrow$ [sak$^h$ok$^h$ologat] 'for a chicken', /kɔl+di/ ('come-ing') $\rightarrow$ kod+di $\rightarrow$ [k$^h$odi] 'coming' and /don+naŋ/ ('cousin-his') $\rightarrow$ don+naŋ [don$^h$əŋ] 'his cousin'. Derivations are provided in (10).

(6) geminate cluster reduction (GR)

$$[-\text{voc}]_1 \rightarrow \emptyset / S[-\text{voc}]_1$$

where $I$ = identity, $S$ = segment

The derivations of the dual forms [zik$^h$alit] from /zikal+$\eta$il/ 'our (du) eyes' and [zik$^h$alin] from /zikal+$\eta$in/ 'our (pl) eyes' incorporate additional rules, viz., (7) despirantization, (8) devoicing and (9) nasal deletion, rules which are also attested for by other data; e.g., despirantization as in /mulaw+yal+$\eta$an/ [mulubgadnaŋ] ('garden-for'-nominalizer) 'garden produce', devoicing as in /muluw/ [mulup] 'garden; and nasal deletion as in /tal+ni$\gamma$/ ('stay-you-are') $\rightarrow$ tad+nik $\rightarrow$ [t$^h$adik] 'you are staying'.

For the possessive suffixes nasal deletion appears to apply only to the velar nasal of the 2nd-3rd personal dual and plural forms when it is preceded by a [+ant] obstruent. Thus we find surface forms such as [sog$\eta$it] 'your/their (du) grandmother'.

(7) despirantization (DS)

$$[+\text{son}]_{-\text{nas}} \rightarrow [-\text{son}] / [-\text{voc}]$$

(8) final devoicing (DV)

$$[+\text{vd}]_{-\text{nas}} \rightarrow [-\text{vd}] / [-\text{vd}]$$

(9) nasal deletion (ND)

$$[+\text{nas}]_{-\text{ant}} \rightarrow \emptyset / [+\text{vd}]$$

$$\rightarrow [-\text{son}] + [+\text{voc}]$$
<table>
<thead>
<tr>
<th></th>
<th>'eye-your(du)'</th>
<th>'eye-my'</th>
<th>'eye-our(pl)'</th>
<th>'eye-our(du)'</th>
</tr>
</thead>
<tbody>
<tr>
<td>UR</td>
<td>zikal+ŋil</td>
<td>zikal+ni</td>
<td>zikal+nin</td>
<td>zikal+nil</td>
</tr>
<tr>
<td>ND</td>
<td>zikal+il</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>DS</td>
<td>zikal+id</td>
<td>zikad+ni</td>
<td>zikad+nin</td>
<td>zikad+nid</td>
</tr>
<tr>
<td>DV</td>
<td>zikal+it</td>
<td>---</td>
<td>---</td>
<td>zikad+nil</td>
</tr>
<tr>
<td>ID</td>
<td>---</td>
<td>zikad+n</td>
<td>zikad+nn</td>
<td>---</td>
</tr>
<tr>
<td>GR</td>
<td>---</td>
<td>---</td>
<td>zikad+n</td>
<td>---</td>
</tr>
<tr>
<td>NS</td>
<td>---</td>
<td>zikad+ŋ</td>
<td>zikad+ŋ</td>
<td>---</td>
</tr>
<tr>
<td>SR</td>
<td>[zik'halit]</td>
<td>[zikadŋ]</td>
<td>[zikadŋ]</td>
<td>[zik'hadnit]</td>
</tr>
</tbody>
</table>

Note that I have chosen the spirant series as underlying the obstruents occurring at morpheme boundaries because the spirants surface when these morphemes occur bounded by vowels in which position they contrast with the voiced and voiceless stops. The result of this choice is morphological simplicity in the underlying forms. Rules (7) and (8) also account for a number of alternations listed by F&P and reveal the basic similarity between rules which they list as disparate.

(11) voiceless stops replaced by voiced stops: "With suffixes or clitics which begin with a voiced stop, voiceless root-final stops are replaced by their voiced counterparts" (F&P:150).5 That is, p, t and k are replaced respectively by b, d and g.

(12) voiceless stops are replaced by w, l or g: "When followed by a vowel, stem final [voiceless--KAM] stops undergo even more radical changes. /p/ is replaced with /w/, /t/ is replaced with /l/, and /k/ is replaced with /g/" (F&P:149).6

(13) suffix initial g is replaced by y. "The purpose clitic is -yet (following a vowel) and -gat (following consonants), and the directional clitic meaning 'from' is yednaŋ (following vowels) and gadnaŋ (following consonants)" (F&P:150). In my analysis, y is underlying and [y] is derived from it by palatalization as discussed below.

(14) suffix initial b is replaced by w. "...the /b/ is replaced with a /w/ if the previous morpheme ends with a vowel not preceded by a nasal consonant" (F&P:150).
One of the insights of generative phonology with its reliance upon distinctive feature analysis is that it reveals natural phoneme classes and the basis for alternations. In what follows, I will suggest that rule (12), which replaces $p$ and $t$ with their spirant counterparts $w$ and $l$, but replaces $k$ with a voiced stop $g$, does not reflect an alternation involving natural classes, and that there is a need to reassess the phonemic status of the phone $[\gamma]$, which F&P have assigned to phoneme /g/ as varying intervocally with $[g]$.

Firstly, note that the output of DS is a series of voiced stops, $b$, $d$ and $g$, and that DV converts these to $p$, $t$ and $k$. Secondly, F&P:156 state that certain verb suffixes with an initial $b$ have this replaced with a $w$. They also state that the purpose clitic $-gat$ which follows consonants has a variant $-yet$ following vowels. Purpose is only one of the roles of this clitic. Others are reference and possession, and one of the allomorphs is $[\gamma\text{t}]$ as in $[\nu\gamma\text{t}]$ 'mine, for me' and $[g\nu\gamma\text{t}]$ 'yours, for you'. The underlying form of this clitic may be posited as $/\gamma\text{a}l/$, which, when following $[o]$, manifests an initial $[\gamma]$. When it is followed by other vowels, however, the $a$ is raised to $[e]$ and the $\gamma$ is palatalized to $[\gamma]$ (rule 15), and this palatalization leads to an optional deletion when $/\gamma\text{a}l/$ follows front vowels, particularly $l$ (rule 16). Derivations are given in (17).

(15) palatalization (PL)

\[
\begin{align*}
\text{[voc]} & \quad \text{[son]} \quad \text{[neg]} \quad \text{[ant]} \\
\text{+} & \quad \text{-} \quad \text{+} \quad \text{-} \\
\hline
\rightarrow & \quad \text{[-bk]} \quad \text{[+voc]} \quad \text{[+low]} \quad \text{[+rd]} \\
\end{align*}
\]

(16) palatal deletion (PD)

\[
\begin{align*}
\text{[voc]} & \quad \text{[cont]} \quad \text{[ant]} \quad \text{[cor]} \quad \text{[bk]} \\
\text{+} & \quad \text{-} \quad \text{-} \quad \text{-} \quad \text{-} \\
\hline
\rightarrow & \quad \emptyset \quad \text{[+voc]} \quad \text{[+low]} \quad \text{[+rd]} \\
\end{align*}
\]

! = the greater the height, the greater the tendency to deletion
(17) 'that-for' 'this-for'
    UR kε+yal pi+yal
    PL (and vowel raising) ke+yel pi+yel
    PD ke+el ~ ke+yel pi+el
    DS ke+ed ~ ke+yed pi+ed
    DV ke+et ~ ke+yet pi+et
    SR [kʰeɾt] ~ [kʰeɾt] [pʰiɾt]
    'for that' 'for this'

In summary, we have seen how DS despirantizes the spirants to become voiced stops preceding voiced consonants, and how DV renders them voiceless word finally. Furthermore, we have seen how DS also despirantizes the spirants to become the stops, b and g following consonants. At the present time, however, I do not have evidence that the intervocalic spirant l is despirantized to d following consonants. Since DS is a rule common to many other Huon Peninsula languages, I prefer to keep it as general as possible, with the provision of excluding the seemingly aberrant l by some other means.

The alternations w, l, y → p, t, k word finally and w, y → b, g following consonants suggest that intervocalic [y] belongs to the class of spirants rather than being a submember of /g/.

Further evidence is found in the alternations resulting from reduplication. When a final [k] becomes intervocalic through reduplication, it is changed to a [y]. If the intervocalic environment meets the conditions for PL or PD, then these rules apply: thus /eɪ+yɛ+pɪŋ/ ('see it'-REDUP-'not') → ey+ek+pɪŋ → [eɛkʰɪŋ] 'Don't look!' and /ɪsɛy+ɪsɛy/ ('little'-REDUP) → [ɪsɛaisak] 'minute'.

F&P have not interpreted Nabak phonology as having voiced prenasalized stops. Therefore, any occurrence of a homorganic nasal plus stop in a monomorphemic word is regarded phonemically as a sequence of a nasal plus a stop. Thus [tʰɛmbe] 'big' is composed of the tagmemic phonemes /tembe/. On the other hand, whenever a vowel and a voiced stop are juxtaposed at a morpheme boundary, the resulting homorganic nasal inserted between the vowel and consonant is regarded
as a morphophonemic change. Thus /bo+di/ (‘pig-your’) results in /bondi/, and F&P list /-di/ as having an allomorph /-ndi/ which follows vowels.

Such an analysis is based upon contrasts in which phonetic voiced stops are compared with other segments. For example, contrasts such as [matʰi] 'going', [mədik] 'you are going', [məlit] 'Let them (du) go!' and [məndi] 'He(du) must hold it!' allow one to posit tagmemic phonemic contrasts for /t/, /d/, and /l/, as well as for the consonant sequence /nd/. Furthermore, these contrasts are paralleled by contrasts at the labial and velar points of articulation.

In a generative phonological analysis the homorganic nasal occurring before the voiced stops and affricate is fully predictable, and hence, non-distinctive. Prenasalization may be introduced by a very early rule (18) which operates before any of the consonant deletion rules, which are then in a counter-feeding relationship to it. If GR preceded PN, then GR would create an environment to which PN would apply, thereby yielding impermissible forms, e.g., /toli+di/ (‘descend-we will’) → tod+di → to+di → to+ndi → *[tʰondi] rather than the correct [tʰodi] ‘we will descend’.

(18) prenasalization (PN)

\[
\begin{array}{c}
0 \\
\text{nas} \\
\text{ant} \\
\beta\text{cor} \\
\text{voc}(+) \\
\end{array} \rightarrow \\
\begin{array}{c}
\text{vd} \\
\text{son} \\
\text{ant} \\
\beta\text{cor} \\
\end{array}
\]

By ordering PN before the consonant deletion rules, it handles not only the prenasalization internal to a morpheme, but also the morphophonemic changes noted by F&P:155: "When a morpheme ends with a nasal-consonant-plus-a-vowel syllable and the next morpheme begins with a voiced stop or /z/, another nasal consonant homorganic to the following voiced stop or /z/ is added to the end of the C_NV syllable". Thus, whereas a tagmemic approach does not recognize the unity between the occurrences of the homorganic nasal plus obstruent sequences morpheme internally and the morphophonemic addition of a homorganic nasal between vowels and obstruents, generative phonology makes such unity explicit by covering both by a single rule.
The phonetically non-prenasalized voiced obstruents can be shown to consist phonemically of a syllable-final spirant followed by a syllable initial consonant. Derivations for these as well as for the prenasalized segments are given in (19).

(19) 'loin cloth-with' 'spit upon-you-he did' 'wash-you-he did'

<table>
<thead>
<tr>
<th></th>
<th>UR</th>
<th>DS</th>
<th>DV</th>
<th>PN</th>
<th>GR</th>
<th>ND</th>
<th>SR</th>
</tr>
</thead>
<tbody>
<tr>
<td>nawi-may</td>
<td>wasey+ge+w</td>
<td>nabi-mag</td>
<td>waseg+ge+b</td>
<td>nabi-mak</td>
<td>waseg+ge+p</td>
<td>---</td>
<td>[nabak]</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>[wasegɛp]</td>
</tr>
<tr>
<td>zuru+ge+w</td>
<td>zuru+ge+b</td>
<td>zuru+ge+p</td>
<td>zuru+nge+p</td>
<td>---</td>
<td>---</td>
<td>[zurungep]</td>
<td></td>
</tr>
</tbody>
</table>

'with a loincloth' 'he spat upon you' 'he washed you' 'open'-REDUP-'not' 'fight-we must' 'descend-we must'

<table>
<thead>
<tr>
<th></th>
<th>UR</th>
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<th>PN</th>
<th>GR</th>
<th>ND</th>
<th>SR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ade+de+pin</td>
<td>au+di</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>[andɛnde+pinhɛ]</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>[aundi]</td>
</tr>
<tr>
<td>tol+di</td>
<td>tod+di</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>[tʰodi]</td>
<td></td>
</tr>
</tbody>
</table>

F&P:154-5 also present a t-deletion rule to account for such data as the following: [tʰawaladik] derived from tat-walat-dik 'you are in the process of digging it' and [tʰakʰingalup] derived from tat-kingat-lup 'we(du) are in the process of being afraid'. Since in my analysis the spirant l underlies a syllable final [t], I shall refer to this as 1-deletion.8

(20) 1-deletion (LD)

\[
\begin{array}{c}
\begin{array}{c}
\text{[son]} \\
\text{[nas]} \\
\text{[cor]}
\end{array}
\end{array} \rightarrow \emptyset \\
\begin{array}{c}
\begin{array}{c}
\text{[voc]} \\
\text{[nas]}
\end{array}
\end{array}
\]

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In concluding their presentation, F&P:157-8 presented what they regarded as "one of the most engaging and exciting grammatical processes in Nabak", viz., reduplication to transform the imperative into a prohibition. They presented a list of processes in five ordered steps, of which nos. 21-23 are morphophonemic. The first process reduplicates the last syllable of verb roots. The next four are as follows:

(21) "Eliminate the final consonant, if there is one, of the (initial) verb root:"
(a) ek+ek+piŋ ('see it'-REDUP-neg.) eekpiŋ  'Don't look!'
(22) "Apply morphophonemic rules to the final consonant of the reduplicated syllable. Before the /p/ of the suffix, /p/ and /t/ are eliminated, but /k/ is not."
(b) kwat+kwat+piŋ ('go up'-REDUP-neg.) kwakwapiŋ  'Don't go up!'
(c) tip+tip+piŋ ('excrete'-REDUP-neg.) titipiŋ  'Don't excrete!'
(d) sek+sek+piŋ ('carry'-REDUP-neg.) sesekpiŋ  'Don't carry it!'
(23) "Add a homorganic nasal consonant before an initial voiced stop or voiced sibilant of the reduplicated syllable."
(e) be+be+piŋ ('put'-REDUP-neg.) bembepiŋ  'Don't put it!'
(f) ande+de+piŋ ('open'-REDUP-neg.) andendepiŋ  'Don't open it!'
(g) mungun+gun+piŋ ('wind around'-REDUP-neg.) mungungunpiŋ  'Don't wind it around!'
(h) za+za+piŋ ('tie'-REDUP-neg.) zanzapiŋ  'Don't tie it!'
"An exception to Step 4 (rule 23) is the following verb:"
(i) kingat+gat+piŋ ('fear'-REDUP-neg.) kingagapiŋ  'Don't be afraid!'
(24) "If a sequence of /m/+vowel+/m/+vowel...results from the reduplication, replace the second /m/ with a /b/;:" 
(j) met+met+piŋ ('go'-REDUP-neg.) → met+met+piŋ → mebepiŋ  'Don't go!'
(k) mot+mot+piŋ ('chase'-REDUP-neg.) → mot+mot+piŋ → mobopiŋ  'Don't chase it!'

Most of these derivations can be accounted for by the rules already presented. Three, however, required additional rules.
Example (j) requires rule (25) obstruent assimilation which assimilates syllable final obstruents to the point of articulation of the following nasal in verb morphology.  

(25) obstruent assimilation (OA)

\[
\begin{align*}
\text{[-son]} & \rightarrow \text{[\alpha\text{ant}]}, \\
\text{[-strid]} & \rightarrow \text{[\beta\text{cor}]} \\
\end{align*}
\]

Example (b) requires rule (26) devocalization which derives a surface [\text{w}] from underlying round vowels.

(26) devocalization (DVoc)

\[
\begin{align*}
\text{[ +rd]} & \rightarrow \text{[-voc]} \bigg/ \{ \text{[-son]} \bigg/ \text{-ant} \bigg/ \# \bigg/ \text{[-rd]} \bigg/ \text{[+voc]} \}
\end{align*}
\]

Example (d) requires that the underlying /\gamma/ in se\gamma be deleted. The motivation for this deletion is not presently clear. It appears that apart from reduplication, \gamma does not delete before s, e.g., se\gamma+se\gamma \rightarrow [\text{asekse} \gamma] 'he will carry him'. F&P:157 attribute this loss to rule (20) but they also cite mungu\text{ŋ} 'to wind around' (example g), which if subject to (20) would yield *[mungugu\text{ng}\text{pi}\text{ŋ}].

With the addition of OA and DVoc, which again are attested for by other data, the phonological component quite adequately handles the intricacies of reduplication. The derivations provided in (27) are letter coded to correlate with the data provided by F&P in (21-24).

(27) (a) 'Don't look!' (b) 'Don't go up!' (c) 'Don't excrete!' (d) 'Don't put it!' (e) 'Don't open it!' (f) 'Don't wind it!'

\[
\begin{align*}
\text{UR} & \quad \text{ey+ey+p\text{ŋ}} & \text{UR} & \quad \text{kua}l+kua+p\text{ŋ} & \text{UR} & \quad \text{t\text{il}+t\text{il}+p\text{ŋ}} \\
\text{DS} & \quad \text{ey}+\text{eg+p\text{ŋ}} & \text{LD} & \quad \text{kua}+\text{kua+p\text{ŋ}} & \text{LD} & \quad \text{ti}+\text{ti}+p\text{ŋ} \\
\text{DV} & \quad \text{ey}+\text{ek+p\text{ŋ}} & \text{DV} & \quad \text{k\text{wa}+k\text{wa}+p\text{ŋ}} & \text{SR} & \quad [\text{t}^\text{h}\text{i}+\text{h}\text{i+p\text{ŋ}}] \\
\text{PL} & \quad \text{ey}+\text{ek+p\text{ŋ}} & \text{SR} & \quad [\text{k}^\text{\text{w}}\text{a}^\text{\text{k}}+\text{\text{w}}\text{a}^\text{\text{p}}\text{\text{h}}\text{\text{i}n}] \\
\text{PD} & \quad \text{e}+\text{ek+p\text{ŋ}} & \text{SR} & \quad [\text{eekp\text{h}}\text{\text{i}n}] \\
\text{SR} & \quad [\text{eekp\text{h}}\text{\text{i}n}] \\
\end{align*}
\]
(h) 'Don't tie it!'  (i) 'Don't be afraid!'
UR za+za+piŋ
PN za+nza+piŋ
SR [zanzipʰiŋ]
UR kigal+gal+piŋ
PN kingal+gal+piŋ
LD kinga+ga+piŋ
SR [kʰingagapʰiŋ]

(j) 'Don't go!'
(k) 'Don't chase it!'
UR mel+mel+piŋ
OA mew+mel+piŋ
LD mew+me+piŋ
DS meb+me+piŋ
ND meb+e+piŋ
SR [mebeʔpʰiŋ]
UR mol+mol+piŋ
OA mow+mol+piŋ
LD mow+mo+piŋ
DS mob+mo+piŋ
ND mob+o+piŋ
SR [mobopʰiŋ]

3. Conclusion

My goal has been to reveal regularity in the morphophonemic alternations catalogued by F&P. Because these alternations often reflect major phonological rules, I have introduced additional data as I have felt them to be illuminating. I have not, however, attempted to provide rules which may be extended to embrace all the data relevant to the phonological structure of Nabak, nor have I determined the precise order of the rules. To do so would lead us far beyond my immediate goal.
NOTES

1. My research in the Nabak language has been carried out under the auspices of the Summer Institute of Linguistics with field trips while I was a research scholar with the Department of Linguistics, R.S.Pac.S., Australian National University, Canberra, from 1967-70, and again as a research fellow from 1975-77.

2. Tagmemic procedures for phonological analysis are presented by K.L. Pike (1947). Pike was clearly a leader in phonological theory, and I suggest that a clear distinction be made between the theory of tagmemic phonology and the procedures, since weaknesses associated with the procedures do not necessarily reflect upon the adequacy of the theory.

3. In the course of this paper I will posit that w, l, and γ represent a class of spirants parallel to the stop series.

4. Nabak distinctive features are as follows:

|        | p | t | k | b | d | g | m | n | η | w | l | γ | s | z | i | e | a | o | u |
| Vocalic|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Voiced|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Nasal  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Sonorant|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Strident|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Anterior|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Coronal |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| High   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Low    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Round  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

The feature [round], which is normally restricted in its application to vowels, is regarded as a cover feature which includes [labial], normally restricted to consonants.

5. This replacement rule is also described by a broader process rule (F&P:149): 'Roots ending with a voiceless stop have that stop voiced when followed by a voiced stop or a nasal'.

6. F&P stated rules which apply to both /p/ and /t/. In reality, however, these rules apply only to /t/, because the morpheme for 'to excrete' was erroneously posited as tip, rather than tit; tip is the noun 'excreta'.

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7. The vowel /a/ harmonizes with the preceding [♂].

8. F&P:153 note that I is deleted following ŋ, but the relationship between this phenomenon and I-deletion is not clear.


10. Note that NA and OA are both minor rules, the former applying to nominals and the latter to verbals.

REFERENCES

