THE MORPHOPHONEMICS OF NABAK

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Nabak is a non-Melanesian language spoken by approximately 10,000 people in the Western Huon Peninsula, a few miles north of Lae, in the Morobe District.[1]

In this paper, we will be concerned chiefly with the morphophonemic alternations involving consonants.

The basic syllable pattern of Nabak is $(C_1) \; V \; (C_2)$, where the brackets indicate that either or both consonants may be absent. C_1 includes all sixteen consonants, all of which occur in word and syllable initial position. C_2 includes only the voiced and voiceless stops (but not the labialized stops), the nasals, and /s/. However, only the voiceless stops and the nasals may occur in stem and word final position. We will call the latter class of consonants C_{2A}, and it is with the consonants of C_{2A} that we will be chiefly concerned.

Of all the possible combinations of $C_2 C_1$ consonant sequences that might occur across syllable boundaries, only about half actually occur. The following table gives the consonant sequences that have been found so far:

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tp
kp   kt                                              ks   kz
              bd   bg   bm
                   dg        dn
         gb   gd        gm        gŋ        gz
mp   mt  mb   md   mg        mn        ms   mz
     nt       nd   ng   nm   nn        ns   nz

ŋp  ŋt ŋk ŋb ŋd  ŋg ŋgw  ŋm  ŋn          ŋs  ŋz
        sk
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Note that the top half of the chart involving stops as the first consonant is less dense than the bottom half of the chart where nasals are the first member of a consonant sequence. /kw/, /l/, /w/, and /y/ never occur in any consonant sequences. Of the

members of C_2, /p/, /t/, /d/, and /s/ have very restricted distribution as the first members of a sequence. /k/, /gw/, and /ŋ/ have limited distribution as second members of consonant sequences.

Most of the morphophonemic alternations involve the final consonants of roots and affixes when they are followed by other morphemes within the word.

We will begin with the nouns and their suffixes. The table below gives the possessor suffixes that are suffixed to nouns.

	singular	dual	plural
First Person	-n~-m~-ŋ		
		-nit~ -it	
Second Person	-ndi~ -di		
		-ŋit~ -it	-ŋin~ -in
Third Person	-ŋaŋ~ -maŋ ~ -naŋ		

In the previous chart, the first allomorph listed occurs with roots ending in vowels. Of those suffixes having two allomorphs, the second occurs following noun roots ending in a consonant. Of those suffixes with three allomorphs, those allomorphs beginning with bilabial, alveolar, and velar nasals occur with noun roots ending with a bilabial, alveolar, and velar consonant, respectively.

The allomorphs given on the chart are those that occur word-final, i.e. are not followed by further suffixes or clitics. When they are followed by another suffix or clitic, they often have shortened forms. The examples below show the various combinations of noun roots and suffixes.

Examples of roots ending with vowels;

       bo-n   ⟶   bon
       pig-my   'my/our pig'

bo-nit   ⟶   bonit
pig-our2   'our2 pig'

bo-ndi   ⟶   bondi
pig-your   'your pig'

bo-ŋaŋ   ⟶   boŋaŋ
pig-his   'his pig'

bo-ɲit   ⟶   boɲit
pig-your2   'your2/their2pig'

bo-ɲin   ⟶   boɲin
pig-your3   'your3/their3 pig'

Roots ending with a voiceless stop have that stop voiced when followed by a voiced stop or a nasal:

bip-m   ⟶   bibm
father-my   'my father'

kwit-n   ⟶   kwidn
name-my   'my name'

sok-ŋ   ⟶   sogŋ
grandmother-my   'my grandmother'

bip-di   ⟶   bibdi
father-your   'your father'

zikat-di   ⟶   zikadi
eye-your   'your eye'   (reduction of double consonant)

sok-di   ⟶   sogdi
grandmother-your   'your grandmother'

When followed by a vowel, stem final stops undergo even more radical changes.

/p/ is replaced with /w/, /t/ is replaced with /l/, and /k/ is replaced with /g/.

bip-it   ⟶   biwit
father-your2   'your2 father'

zikat-it   ⟶   zikalit
eye-your2   'your2 eye'

sok-it   ⟶   sogit
grandmother-your2   'your2 grandmother'

bap-en	$\longrightarrow$	bawen
floor-on		'on the floor'
set-en	$\longrightarrow$	selen
trail-on		'on the trail'
sisak-en	$\longrightarrow$	sisagen
beam-on		'on the beam (of a house)'
tu-en	$\longrightarrow$	tuyen
water-to		'to the river'

With suffixes or clitics which begin with a voiced stop, voiceless root-final stops are replaced with their voiced counterparts. Two identical stops reduce to one stop. The purpose clitic is -yet (following a vowel) and -gat (following 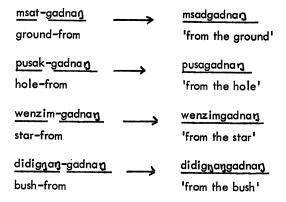consonants), and the directional clitic meaning 'from' is -yednaŋ (following vowels) and -gadnaŋ (following consonants):

tu-yet	$\longrightarrow$	tuyet
water-for		'for water'
mulup-gat	$\longrightarrow$	mulubgat
garden-for		'(a fence) for the garden'
set-gat	$\longrightarrow$	sedgat
foot-for		'(medicine) for the foot'
sakokolok-gat	$\longrightarrow$	sakokologat
chicken-for		'for the chicken'
welili-yednaŋ	$\longrightarrow$	weliliyednaŋ
city-from		'from the city'
tu-yednaŋ	$\longrightarrow$	tuyednaŋ
water-from		'from the river'
ayoŋga-yednaŋ	$\longrightarrow$	ayoŋgayednaŋ
moon-from		'from the moon'
gwidep-gadnaŋ	$\longrightarrow$	gwidebgadnaŋ
bridge-from		'from the bridge'

msat-gadnaŋ	→	msadgadnaŋ
ground-from		'from the ground'
pusak-gadnaŋ	→	pusagadnaŋ
hole-from		'from the hole'
wenzim-gadnaŋ	→	wenzimgadnaŋ
star-from		'from the star'
didignaŋ-gadnaŋ	→	didignaŋgadnaŋ
bush-from		'from the bush'

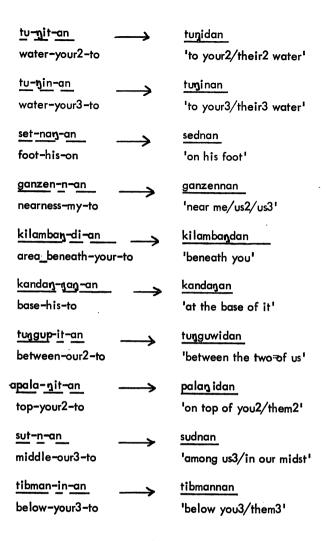The final /t/ of the possessive suffix is replaced with /d/ when it is followed by the locational clitic. The locational clitic, which is -en following a noun root, has the form -an when it follows a possessive suffix:

set-it-an	→	selidan
trail-your2-on		'on your2 trail'
mulup-it-an	→	muluwidan
garden-your2-too		'to your2 garden'

Some of the possessive suffixes have shortened forms when followed by the locational clitic. This is especially true of the third person singular suffix which often reduces to a single nasal consonant. Other suffixes lose their vowel:

mulup-maŋ-an	→	mulubman
garden-his-in		'in his garden'
mka-ŋaŋ-an	→	mkaŋan
house-his-in		'in his house'
tu-ndi-an	→	tundan
water-your-to		'to your water/river'
tu-nit-an	→	tundan
water-our2-to		'to our2 water'
tu-ŋaŋ-an	→	tuŋan
water-his-to		'to his water'
tu-n-an	→	tunan
water-my-to		'to my/our2/our3 water'

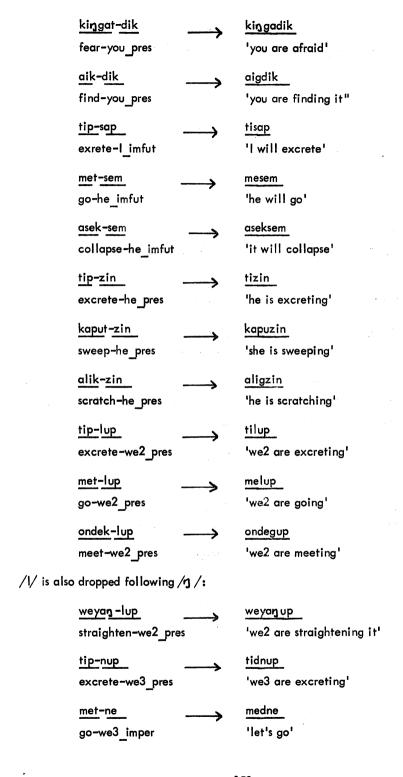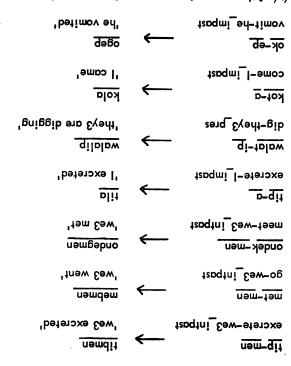|		
tu-ŋit-an	⟶	tuŋidan
water-your2-to		'to your2/their2 water'
tu-ŋin-an	⟶	tuŋinan
water-your3-to		'to your3/their3 water'
set-naŋ-an	⟶	sednan
foot-his-on		'on his foot'
ganzen-n-an	⟶	ganzennan
nearness-my-to		'near me/us2/us3'
kilambaŋ-di-an	⟶	kilambaŋdan
area_beneath-your-to		'beneath you'
kandaŋ-ŋaŋ-an	⟶	kandaŋan
base-his-to		'at the base of it'
tuŋgup-it-an	⟶	tuŋguwidan
between-our2-to		'between the two of us'
apala-ŋit-an	⟶	palaŋidan
top-your2-to		'on top of you2/them2'
sut-n-an	⟶	sudnan
middle-our3-to		'among us3/in our midst'
tibman-in-an	⟶	tibmannan
below-your3-to		'below you3/them3'

When we look at the verbal system, we find that the final voiceless stops of verb roots are changed even more than are the final stops of noun roots.

/p/ and /t/ undergo more changes than does /k/. /p/ and /t/ are dropped when followed by a voiced stop, a sibilant, or /l/; are replaced with /l/ when followed by a vowel; and are replaced with a voiced stop homorganic to a following nasal consonant. In all these environments, except /s/, /k/ is replaced with /g/, and when /l/ follows /g/, the /l/ is dropped.

tip-dik	tidik
excrete-you_pres	'you are excreting'

kiŋgat-dik	⟶	kiŋgadik
fear-you_pres		'you are afraid'
aik-dik	⟶	aigdik
find-you_pres		'you are finding it"
tip-sap	⟶	tisap
exrete-I_imfut		'I will excrete'
met-sem	⟶	mesem
go-he_imfut		'he will go'
asek-sem	⟶	aseksem
collapse-he_imfut		'it will collapse'
tip-zin	⟶	tizin
excrete-he_pres		'he is excreting'
kaput-zin	⟶	kapuzin
sweep-he_pres		'she is sweeping'
alik-zin	⟶	aligzin
scratch-he_pres		'he is scratching'
tip-lup	⟶	tilup
excrete-we2_pres		'we2 are excreting'
met-lup	⟶	melup
go-we2_pres		'we2 are going'
ondek-lup	⟶	ondegup
meet-we2_pres		'we2 are meeting'

/l/ is also dropped following /ŋ/:

weyaŋ-lup	⟶	weyaŋup
straighten-we2_pres		'we2 are straightening it'
tip-nup	⟶	tidnup
excrete-we3_pres		'we3 are excreting'
met-ne	⟶	medne
go-we3_imper		'let's go'

tip-men → tibmen | excrete-we3 intpast | 'we3 excreted'

met-men → mebmen | go-we3 intpast | 'we3 went'

ondek-men → ondegmen | meet-we3 intpast | 'we3 met'

tip-a → tila | excrete-I impast | 'I excreted'

walat-ip → walalip | dig-they3 pres | 'they3 are digging'

kot-a → kola | come-I impast | 'I came'

ok-ep → ogep | vomit-he impast | 'he vomited'

The final /t/ of the progressive aspect prefix tat- is subject to even different rules. It is replaced with a voiced stop homorganic to a following verb-root-initial nasal conso-nant; and is dropped when followed by any other consonant or vowel.
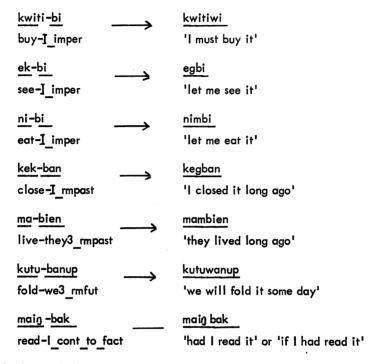
tat-met-ap → tabmelap | prog-go-I pres | 'I am in the process of going'

tat-ni-ap → tadniap | prog-eat-I pres | 'I am in the process of eating'

tat-pu-yap → tapuyap | prog-carry-I pres | 'I am in the process of carrying it'

tat-bese-nik → tabesenik | prog-suck-you pres | 'You are in the process of sucking it'

tat-dundu-in → tadunduin | prog-pray-he pres | 'he is in the process of praying'

tat-kiŋ gat-lup → takiŋ galup | prog-fear-we2 pres | 'we2 are in the process of being afraid'

tat-gaki-lup	→	tagakilup
prog-die-we2_pres		'we2 are in the process of dying'
tat-sili-nup	→	tasilinup
prog-mend-we3_pres		'we3 are in the process of mending it'
tat-zakalu-ip	→	tazakaluip
prog-keep-you3_pres		'you3 are in the process of keeping it'
tat-leli-ap	→	taleliap
prog-stir-I_pres		'I am in the process of stirring it'
tat-walat-dik	→	tawaladik
prog-dig-you_pres		'you are in the process of digging it'
tat-yenge-in	→	tayengein
prog-spread-he_pres		'he is in the process of spreading it out'

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. Take, for example, the continuative aspect prefix ma-:

ma-zi-ma-be	→	manzimambe
cont-burn-cont-he_rmfut		'it will always burn'
ma-bute-ma-bap	→	mambutemambap
cont-awaken-cont-I_rmfut		'I will always awaken him'
ma-dundu-lup	→	mandundulup
cont-pray-we2_pres		'we2 are always praying'
ma-gabe-ma-banik	→	mangabemambanik
cont-carry-cont-you_rmfut		'you will always carry it (on your shoulder)'
ma-gaki-nte-mien	→	mangakintemien
cont-die-cont-they3_intpast		'they always died'

In the following example, the verb root sa 'give' has the allomorph a when it is preceded by a consonant.

ma-g-sa -yap	→	mangayap
cont-to_you-give-I_pres		'I am always giving it to you'

There are several verb suffixes which have alternate shapes. One interesting group is those which begin with /b/, such as the remote-past, the remote future, the contrary-to-fact, and the first person imperative suffixes. In these suffixes, the initial /b/ is preceded by an /m/ if the previous morpheme ends with a $C_N V$ syllable, and the /b/ is replaced with a /w/ if the previous morpheme ends with a vowel not preceded by a nasal consonant.

<u>kwiti-bi</u>　　　——→　　<u>kwitiwi</u>
buy-I_imper　　　　　　　'I must buy it'

<u>ek-bi</u>　　　　　——→　　<u>egbi</u>
see-I_imper　　　　　　　'let me see it'

<u>ni-bi</u>　　　　　——→　　<u>nimbi</u>
eat-I_imper　　　　　　　'let me eat it'

<u>kek-ban</u>　　　　——→　　<u>kegban</u>
close-I_rmpast　　　　　'I closed it long ago'

<u>ma-bien</u>　　　　——→　　<u>mambien</u>
live-they3_rmpast　　　'they lived long ago'

<u>kutu-banup</u>　　　——→　　<u>kutuwanup</u>
fold-we3_rmfut　　　　　'we will fold it some day'

<u>maiŋ -bak</u>　　　　———　　<u>maiŋ bak</u>
read-I_cont_to_fact　　'had I read it' or 'if I had read it'

Several other verbal suffixes have two alternate forms:

-nte ~ -te　　　　　　　past continuative

-ya ~ -a　　　　　　　1 singular immediate past

-nak ~ -dak　　　　　　2 singular immediate past

-p ~ -ep　　　　　　　3 singular immediate past

-yo ~ -o　　　　　　　2 or 3 plural immediate past

-nn ~ -n　　　　　　　1 plural immediate past

-yan ~ -zan　　　　　　3 singular intermediate past

-ya ~ -ga　　　　　　　3 singular remote past

-nik ~ -dik　　　　　　2 singular present

-in ~ -zin　　　　　　　3 singular present

-k ~ -ak　　　　　　　3 singular imperative

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-ndi ~ -di   1 dual imperative

In the above list, the first member of each pair is used with verb roots which end with a vowel, and the second with those which end with a consonant. Note that in the two columns of the list above, there is no uniform long or short variants pattern, no initial vowel versus initial consonant patterns.

And now we come to one of the most engaging and exciting grammatical processes in Nabak. It is reduplication. For example, the negative imperative is formed by reduplicating the last syllable of the verb root and adding the suffix -piŋ. This process can be described in five ordered steps:

Step I   Reduplicate the last syllable of the verb root:

                 kutu-tu-piŋ   ⟶   kututupiŋ
                 fold-redup-negative   'don't fold it!'

Step II   Eliminate the final consonant, if there is one, of the (initial) verb root:

                 ek-ek-piŋ   ⟶   eekpiŋ
                 see-redup-negative   'don't look!'

Step III   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.

                 kwat-kwat-piŋ   ⟶   kwakwapiŋ
                 go_up-redup-negative   'don't come up!'

                 tip-tip-piŋ   ⟶   titipiŋ
                 excrete-redup-negative   'don't excrete!'

                 sek-sek-piŋ   ⟶   sesekpiŋ
                 carry-redup-negative   'don't carry it!'

Step IV   Add a homorganic nasal consonant before an initial voiced stop or voiced
             sibilant of the reduplicated syllable.

                 be-be-piŋ   _____   bembepiŋ
                 put-redup-negative   'don't put it!'

                 ande-de-piŋ   _____   andendepiŋ
                 open-redup-negative   'don't open it!'

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muŋguŋ-guŋ-piŋ ___ muŋguŋguŋpiŋ
wind_around-redup-neg   'don't wind it around!'

za-za-piŋ ⟶ zanzapiŋ
tie-redup-negative   'don't tie it!'

An exception to Step IV is the following verb:

kiŋgat-gat-piŋ ___ kiŋgagapiŋ
fear-redup-negative   'don't be afraid!'

Step V   If a sequence of /m/+vowel+/m/+vowel... results from the reduplication,
replace the second /m/ with a /b/:

met-met-piŋ → me-me-piŋ → mebepiŋ
go-redup-neg   'don't go!'

mât-mât-piŋ → mâ-mâ-piŋ → mâbâpiŋ
chase-redup-neg   'don't chase it!'

NOTES

The tentative phonemes of Nabak with their phonetic values are:

/p/	[p, p^h]	/s/	[s, ts]
/t/	[t, t^h]	/z/	[z, dz]
/k/	[k, k^h]	/m/	[m]
/b/	[b]	/n/	[n]
/d/	[d]	/ŋ/	[ŋ]

/ǝ/	[g,ɚ]	/l/	[l,r]
/kw/	[kʷ, kᵖ]	/w/	[w, v]
/gw/	[gʷ, gᵇ]	/y/	[y]
/i/	[i, ɩ]	/u/	[ʊ]
/e/	[e, ɛ œ]	/o/	[o]
/a/	[a, ʌ]	/â/	[ɔ]

Abbreviations used in this paper are:

X-X	morphemes joined in a word
X_X	words joined together to translate a single morpheme
cont	continuative
cont_to_fact	contrary to fact
imfut	immediate future
impast	immediate past
imper	imperative
intpast	intermediate past
neg	negative
our2	First person dual possessive
our3	First person plural possessive
pres	present tense
prog	progressive aspect
redup	reduplicated syllable
rmfut	remote future
rmpast	remote past
their2	third person dual possessive
their3	third person plural possessive
they2	third person dual
they3	third person plural
you	second person singular
you2	second person dual
you3	second person plural
your	second person singular possessive
your 2	second person dual possessive

your3	second person plural possessive
we2	first person dual
we3	first person plural