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 1:   Nabak Consonantal Phonemes

Phonemes:																
	p	t	k	b	d	g	kw	gw	w	y	l	s	z	m	n	ŋ

Allophones:

Syllable initially	p^h	t^h	k^h	b	d	g	k^w	g^w	w	y	l	ts	dz	m	n	ŋ
Syllable finally before voiceless stops or pause	p	t	k													
Intervocalically	p^h	t^h	k^h	b	d	g	k^w	g^w	w	y	l	s	dz	m	n	ŋ
Syllable initially or finally adjacent to nasals				b	d	g		g^w				z				

Allophonic variation: The labialized velar stops k^w and g^w 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 ł, and v with w; γ fluctuates with g intervocalically between identical vowels. The vowel phonemes are i [i, ɪ], e [e, ɛ, æ], a [a, ʌ], 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}adn̩] 'my eye', and (t→l) [zik^{h}alit] 'our (du) eyes'.

The word final unreleased [t] was assigned to the phoneme t; the voiced [d] occurring before the voiced syllabic nasal [n̩] 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 2: Nominal possessive suffixes (F&P:148)

	Singular	Dual	Plural
1st person	-n, -m, -ŋ	-nit, -it	-n, -m, -ŋ
2nd person	-ndi, -di	-ŋit, -it	-ŋin, -in
3rd person	-ŋaŋ, -naŋ, -maŋ	-ŋit, -it	-ŋin, -in

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)

$$[+nas] \rightarrow \begin{bmatrix} \alpha ant \\ \beta cor \end{bmatrix} \Big/ \begin{bmatrix} -voc \\ \alpha ant \\ \beta cor \end{bmatrix} \underline{\qquad}$$

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

(2) [bibm̥] 'my father', [kʷidn̥] 'my name' and [sogŋ̥] 'my grandmother',
     [bibmaŋ] 'his father', [kʷidnaŋ] 'his name' and [sogŋaŋ] '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]~[m̥sik] 'You wash it!' (mi 'hold it', sik 'wash it')
     [m̥kʰaput] 'You sweep it!' (mi 'hold it', kʰapʰut 'sweep it')
     [misat]~ [m̥sat] 'ground'
     [nisap]~[n̥sap] 'I will eat it.' (ni 'eat it', sap 'I will')
     [ninak]~ [n̥nak] 'we ourselves (pl)'
     Two rules (4 and 5) account for the data involving nasals.

(4) i-deletion (ID)

$$\begin{bmatrix} +voc \\ +hi \end{bmatrix} \rightarrow \emptyset \Big/ \begin{bmatrix} +nas \\ +ant \end{bmatrix} \underline{\qquad} ([+nas])\$$$

(5) nasal syllabification (NS)

$$\begin{bmatrix} +nas \\ +ant \end{bmatrix} \longrightarrow [+syl] \Big/ \begin{Bmatrix} \# \\ [-son]\$ \end{Bmatrix} \underline{\qquad} \$$$

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 3: Nabak personal pronouns

	Singular	Dual	Plural
1st person	ne	nit	nin
2nd person	ge	ŋit	ŋin
3rd person	ek	egŋet	egŋen

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 bɔleŋe 'bad'
(from bɔle 'the quality of badness'). Note that for the third
singular suffix only -ŋe occurs.

Table 4: Selepet pronouns and nominal possessive suffixes

	pronouns			possessive suffixes		
	Sg	Du	Pl.	Sg	Du	Pl
1st per.	nɔ	net	nen	-ne	-netŋe	-nenŋe
2nd per.	gɔ	yet	yen	-ge	-yetŋe	-yeŋe
3rd per.	yɔk	yɔk yet	yɔk yen	-ŋe	-yetŋe	-yeŋe

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 5: Nabak nominal possessive suffixes in underlying forms

	Singular	Dual	Plural
1st person	-ni	-nil	-nin
2nd person	-di	-ŋil	-ŋin
3rd person	-ŋaŋ	-ŋil	-ŋin

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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., /sakokoloɣ+ɣat/ ('chicken-for') ⟶ sakokolog+gat
⟶ [sakʰokʰologat] 'for a chicken', /kol+di/ ('come-ing') → kod+di
⟶ [kʰodi] 'coming' and /don+ŋaŋ/ ('cousin-his') ⟶ don+naŋ
[donaŋ] 'his cousin'. Derivations are provided in (10).

(6) geminate cluster reduction (GR)

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

where 1 = identity, S = segment

The derivations of the dual forms [zikʰalit] from /zikal+ŋil/
'our (du) eyes' and [zikʰalin] from /zikal+ŋin/ '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+ɣal+ŋan/ [mulubgadnaŋ]
('garden-for'-nominalizer) 'garden produce', devoicing as in /muluw/
[mulup] 'garden; and nasal deletion as in /tal+niɣ/ ('stay-you-are')
⟶ tad+nik ⟶[tʰadik] '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 [sogŋit] 'your/their (du) grandmother'.

(7) despirantization (DS)

$$\begin{bmatrix} +\text{son} \\ -\text{nas} \end{bmatrix} \longrightarrow [-\text{son}] \Big/ [-\text{voc}]$$

(8) final devoicing (DV)

$$\begin{bmatrix} +\text{vd} \\ -\text{nas} \end{bmatrix} \longrightarrow [-\text{vd}] \Big/ \underline{\quad} \left\{ \begin{matrix} \# \\ [-\text{vd}] \end{matrix} \right\}$$

(9) nasal deletion (ND)

$$\begin{bmatrix} +\text{nas} \\ -\text{ant} \end{bmatrix} \longrightarrow \emptyset \Big/ \begin{bmatrix} +\text{vd} \\ -\text{son} \\ +\text{ant} \end{bmatrix} + \underline{\quad} [+\text{voc}]$$

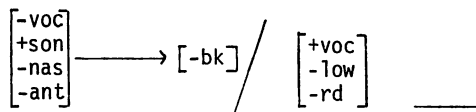| (10)	'eye-your(du)'	'eye-my'	'eye-our(pl)'	'eye-our(du)'
UR	zikal+ŋil	zikal+ni	zikal+nin	zikal+nil
ND	zikal+il	---	---	---
DS	zikal+id	zikad+ni	zikad+nin	zikad+nid
DV	zikal+it	---	---	zikad+nit
ID	---	zikad+n	zikad+nn	---
GR	---		zikad+n	---
NS	---	zikad+n̩	zikad+n̩	---
SR	[zik^{h}alit]	[zikadn̩]	[zikadn̩]	[zik^{h}adn̩it]
	'your(du) eyes'	'my eye'	'our(pl) eyes'	'our(du) eyes'

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, ɣ 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).
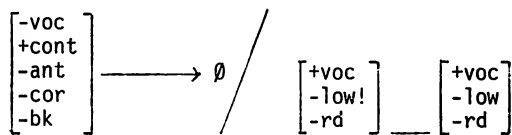
One of the insights of generative phonology with its reliance
upon distinctive feature analysis is that it reveals natural phoneme
classes and the basis for alternations. In what follows, I will
suggest that rule (12), which replaces p and t with their spirant
counterparts w and l, but replaces k with 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 [ɣ], which F&P
have assigned to phoneme /g/ as varying intervocalically 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 [ɣɔt] as in [nɔɣɔt] 'mine,
for me' and [gɔɣɔt] 'yours, for you'. The underlying form of this
clitic may be posited as /ɣal/ which, when following [ɔ], manifests
an initial [ɣ].7 When it is followed by other vowels, however, the
a is raised to [ε] and the ɣ is palatalized to [y] (rule 15), and this
palatalization leads to an optional deletion when /ɣal/ follows front
vowels, particularly l (rule 16). Derivations are given in (17).

(15) palatalization (PL)

$$\begin{bmatrix} -voc \\ +son \\ -nas \\ -ant \end{bmatrix} \longrightarrow [-bk] \left/ \begin{bmatrix} +voc \\ -low \\ -rd \end{bmatrix} \underline{\hspace{1cm}} \right.$$

(16) palatal deletion (PD)

$$\begin{bmatrix} -voc \\ +cont \\ -ant \\ -cor \\ -bk \end{bmatrix} \longrightarrow \emptyset \left/ \begin{bmatrix} +voc \\ -low! \\ -rd \end{bmatrix} \underline{\hspace{1cm}} \begin{bmatrix} +voc \\ -low \\ -rd \end{bmatrix} \right.$$

! = the greater the height, the greater the tendency to deletion

(17)   'that-for'   'this-for'

UR   kɘ+ɣaɪ   pɪ+ɣaɪ

PL (and vowel raising)   kɘ+yeɪ   pɪ+yeɪ

PD   kɘ+eɪ ∼ kɘ+yeɪ   pɪ+eɪ

DS   kɘ+ed ∼ kɘ+yed   pɪ+ed   .

DV   kɘ+et ∼ kɘ+yet   pɪ+et

SR   [kʰeɛt] ∼ [kʰeyɛt]   [pʰɪɛt]

                               '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 ɪ 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 ɪ by some other means.

The alternations w, ɪ, ɣ⟶ p, t, k word finally and w,ɣ ⟶ b, g following consonants suggest that intervocalic [ɣ] 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 [ɣ]. If the intervocalic environment meets the conditions for PL or PD, then these rules apply: thus /eɣ+eɣ+piŋ/ ('see it'-REDUP-'not') ⟶ eɣ+ek+piŋ ⟶[eɛkpʰiŋ] 'Don't look!' and /ɪsaɣ+ɪsaɣ/ ('little'-REDUP)⟶ [ɪsaɪsak] '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

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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 [mət^{h}i] 'going', [mədik] 'you are going', [məlit] 'Let them
(du) go!' and [mɩndi] 'We(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
parallelled by contrasts at the labial and velar points of articula-
tion.

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., /tol+di/
('descend-we will') ⎯⎯⎯→ tod+di ⎯⎯→ to+di ⎯⎯⎯→ to+ndi ⎯→*[t^{h}ondi]
rather than the correct [t^{h}odi] 'we will descend'.
(18) prenasalization (PN)

$$\emptyset \longrightarrow \begin{bmatrix} +nas \\ \alpha ant \\ \beta cor \end{bmatrix} +voc\underline{\quad\quad}(+) \begin{bmatrix} +vd \\ -son \\ \alpha ant \\ \beta cor \end{bmatrix}$$
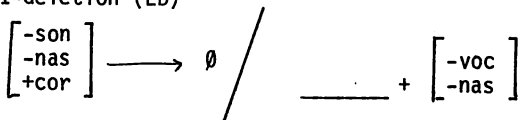
By ordering PN before the consonant deletion rules, it handles
not only the prenasalization internal to a morpheme, but also the
morphophonemic changes noted by F&P:155: "When a morpheme ends with
a nasal-consonant-plus-a-vowel syllable and the next morpheme begins
with a voiced stop or /z/, another nasal consonant homorganic to
the following voiced stop or /z/ is added to the end of the $C_N V$
syllable". Thus, whereas a tamemic approach does not recognize the
unity between the occurrences of the homoganic nasal plus obstruent
sequences morpheme internally and the morphophonemic addition of a
homoganic nasal between vowels and obstruents, generative phonology
makes such unity explicit by covering both by a single rule.

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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'

UR	naw+maɣ	wasey+ge+w	zuru+ge+w
DS	nab+mag	waseg+ge+b	zuru+ge+b
DV	nab+mak	waseg+ge+p	zuru+ge+p
PN	---	---	zuru+ŋge+p
GR	---	wase+ge+p	---
ND	nab+ak	---	---
SR	[nabak]	[wasegɛp]	[zuruŋgɛp]

'with a loincloth'   'he spat upon you'   'he washed you'

'open'-REDUP-'not' 'fight-we must' 'descend-we must'

UR	ade+de+piŋ	au+di	tol+di
DS	---	---	tod+di
DV	---	---	---
PN	ande+nde+piŋ	au+ndi	---
GR	---	---	to+di
ND	---	---	---
SR	[andɛndɛpʰiŋ]	[aundi]	[tʰodi]

'Don't open it!' 'Let us fight!' 'Let us go
                                      down!'

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 [tʰakʰiŋgalup] derived from
tat-kiŋgat-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)

$$\begin{bmatrix} -son \\ -nas \\ +cor \end{bmatrix} \longrightarrow \emptyset \Big/ \underline{\hspace{2cm}} + \begin{bmatrix} -voc \\ -nas \end{bmatrix}$$

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!'[9]
    (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) muŋguŋ+guŋ+piŋ ('wind around'-REDUP-neg.) muŋguŋguŋpiŋ '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) kiŋgat+gat+piŋ ('fear'-REDUP-neg.) kiŋgagapiŋ '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.) ──→ me+me+piŋ ──→ mebepiŋ 'Don't go!'
    (k) mɔt+mɔt+piŋ ('chase'-REDUP-neg.) ──→ mɔ+mɔ+piŋ ──→ mɔbɔpiŋ '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.[10]

(25) obstruent assimilation (OA)

$$\begin{bmatrix} -son \\ -strid \end{bmatrix} \longrightarrow \begin{bmatrix} \alpha ant \\ \beta cor \end{bmatrix} \bigg/ \underline{\hspace{1cm}} \begin{bmatrix} +nas \\ \alpha ant \\ \beta cor \end{bmatrix}$$

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

(26) devocalization (DVoc)

$$[\ +rd] \longrightarrow [-voc] \bigg/ \left\{ \begin{matrix} \begin{bmatrix} -son \\ -ant \end{bmatrix} \\ \# \end{matrix} \right\} \underline{\hspace{1cm}} \begin{bmatrix} +voc \\ -rd \end{bmatrix}$$

Example (d) requires that the underlying /ɣ/ in seɣ be deleted.
The motivation for this deletion is not presently clear. It appears
that apart from reduplication, ɣ does not delete before s, e.g.,
aseɣ+sem ⎯⎯⎯→[asɛksɛm] 'he will carry him'. F&P:157 attribute this
loss to rule (20) but they also cite muŋguŋ 'to wind around' (example
g), which if subject to (20) would yield *[muŋguguŋpiŋ].

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!'

	(a)		(b)		(c)
UR	eɣ+eɣ+piŋ	UR	kual+kual+piŋ	UR	til+til+piŋ
DS	eɣ+eg+piŋ	LD	kua+kua+piŋ	LD	ti+ti+piŋ
DV	eɣ+ek+piŋ	DVoc	kwa+kwa+piŋ	SR	[tʰitʰipʰiŋ]
PL	eɣ+ek+piŋ	SR	[kʷakʷapʰiŋ]		
PD	e+ek+piŋ				
SR	[eɛkpʰiŋ]				

(e) 'Don't put it!' (f) 'Don't open it!' (g) 'Don't wind it!'

	(e)		(f)		(g)
UR	be+be+piŋ	UR	ade+de+piŋ	UR	muguŋ+guŋ+piŋ
PN	be+mbe+piŋ	PN	ande+nde+piŋ	PN	muŋguŋ+guŋ+piŋ
SR	[bɛmbɛpʰiŋ]	SR	[andɛndɛpʰiŋ]	SR	[muŋguŋguŋpʰiŋ]

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        (h) 'Don't tie it!'           (i) 'Don't be afraid!'

UR   za+za+piŋ                UR   kigal+gal+piŋ
PN   za+nza+piŋ               PN   kiŋgal+gal+piŋ
SR   [zanzapʰiŋ]              LD   kiŋga+ga+piŋ
                             SR   [kʰiŋgagapʰiŋ]

        (j) 'Don't go!'              (k) 'Don't chase it!'

UR   mel+mel+piŋ              UR   mɔl+mɔl+piŋ
OA   mew+mel+piŋ              OA   mɔw+mɔl+piŋ
LD   mew+me+piŋ               LD   mɔw+mɔ+piŋ
DS   meb+me+piŋ               DS   mɔb+mɔ+piŋ
ND   meb+e+piŋ                ND   mɔb+ɔ+piŋ
SR   [mɛbɛpʰiŋ]               SR   [mɔbɔpʰiŋ]
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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.

N O T E S

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 y 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	ŋ	w	l	y	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'.

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

8. F&P:153 note that ı is deleted following ŋ, but the relationship between this phenomenon and 1-deletion is not clear.

9. See note 6.

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

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