UNTANGLING LETI INFIXATION[1]

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Leti(nese) is an Austronesian language spoken on the island of Leti, just east of Timor. Descriptions of Leti include Jonker (1932) and van Engelenhoven (1995a, 1996). In this paper, I focus on Leti infixation, a little-studied aspect of Leti morphology. In Leti, infixation yields nouns from verb roots. There are eight distinct phonological forms of the nominalizing affix: the three infixes *-ni-, -n-, -i-;* the three prefixes *ni-, i-, nia-;* the parafix *i- + -i-;* and a zero allomorph. Leti nominalizing infixation poses two serious problems of analysis. The first challenge is to properly predict the distribution and shape of the eight allomorphs. A second problem is accounting for the fact that some of the sound patterns that result from infixation are exactly the opposite of those predicted by Optimality approaches like those of Prince and Smolensky (1993). In this paper I demonstrate how the eight allomorphs of the nominalizing affix can be derived from two basic allomorphs via phonological rules, with allomorph selection related to verb class. There appears to be no phonological motivation for the treatment of /ni-/ as a prefix that has been shifted to infixal position due to dominant phonological constraints. The positioning of /-ni-/ must be morphologically specified, either in terms of an infixation rule or some constraint-based equivalent.

1. INTRODUCTION. Leti(nese) is an Austronesian language spoken on the Island of Leti, just east of Timor. Descriptions of Leti include Jonker (1932) and van Engelenhoven (1995a, 1996). Leti is well known for its interesting synchronic metatheses and apocopes, which are the subject of van der Hulst and van Engelenhoven (1995) and Hume (1997, 1998). Diachronic studies of sound patterns include van Engelenhoven (1995b) and Blevins and Garrett (1998:541–547).

   In this paper, I provide a phonological and morphological analysis of Leti infixation. All data are taken from van Engelenhoven 1995a, which provides the first comprehensive description of this morphological construction. In Leti, infixation yields nouns from verb roots, as shown in table 1.[2] Leti nominalizing

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infixation (NOM) poses two serious problems of analysis. The first challenge is to properly predict the range of allomorphs for NOM. As shown in table 1, there are eight distinct allomorphs of NOM; (a–c) are infixes, while (d, f) are prefixes. Segmental realization of this morpheme is absent altogether in (e), and (g) appears to involve prefixation and infixation.

TABLE 1. THE EIGHT ALLOMORPHS OF THE LETI NOMINALIZING (NOM) MORPHEME

	NOM	VERB STEM		DERIVED NOMINAL		AFFIX TYPE
a.	-ni-	kaati	'to carve'	k-ni-aati	'carving'	infix
b.	-n-	kini	'to kiss'	k-n-ini	'kissing'	infix
c.	-i-	mai	'to come'	m-i-ai	'arrival'	infix
d.i.	i-	atu	'to know'	i-atu	'knowledge'	prefix
d.ii.	ni-	atu	'to know'	ni-atu	'knowledge'	prefix
e.	Ø	ruru	'to tremble'	ruru	'trembling'	null
f.	nia-	ltieri	'to speak'	nia-ltieri	'speech'	prefix
g.	i-, -i-	natu	'to send'	i-n-i-atu	'sending'	prefix + infix

Second, some of the sound patterns that result from infixation are exactly the opposite of those predicted by Optimality approaches like that of Prince and Smolensky (1993). Under the OT approach, infixation *per se* is nonexistent. Prefixes and suffixes are pushed into the base by highly ranked phonological constraints on prosodic structure. For example, the well known *-um-* infix of Malayo-Polynesian languages like Tagalog and Ilokano, is treated as a prefix. The OT analysis is relatively simple. The morpheme /um/ is a prefix, so that, all else being equal, it will precede a following verb: *um-asim-* 'turn sour', *um-akyat-* 'teach', and so forth. However, prosodic constraints like NO-CODA (a syllable cannot have a coda) take precedence over initial alignment of the prefix. If prefixing /um/ would give rise to an otherwise unnecessary closed syllable, the /um/ string is shifted forward into the word, giving rise to seeming infixation: *k-um-uha-* 'get' (****um-kuha-*), *t-um-awag-* 'call' (****um-tawag-*), and so forth.[3] Now consider the problems posed by Leti for the OT approach. In (1a), /ni/ is infixed, yielding *k-ni-aati*, though prefixation would give ****ni-kaati*. The infixed form contains a consonant cluster and a vowel cluster, while the unattested prefixed form has optimal CV structure throughout. Or, consider

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2. IPA transcriptions are given in square brackets. Throughout, standard orthography adopted in van Engelenhoven (1995a) is used (see example [1]), with the exception that unstressed high vowels /i, u/, which are realized as glides before following vowels, are written as "i" and "u." Though these vowels are devocalized, they function as vowels for all relevant phonological phenomena. For example, glottal stop is inserted before word-initial vowels: in forms like *i-atu* 'knowledge', a glottal stop is inserted before the high vowel, yielding surface [jatu]. Stress falls on the penultimate syllable of lexical roots (see van Engelenhoven 1995a:62–66). Compare *ria* [ria] 'man', where the stressed vowel is not devocalized, and *riarma* [rjarma] 'inside', with devocalization of the pretonic high vowel. Single asterisks mark historical reconstructions, and double asterisks mark unattested forms (which are not necessarily phonologically illicit, but simply not the instantiations of the morpheme combinations discussed here). The nominalization database on which this study is based is given in full in the appendix.

forms like (d.ii). Here, /ni/ occurs as a prefix, and we find *ni-atu*, not **anitu. If the syllabifications are *ni.a.tu* and ***a.ni.tu*, then both forms have the same number of onsetless syllables, though the prefixed form has a vowel cluster that could be eliminated by infixation.[4] In short, infixation in Leti often gives rise to phonotactically nonoptimal strings that could be avoided by simple prefixation. Are we to conclude that infixation is a primitive operation? Or, are additional featural, phonotactic, and/ or prosodic constraints operative in determining Leti infixation?

2. NOMINALIZATION IN LETI. The NOM morpheme illustrated in table 1 serves to change a nonstative verb into a noun.[5] While stative verbs never take the NOM morpheme described in section 1, all nonstative verbs in Leti can undergo this type of nominalization, with only a few exceptions.[6] Typically, the derived noun formed via NOM affixation to a verb V is a noun meaning 'the act of V-ing', or, the obvious concrete result of the activity. Examples in table 2 are representative of the semantic associations between verbs and derived nominals. A small number of derived nominals appear to have lexicalized meanings: *t-n-utu* 'hammer' from *tutu* 'to pound'; *t-n-utnu* 'beak' from *tutnu* 'to pick'; *l-i-èta* 'custom, tradition' from *lèta* 'to have a village'.

In addition to heading noun phrases, nominalized verbs are used in formation of the progressive aspect. In this construction, a nominal is used as object of the verb *èla* 'to be (temporarily) at': *mu-èla kari* 'you are at work' (*kari* 'work, N'); *mu-èla nia-mmali* 'you (SG) are laughing', where *nia-mmali* is a nominalized form of the verb stem *mmali-* 'to laugh'. Another function of nominalized forms is in expressing resultative aspect. Consider pairs like *l-lòkra* (/n-lòkra/) 'he swears' and *na*-[l-i-òkra] 'he has sworn', where the resultative verb stem, in square brackets, is identical to the nominalized form, or *n-navu* 'he sows' and *na*-[n-i-avu] 'it has been seeded', where again, the bracketed stem is the NOM form. Despite the

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3. Crowhurst (1998) demonstrates that cognate infix /-um-/ in Toba Batak must be subject to additional phonological constraints, because infixation is blocked just in case assimilation is possible between /um-/ and the stem-initial C. Crowhurst adheres to the basic OT view that /um-/ is a prefix driven to infixal position by highly ranked phonological constraints.

4. As noted in footnote 2, prevocalic high vowels undergo devocalization, so that the surface form of *ni.a.tu* is [nja.tu]. While this surface form has fewer onsetless syllables, it has a complex onset, which is also a marked structure in Leti, occurring only in word-initial position.

5. Stative verbs have a distinct nominalization pattern that involves zero nominalizations that obligatorily occur with possessive suffixes. So, we find pairs like *vitna* 'to be fat' and *vitan-ku* 'my fatness'; *murnu* 'to be tanned' and *muran-mu* 'your tannedness', etc. The CV/VC alternations are due to regular metathesis. See van der Hulst and van Englelenhoven (1995), Hume (1997, 1998) and Blevins and Garrett (1998:541–547) for details of the metathesis alternations.

6. These exceptions are the transitive verbs *èla* 'to take' and *vena* 'to say, want', and the intransitive verbs *mori* 'to live; to give birth' and *tmuèla* 'to darken'. While nominalization of *èla* 'to take' may be blocked on analogy with homophonous stative *èla* 'to be temporarily at', lexical nouns *mormiori* 'living', *mèl-mèla* 'dark, darkness' (from *mèla* 'night') may block productive morphology for other nonstative verbs.

TABLE 2. NOM + V 'ACT OF V-ING', 'RESULT OF V-ING'

kakri	'to cry'	k-ni-akri	'act of crying'
kasi	'to dig'	k-ni-asi	'act of digging'
kili	'to look'	k-n-ili	'act of looking'
kini	'to kiss'	k-n-ini	'act of kissing, kiss'
davra	'to cut'	d-i-avra	'act of cutting, cut'
dèdma	'to smoke'	d-i-èdma	'act of smoking'
osri	'to hunt'	i-osri, ni-osri	'act of hunting'
otlu	'to push'	i-otlu, ni-otlu	'act of pushing'
pèpna	'to fence'	p-ni-èpna	'act of fencing, fence'
polu	'to call'	p-ni-olu	'act of calling, call'
surta	'to write'	s-n-urta	'act of writing, memory'
tutu	'to support'	t-n-utu	'act of supporting, support'

range of meanings and uses for nominalizations, the allomorphy exhibited by the NOM affix is regular and predictable, as I now demonstrate.

3. PREDICTING NOM ALLOMORPHY. Consider the eight allomorphs of NOM in table 1. Van Engelenhoven (1995a:82–84) describes the allomorphy as being both lexically and phonologically determined. A summary of his description is given in table 3, following the classification in table 1.[7]

The phoneme inventory of Leti is shown in (1). By this categorization, the relevant class of nonnasal nonalveolar consonants is /p, v, t, s, k/.

(1) Leti phonemes
CONSONANTS   VOWELS
labial: p, m, v [β]   high: i, u
dental: t, n, s   nonhigh: e, è [ε], o, ò [ɔ], a
alveolar: d, l, r
velar: k

One basic aspect of van Engelenhoven's description is not accurate. The NOM prefixal allomorph *nia-*occurs not only with vowel-initial and CC-initial stems, but also with a range of CV-initial stems. A representative sample of CV-initial stems taking *nia-* is shown in table 4. The classification in table 3, then, is incorrect both with respect to the distribution of *nia-* and the distribution of NOM infixal allomorphs *-ni-*, *-n-*, and *-i-*, because table 4 includes verb stems with initial nonnasal nonalveolars followed by nonhigh vowels (a, b, d); initial alveolars followed by high vowels (e); and initial alveolars followed by nonhigh vowels (f–g).

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7. Actually, there appear to be several typographical errors in van Engelenhoven's (1995a:82–83) description of infixal allomorphy. On p. 83 he writes ". . . {n} which is infixed, when the stem has an initial nasal or alveolar consonant followed by a high vowel . . . ," though the examples show stems with initial *non*nasal and *non*alveolar consonants. And later on p. 83 "Stems with an initial nasal or alveolar consonant preceded by a high vowel never have the infix." But again, the examples suggest that he means stems with an initial nasal or alveolar *followed* by a high vowel.

TABLE 3. NOM ALLOMORPHY FOLLOWING VAN ENGELENHOVEN*

	NOM	DISTRIBUTION
a.	-ni-	used when the stem has an initial nonnasal or nonalveolar consonant followed by a nonhigh vowel
b.	-n-	used when the stem has an initial nonnasal or nonalveolar consonant followed by a high vowel
c.	-i-	used when the stem has an initial nasal or alveolar consonant followed by a nonhigh vowel
d.i.	i-	used when the stem has an initial nonhigh vowel
d.ii.	ni-	optionally used instead of the i-prefix
e.	Ø	used with stems with an initial nasal or alveolar consonant followed by a high vowel
f.	nia-	used with a lexically defined set of vowel-initial stems, and with all CC-initial stems
g.	i-, -i-	used only with *naaru* 'to chew betel', *nòa* 'to advise', and *natu* 'to send'

*   van Engelenhoven 1995a:82–83

TABLE 4. /NIA-/ NOM WITH CV-INITIAL VERB STEMS

VERB ROOT		DERIVED NOMINAL	
a. keni	'to put, place'	nia-keni	'act of putting, placing'
b. kèrna	'to dry (TR)'	nia-kèrna	'act of drying something'
c. tuòna	'to ask'	nia-tuòna	'act of asking, question'
d. vòka	'to assemble'	nia-vòka	'act of assembling, assembly'
e. liosri	'to say farewell'	nia-liosri	'farewell party'
f. laava	'to walk'	nia-laava	'act of walking, walk'
g. lòla	'to explain'	nia-lòla	'explanation'

3.1 VERB CONJUGATION CLASS. Close inspection of verb/nominalization pairs reveals that the definitive property of verbs taking *nia-* versus all others is their inflectional conjugation class. As shown in table 5, Leti verbs fall into one of two conjugation classes with respect to subject-marking prefixes. Conjugation class is determined in part phonologically, and in part lexically, as detailed in (2).

(2) Leti verb classes
  CLASS I (FULL PREFIXES)
      Phonological selection: all CC-initial stems
      Morphological selection: nonstative verb stems derived (without overt morphology) from noun stems or verb stems; verbs derived via CV-reduplication from Class I verb stems
  CLASS II (REDUCED PREFIXES)
      Elsewhere (i.e., not selected as Class I)[8]

The overriding generalizations are that zero derivation of class II stems will move them into class I, provided that they are nonstative verbs. Apart from this, phonological selection governs. CV- reduplication, however, has no effect on conjuga-

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8. The notion of morphological verb classes is my own. Van Engelenhoven (1995a:121–124) details the distribution of full versus reduced verbal prefixes, but does not make use of this morphological distinction elsewhere.

tion class (i.e., a class I stem will not shift to Class II under CV-reduplication.) Class I verbs derived from noun stems are shown in table 6. In general, the meaning of the verb is some verbal act giving rise to or involving the root noun.

Recall also that NOM forms act as zero-derived verb stems for resultative constructions. In these cases as well, the derived resultative verb conjugates as class I, independent of its phonological make-up. Inflected nonresultatives are paired with inflected derived resultatives in table 7. Note the last three resultatives in the table, which are derived CV-initial stems, but which still occur with full (Class I) inflectional prefixes.

In table 6 and table 7 then, CV-initial and V-initial derived verb stems take the full (Class I) forms of the subject agreement prefixes, not the phonologically expected (Class II) reduced forms. Verb semantics appears to play a role in this kind of denominalization. As shown in table 8, verbs with stative (or unaccusative) semantics fall into class II. Related class I and class II verbs are shown in table 9 with their distinct third-person singular forms.

In table 10, Class I verbs (by phonological criteria), are shown to remain in Class I under CV-prefixing reduplication, despite the change in phonological form. If phonological criteria alone played a role in conjugation class, we would expect these verbs to shift to Class II, but they do not.[9]

TABLE 5. LETI VERB INFLECTIONAL PREFIXES

	CLASS I (FULL)	CLASS II (REDUCED)	
		A. PLAIN	B. WITH METATHESIS OF HIGH VOWELS
1SG	(a)u-	(a)u-	(a)-C*-u-
2SG	mu-	mu-	m-C-u-
3SG	na-	n-	n-
1PLEX	ma-	(a)m-	(a)m-
1PLINC	ta-	t-	t-
2PL	mi-	mi-	m-C-i-
3PL	ra-	r-	r-

*   C = stem-initial consonant

TABLE 6. CLASS 1 (NONSTATIVE) VERBS
DERIVED FROM NOUNS

NOUN		CLASS I VERB (3SG)	
kòta	'word'	na-kòta	'he/she says'
kou	'bractlet'	na-kou	'to shut'
lipa	'flower'	na-lipa	'to bloom'
lira	'language'	na-lira	'he/she makes a sound'
lolu	'front'	na-lolu	'he/she precedes'
lutna	'debt'	na-lutna	'to have/make debts'
raani	'blouse'	na-raani	'to wear a jacket'
riri	'pole'	na-riri	'he/she erects'
rita	'roof'	na-rita	'to roof s.t.'

9. Partial CV reduplication is commonly infixed rightwards after the stressed vowel. However, if the stressed syllable has a geminate onset, reduplication surfaces as a CV- prefix. The maintenance of conjugation class likely reflects the infixal origin of CV- reduplicative prefixation.

TABLE 6. CLASS 1 (NONSTATIVE) VERBS
DERIVED FROM NOUNS (CONT'D)

NOUN		CLASS I VERB (3SG)	
ruma	'house'	na-ruma	'he/she has a house'
sek-ni	'game'	na-seki	'he/she plays w/ s.t.'
talna	'friend'	na-talla	'he/she has friends'
tiatki	'tyatik'	na-tiatki	'to chant tyatiks'
vesi	'paddle'	na-vesi	'to paddle'
vòa	'fruit'	na-vòa	'to carry fruit'
vòk-ne	'clump'	na-vòka	'to gather, assemble (TR, INTR)'
ara	'war'	na-ara	'to make war'
irnu	'nose'	na-irnu	'he/she smells'
iap-ni	'construction'	na-iapi	'he/she makes'
uaara	'root'	na-uaara	'to take root'
upa	'grandchild'	na-upa	'to have grandchildren'

TABLE 7. CLASS I RESULTATIVE VERBS DERIVED FROM NOM FORMS

NONRESULT VERB (CLASS II)		RESULTATIVE VERB (CLASS I)	
m-paari	'he pays'	na[p-ni-aari]	'it is paid'
r-pali	'they float'	ra-[p-ni-ali]	'they have anchored'
t-sòi	'we (INCL) shift'	ta-[s-ni-òi]	'we (inc) inherit'
r-sòlka	'they close'	ra-[s-ni-òlka]	'they are closed'
m-d-i-allu	'you (PL) fetter'	mi-[d-i-allu]	'you are fettered'
l-lòkra	'he swears'	na[l-i-òkra]	'he has sworn'
n-navu	'he sows'	na[n-i-avu]	'it (the garden) has been seeded'

TABLE 8. CLASS II (STATIVE) VERBS DERIVED FROM NOUNS

NOUN		CLASS II VERB (3SG)	
kari	'work'	n-kari	'to work (e.g., 'the machine is working')'
mati	'dead'	n-mati	'to die'
mòla	'shy'	n-mòla	'to be shy'
sala	'mistake'	n-sala	'to be wrong'
vava	'utterance'	n-vava	'to be named'

TABLE 9. RELATED CLASS II AND CLASS I VERBS

CLASS II (3SG)		CLASS I (3SG)	
m-pali	'to float'	na-pali	'to keep (s.t.) afloat'
m-molu	'to disappear'	na-molu	'to let (s.t.) disappear'
n-vèèta	'to pull'	na-vèèta	'to drag (s.t.)'
n-kernu	'to descend'	na-kernu	'to lower (s.t.)'
n-masa	'to be tired'	na-masa	'to take long'
n-mòla	'to be shy'	na-mòla	'to embarass (s.o.)'

TABLE 10. CONJUGATIONAL STABILITY UNDER CV- REDUPLICATION

CLASS I (3SG)		RED (3SG)	
na-ppèrta	'to be heavy'	na-pè-ppèrta	'to get heavy'
na-kkusla	'to be small'	na-ku-kkusla	'to get small'
na-mmali	'to laugh'	na-ma-mmali	'(someone) he laughs at'

With this background, we are now able to predict the basic allomorphs of
NOM. Verbs in class I (those with full subject agreement prefixes) are prefixed

with /nia-/. Verbs in class II (those with reduced subject agreement prefixes) are infixed with /-ni-/ (before the first vowel in the stem). For the moment, I propose the two basic morphological rules in (3).

(3) Basic NOM allomorph selection
      a. [VERB$_{classI}$]NOM → [nia[. . .]$_V$]NOM
      b. [VERB$_{classII}$]NOM → [[(C)-ni-V. . .]$_V$]NOM

Rule (3a) spells out NOM as the prefix *nia-*. Rule (3b) realizes NOM as an infix *-ni-* that is placed before the first vowel of the verb stem. For vowel-initial stems then, the infix appears as a prefix.[10] Looking back at table 1, where the eight allomorphs of NOM are distinguished, we see that (3) accounts for (a), the *-ni-* infix; (d.ii) the *ni-* prefix (for vowel-initial stems); and (f), the *nia-* prefix. The appendix, which includes all attested nominalizations, confirms that all verbs with *nia-* are class I, while those with infix *-ni-* are class II. Representative examples are given in table 11. The remaining five allomorphs are analyzed in the following three subsections.

TABLE 11. ILLUSTRATION OF THE BASIC NOM ALLOMORPHS ASSOCIATED WITH VERB CLASS

a. [VERBCLASS I]NOM → [nia[. . .]$_V$]NOM

I. PHONOLOGICALLY CONDITIONED VERB CLASS

CLASS I (3SG)		NOM	
na-kdiori	'to steal'	nia-kdiori	'stealing'
na-ltieri	'to speak'	nia-ltieri	'act of speaking, speech'
na-mtaatu	'to be afraid'	nia-mtaatu	'act of being afraid, fear'
na-snurna	'to spin'	nia-snurna	'act of spinning'
na-trima	'to receive'	nia-trima	'receipt'
na-mmali	'to laugh'	nia-mmali	'laughing'

II. MORPHOLOGICALLY CONDITIONED VERB CLASS

na-keni	'to put, place'	nia-keni	'act of putting, placing'
na-laava	'to walk'	nia-laava	'act of walking, walk'
na-liosri	'to say farewell'	nia-liosri	'farewell party'
na-vòka	'to assemble'	nia-vòka	'act of assembling, assembly'
na-iapi	'to make'	nia-iapi	'act of making'
na-olu	'to sell'	nia-olu	'sale'
na-itra	'to increase'	nia-itra	'increment'

b. [VERBCLASS II]NOM → [[(C)-ni-V . . .]$_V$]NOM

CLASS II (3SG)		NOM	
n-kakri	'to cry'	k-ni-akri	'act of crying'
m-pali	'to float'	p-ni-ali	'act of floating'
n-sai	'to climb, rise'	s-ni-ai	'act of climbing, rising'
n-teti	'to chop'	t-ni-eti	'chop, chopping'
n-vaka	'to ask (for)'	v-ni-aka	'act of asking, request'
n-va-nunsu	'to kneed'	v-ni-anunsu	'massage'
n-atu	'to know'	ni-atu	'knowledge'
n-odi	'to carry'	ni-odi	'act of carrying, pole, load'
n-osri	'to hunt'	ni-osri	'hunt, hunting'

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10. Justification of NOM as an infix, as opposed to an OT-like analysis where a prefix /ni-/ is shifted into the stem for overriding phonological reasons, is provided in section 5.

3.2 PHONOLOGICALLY DETERMINED ALLOMORPHY.

The *-n-* allomorph of NOM (table 1 [b]) is a predictable realization of *-ni-* when *-ni-* is adjacent to a high vowel. A general phonological rule in Leti deletes the first in a sequence of high vowels across a morpheme boundary, as shown in (4).

(4) High vowel deletion $V_{[+hi]} \rightarrow \emptyset / \_\_ V_{[+hi]}$

UNDERLYING	SURFACE	
ari 'skin'+ ulti 'tail'	ar-ulti	'ray's skin'
lau 'civet' + irnu 'nose'	la-irnu	'civet's nose'
urnu 'breadfruit' + ipra 'slice'	urn-ipra	'slice of breadfruit'

Representative class II verbs with surface *-n-* from *-ni-* are shown in table 12.

TABLE 12. ILLUSTRATION OF -N- AS A RESULT OF -NI- SELECTION AND HIGH VOWEL DELETION

$[VERB_{CLASS\ II}]NOM \rightarrow [[(C)-ni-V \ldots]_V]NOM$

CLASS II (3SG)		NOM	
n-kini	'to kiss'	k-n-ini	'act of kissing, kiss'
n-suri	'pour'	s-n-uri	'pour, pouring'
n-tutu	'to point'	t-n-utu	'act of pointing'
n-tuuni	'to fall'	t-n-uuni	'act of falling, fall'
n-virna	'to peel'	v-n-irna	'act of peeling'

The *-i-* allomorph of NOM (table 1 [c]) is also a predictable realization of *-ni-* for a subset of C-initial stems. The relevant rules are shown in (5): (5a) deletes /n/ when it is preceded by an alveolar noncontinuant consonant /d, l/ (recall that /t, s, n/ are all dentals; /r/, an alveolar trill, is continuant); (5b) deletes the /n/ of NOM when preceded by a nonsyllabic sonorant, that is, before /m, n, r, l, ʔ/ (see below where glottal stop is discussed).[11] Rule (5a) can be stated generally for the language, because word-internal [dn] and [ln] clusters are absent in Leti. But (5b) cannot be stated generally, because underlying and derived initial clusters /rn, nn, mn/ are found: *r-nani* 'they swim'; *nnèi* 'sign', *n-nasu* 'he boils'; *mnina* 'to be calm', *m-n-u-asu* 'you boil'; and so forth.

(5) n-deletion for NOM
        a. $n \rightarrow \emptyset$ / [+cons, alveolar, –cont] __
        b. $n \rightarrow \emptyset$ / [–syll, +son] [__ . . . .] NOM

Representative class II verbs with *-i-* are shown in table 13.

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11. Compare Toba Batak patient-oriented noun-forming *ni-/-in-*. The prefix *ni-* is found only before stems beginning with {d, l, r} or before nasal-initial stems. Elsewhere, the infix *-in-* is found. If we ignore the prefixal vowel, we can say that where there is place or manner agreement between the prefix *n-* and the following stem-initial consonant, infixation is blocked. This might be the historical origin of the alternations in (5), though synchronically there is no strong argument for /n-C-i-V . . . / in Leti NOM forms. A /n-C-i-V . . . / analysis would require a rule of nasal-metathesis, where nasal metathesis is blocked just in case there is place or manner agreement between prefixal *n-* of NOM and the stem-initial C. See section 4, where this metathesis alternative is considered.

TABLE 13. ILLUSTRATION OF /-I-/ AS A RESULT OF -NI- SELECTION AND N-DELETION

[VERB$_{CLASS\ II}$]NOM → [[(C)-ni-V . . .]$_V$]NOM

i. *n*-deletion (5a)

CLASS II (3SG)		NOM	
n-davra	'to cut'	d-i-avra	'act of cutting, cut'
n-dena	'to stay'	d-i-ena	'act of staying, staying place'
l-lèvra	'to disperse s.t.'	l-i-èvra	'dispersal'
l-lòi	'to dance'	l-i-òi	'act of dancing'

ii. *n*-deletion (5b)

n-mai	'to come'	m-i-ai	'arrival'
n-nasu	'to cook'	n-i-asu	'cooking'
n-navu	'he sows'	n-i-avu	'the act of sowing'
n-resi	'to win'	r-i-esi	'victory'
n-ròra	'to draw (a line)'	r-i-òra	'line'

Where a class II verb is nominalized, and the structural descriptions of both high vowel deletion and *n*-deletion are met, the string /-ni-/ appears to be deleted in its entirety, instantiating the zero allomorph of NOM (table 1 [e]). Examples are shown in table 14.

TABLE 14. ZERO NOM AS A RESULT OF -NI- SELECTION, N-DELETION, AND HIGH-VOWEL DELETION

[VERB$_{CLASS\ II}$]NOM → [[(C)-ni-V . . .]$_V$]NOM

CLASS II (3SG)		NOM	
n-divri	'to smash'	divri	'smashing'
n-ruru	'to tremble'	ruru	'trembling'

3.3 VARIATION. Two sets of NOM forms show variation. Recall from above that nonhigh vowel-initial Class II stems take *ni-:* the *-ni-* infix, which surface as a prefix before the stem-initial vowel. However, *ni-* is only found optionally in colloquial speech. The variant form is *i-*. The appendix shows variant forms for all class II nonhigh vowel-initial forms. Representative examples are given in table 15.

TABLE 15. VARIATION WITH -NI- SELECTION: NI-, I- WITH V-INITIAL STEMS

[VERB$_{CLASS\ II}$]NOM → [[(C)-ni-V . . .]$_V$]NOM

CLASS II (3SG)		NOM	
n-atu	'to know'	i-atu, ni-atu	'knowledge'
n-odi	'to carry'	i-odi, ni-odi	'act of carrying, carrying pole, load'
n-osri	'to hunt'	i-osri, ni-osri	'hunt, hunting'

What has triggered *n*-deletion in vowel-initial forms? The answer appears to be glottal stop. Vowel-initial words in Leti can be preceded by a glottal stop.[12] Given the rule in (6), which deletes /n/ after glottal stop, the variant nominalized forms in

table 15 are derived by assuming that input to NOM can be either the underlying vowel-initial stem or the glottal-stop–initial stem.

(6) More *n*-deletion: n → Ø / ?__   (a subcase of 5b)

In the first case, the surface NOM forms shows a *ni-* prefix, as described above, while in the second case, rule (5b) applies, and the surface NOM forms show the *i-* prefix (table 1 [d.i]), as illustrated in (7).

(7) *n*-deletion in class II vowel-initial stems

Input	/atu/ CLASS II + NOM	/?atu / V CLASS II + NOM
Spell-out	ni-atu	?-ni-atu
Rule (5b)	n.a.	?iatu
Surface	niatu	?iatu

Another case of variation is found with class II verbs taking the /va-/ prefix. This prefix serves many different functions, the most common being the derivation of reciprocals and causatives. As shown in table 11(b), the expected, and attested NOM form for Class II va- stems is *-ni-* infixation. In colloquial speech, however, an *-n-* infix is optionally attested. The attested variation is exemplified in table 16.

**TABLE 16. VARIATION WITH -NI- SELECTION:
NI-, N- WITH DERIVED VA- STEMS**

[VERB_{CLASS II}]_{NOM} → [[(C)-ni-V . . .]_V]_{NOM}

CLASS II (3SG)		NOM	
n-va-nunsu	'to knead'	v-ni-anunsu, v-n-anunsu	'massage'
n-va-sernu	'to exchange'	v-ni-asernu, v-n-asernu	'exchanging, exchange'
n-va-sia	'to prepare'	v-ni-asia, v-n-asia	'preparations'
n-va-sniara	'to sing'	v-ni-asniara, v-n-asniara	'singing'

In this instance, regular high-vowel deletion (4) cannot account for the variation. I propose the optional rule of pretonic reduction stated in (8). In pretonic position, the high vowel /i/ is realized as a glide before nonhigh vowels; this glide is optionally lost when preceded by a consonant cluster.

(8) Reduction of pretonic syllables (optional)
G → Ø / CC_V [σ_s σ_w]

3.4 DOUBLE AFFIXATION. The last pattern to be accounted for is the most peculiar. The pattern in table 1 (g) appears to involve both an /i-/ prefix, and an /-i-/ infix. Stems taking this allomorph are class I stems, and all stems beginning with the segmental sequence *na* . . . fall into this class. I analyze this as a case of double NOM-marking, but in terms of ambiguity between a class I and class II stem. The table 1 (g) pattern is repeated in table 17.

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12. Van Engelenhoven (1995a:46) states that "all vowels are preglottalized in word initial position."

TABLE 17. DOUBLE AFFIXATION WITH NA-INITIAL STEMS

CLASS I (3SG)		NOM	
na-naaru	'to chew betel'	i-n-i-aaru	'act of chewing betel' (**nia-naaru)
na-natu	'to send'	i-n-i-atu	'act of sending, dispatch' (**nia-natu)

In (9), I suggest how misanalysis of the stem as a prefix-stem complex has given rise to the attested pattern. In (9i), *na . . .*-initial roots are misanalyzed (presumably historically) as class I prefix-stem words due to the identity between the initial CV- sequence and the class I 3SG prefix /na-/. As class I stems, the remainders ([aru] and [tu]) follow rule (3a), taking nominalizing prefix /nia-/. In (9ii), *na . . .*-initial roots are misanalyzed (presumably historically) as class II prefix-stem words, due to the identity between the initial C- and the class II 3SG prefix /n-/. As class II stems, the stem remainders ([aaru] and [atu]) follow rule (3b), taking nominalizing *-ni-*. The derived form follows other class II vowel-initial stems in undergoing *n*-deletion (6), despite the absence of stem-initial glottal stop in any surface form of these stems. A peculiar aspect of this derivation is the seeming phonological invisibility of *nia-* for the second nominalization. It appears that the double nominalization occurs in parallel, with sequencing of prefixes determined phonologically: [i-] must appear at the word-edge, because this is the only position where the glottal-stop-inducing /n/-deletion could appear.

(9) Reanalysis of *na*-initial class I stems as prefix-stem
     [. . .] = stem; < > = base of affixation
  i.   reanalysis

STEM	ANALYSIS I	1ST NOMINALIZATION	(table 1[f], [3a])
[naaru]	na-[aru]	nia-[aru]	
[natu]	na-[tu]	nia-[tu]	

  ii. alternate analysis

	ANALYSIS II	2ND NOMINALIZATION	(table 1[d.i], [3b], [6])
	n-[aaru]	i-<niaaru>	
	n-[atu]	i-<niatu>	

Though van Engelenhoven (1995a) assumes that the pattern illustrated by table 1 (f) is a lexical property of verb stems, it falls within the general allomorphy rules already suggested for other verbs. As far as I am aware, all class I verb stems that themselves are *na*-initial or were *na*-initial historically (*nòa* 'advise' < *nara) fall into the double-affixation class. The only other peculiarity of these double-affixed forms is the absence of variation: along with *iniaaaru* and *iniatu* we expect the unattested variants **niniaaru* and **niniatu,* where stems are analyzed as truly vowel-initial and rule (5b) has not applied.

   Having analyzed the infixal allomorphy of NOM in terms of morphological and phonological selection, I turn to the second problem. Does Leti require specification of *-ni-* as an infix, or can its infixal status be derived by prefixation and a set of constraints that essentially force it away from the edge of the word into the stem? First, however, an alternative morphological analysis must be considered.

4. REDUCING TWO ALLOMORPHS TO ONE. The analysis of Leti NOM affixation presented in section 3 is summarized in (10).

(10) Summary of analysis of NOM allomorphy
      Basic NOM allomorph selection:

$$[\text{VERB}_{\text{CLASS I}}]_{\text{NOM}} \rightarrow [\text{nia}[\ldots]_V\,]_{\text{NOM}} \qquad (3a)$$

$$[\text{VERB}_{\text{CLASS II}}]_{\text{NOM}} \rightarrow [[(\text{C})\text{-ni-V}\ldots]_V\,]_{\text{NOM}} \qquad (3b)$$

      General phonological rules:

$$V_{[+hi]} \rightarrow \emptyset\,/\,\_\,V_{[+hi]} \qquad (4)$$

$$n \rightarrow \emptyset\,/\,[\text{+cons, alveolar, –cont}]\,\_\_ \qquad (5a)$$

$$G \rightarrow \emptyset\,/\,CC\_V\,[\sigma_s\ \sigma_w] \qquad (8)$$

      Morphologically conditioned rules:

$$n \rightarrow \emptyset\,/\,[\text{–syll, +son}]\,[\_\_\,\ldots]_{\text{NOM}} \qquad (5b)$$

However, the association of *nia-* with class I verbs that take the 3SG agreement marker *na-,* and *-ni-* with class II verbs that take the 3SG agreement marker *n-,* makes it possible to collapse the basic allomorph-selection rules by taking the 3SG verb form as the base of nominalization. If we do this, NOM reduces to *-i-,* infixed before the first vowel of the base.[13] The model is then as in (11), with nominalized verbs schematized in (12).

(11) Third-person singular as the base for NOM /-i-/ infixation
      NOM = /-i-/, infixed before first vowel of base
      Base of NOM = 3SG verbform

(12) Nominalizations of class I and class II verbs
      i. [n-i-a[. . .]$_{\text{VclassI,3SG}}$]NOM
      ii. [[n-(C)-i-V. . .]$_{\text{VclassII,3SG}}$]NOM

While this simplification of NOM allomorphy, and direct association of third-person singular forms with NOM forms, is desirable, there is an obvious problem. For class II verbs, the third-person singular prefix /n-/ is in the wrong position. In addition to affixation, a rule of metathesis is needed to move prefix /n-/ adjacent to the NOM infix. The rule would look as in (13):

(13) *n*-metathesis in NOM verb forms
      [[n-C-i-V. . .]$_{\text{VCLASS II,3SG}}$]NOM $\rightarrow$ [[C-n-i-V. . .]$_{\text{VCLASS II,3SG}}$]NOM

While a general C/V metathesis process occurs across morpheme boundaries in Leti, there are no other instances of C/C metathesis in the language. How then are we to evaluate the two analyses, one involving dual allomorphy with unaccounted-for homophony between NOM allomorphs and third singular verb class prefixes,

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13. It is important to point out that, although morpheme-final high vowels metathesize with following consonants in the appropriate morphological environments in Leti (van Engelenhoven 1995a; van der Hulst and van Englelenhoven1995; Hume 1997, 1998; Blevins and Garrett, 1998:541–547), the positioning of the /-i-/ infix for class II verbs (12ii) cannot be an instance of prefixal /i-/ metathesis when the verb stem is C-initial, because this would involve metathesis over an intervening CC-cluster, something that never occurs in Leti. Metathesis is consistently blocked by CC clusters. The only way of collapsing the positioning of NOM, then, is to assume that /-i-/ is an infix.

and the other greatly simplified system that invokes the morphologically conditioned metathesis rule in (13)?[14]

Recall from section 3 the discussion of variation for vowel-initial class II stems (table 1 [d.i, d.ii]). Variation between forms like *ni-atu* and *i-atu* was attributed to the possibility of the base of NOM being vowel-initial in the first case, and glottal-stop–initial in the second case, with derivations as in (7). Now consider the alternative analysis, where the base of NOM affixation is the third-person singular verb form *n-atu*. Glottal stop is not inserted, because there is no vowel-initial base. With infixation, we have *n-i-atu*, and no motivation for deletion of the initial *n*. The existence of variant surface NOM forms *niatu, ʔiatu* suggests that the dual allomorph approach to Leti is probably the correct one. However, since the second problem I address in section 5 is the status of NOM as an infix, and its problematic phonotactics, both /-ni-/ and /-i-/ will be treated. Both pose similar problems for OT approaches to infixation, as I now detail, though the problems with /-ni-/ are slightly worse.

5. PROBLEMS WITH OT APPROACHES TO INFIXATION. As outlined in section 1, optimality approaches to infixation attempt to capture the fact that many infixes, like the Class II NOM of Leti, alternate between edge- and nonedge-positions. Stem-initially, a common pattern is a prefix of the form VC- that occurs as a prefix if the stem is vowel-initial, and as an infix just in case the base is consonant-initial. Roviana, a language of the Western Solomons shows a NOM morpheme *in-/-in-,* cognate with Leti NOM. However, the pattern of affixation in Roviana is the simple one just described. Roviana data (Waterhouse 1949, Tryon 1995) are presented in table 18.[15]

Optimality approaches (Prince and Smolensky 1991, 1992, 1993; McCarthy and Prince 1995) specify /in-/ as a prefix by alignment constraints, aligning the beginning of the prefixal morpheme with the beginning of the word. In vowel-initial stems, the alignment constraints are unviolated. However, with consonant-initial stems, phonological constraints override alignment constraints. A VC- prefix with a C-initial stem would give rise to the sequence [VC-C . . .]. The word-initial syllable is closed, constituting a violation of NOCODA, which states that syllables cannot be closed. Assuming that NOCODA dominates the affix-alignment constraints, the closed syllable can be eliminated by shifting the affix one segment ahead, to follow the stem-initial consonant. For vowel-initial stems, no closed syl-

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14. Morphosyntactic considerations are difficult to evaluate. For example, if one adheres to a model in which derivation is internal to inflection, then the metathesis analysis with an inflected verb form as the base for (derivational) nominalization appears to be highly marked and potentially suspect. On the other hand, it could be argued that the third-person singular verb form is the unmarked member of the inflectional paradigm, and that since nominalizations are used in formation of the progressive aspect, that what are termed "nominalizations" here are more gerundial in character, and hence not clearly within the domain of derivational morphology.

15. Interestingly, the Roviana pattern appears to be innovative within Austronesian. Ross (1995) and others reconstruct *ni-, -in- for the Proto-Austronesian nominalizer.

TABLE 18. ROVIANA /IN-/ NOM

I. CONSONANT-INITIAL STEMS

(le)-lete	'to plant'	l-in-ete-lete	'plant, crop'
moho	'sick'	m-in-oho	'sickness'
ɣani	'to eat'	ɣ-in-ani	'food'
tavete	'to work'	t-in-avete	'work'
toa	'alive'	t-in-oa	'life'
zama	'to say'	z-in-ama	'word, saying'
va-ɣila	'to show'	v-in-a-ɣila	'a sign'
vari-pera	'to fight'	v-in-ari-pera	'war, fighting'
vari-haba	'to marry'	v-in-ari-haba	'wedding'

II. VOWEL-INITIAL STEMS

avoso	'to hear'	in-avoso	'news'
ovia	'hungry'	in-ovia	'hunger'
ene	'to walk'	in-ene	'journey'
(um)-uma	'cultivate, till'	in-uma	'garden'

lable is produced, and the pattern is prefixal. The surface distribution of the /VC-/ prefix in languages with the Roviana pattern, then, is generally accounted for by assuming that a constraint against syllable codas dominates affix-alignment constraints.[16] The necessary constraints and constraint ranking are shown in (14).

(14) Constraints and constraint-ranking for surface distribution of Roviana /in-/ NOM

NoCODA: A syllable cannot be closed.

LEFTMOSTNESS: A prefix is located at the left edge of the word. (/in-/ is a prefix)

NoCODA >> LEFTMOSTNESS

But if there are no true infixes, then how are we to account for the NOM allomorph of Leti? Let us first examine the problems encountered with the /-ni-/ infix (as prefix) under the analysis making use of the rules in (3). The problem here is quite serious. In terms of prosody and phonotactics, /ni-/ is a perfectly well-formed syllable, and particularly well-positioned before the initial C of a class II verb. On the other hand, the output of infixation creates syllable-initial CC clusters and VV sequences, both of which are marked cross-linguistically and within Leti. (Syllable-initial CC clusters are only found word-initially in Leti, and vowel sequences give rise to vowel loss and glide formation.) What phonological constraint, then, could possibly be responsible for shifting the /ni/ string into post-consonantal position? A constraint against word-initial open syllables, or against word-initial /n/ is too strong: recall that the third-person singular prefix /na-/ for class I verbs is consistently realized as a prefix. Adopting either of these seemingly artificial constraints would require ordering the ad hoc constraint above the alignment

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16. This analysis is consistent with the general sound patterns of Roviana. Outside of CVC- reduplication, all syllables are open, suggesting that NoCODA is highly ranked. On the other hand, the existence of closed syllables under reduplication is anomolous in OT, because one should see the emergence of unmarked CV- syllables in this case, not marked CVC syllables.

constraints for /ni-/ but below the alignment constraints for other CV- or *n*-initial affixes. But this distinct ordering of morpheme-particular alignment constraints among phonological constraints is simply another way of saying that /-ni-/ is an infix, while /na-/ is a prefix.[17] In addition, recall the zero realization of *-ni-* in table 1 (e). The zero allomorph is a result of the general deletion of /i/ before another high vowel (3), and of the deletion of /n/ as stated in (5a,b). But under OT accounts, the surface NOM form *ruru* (from stem /ruru/) is unexpected, since unattested **ni-ruru violates no phonological constraint in the language.

In addition, under an OT account, unattested **ni-divri and **ni-ruru are more faithful than attested surface forms. Given this, there is a constraint-ordering paradox if infixation is a result of high-ranking phonological constraints. FAITHFULNESS/NOM must be high-ranked in order to prevent simple prefixation plus subsequent deletion of prefix segments where high-ranking phonological constraints like CODA and ONSET are violated, but the same faithfulness constraint must be low-ranked in order to allow partial or null realization of NOM in its infixal position.[18]

The /-i-/ infix-as-prefix analysis is somewhat easier to motivate. With one exception (first-person singular pronominal prefix /au-/), all verbal prefixes in Leti are consonant-initial. Given this, and the fact that vowel-initial words are typically preceded phonetically by glottal stop (see footnote 12), the constraint ONSET, which bars vowel-initial syllables, can be used to drive the /i-/ prefix into the stem. Under this analysis, ONSET dominates alignment constraints for bound verbal morphemes, and /i-/ moves to a nonedge position. For class I verbs, the /i/ lodges in the first position where it does not give rise to an ONSET violation, after the /n/ of the third-person singular prefix, resulting in the [n-i-a[. . .]$_{VclassI}$]$_{NOM}$ pattern (12i). (Recall from note 2 that /nia . . . / surfaces as [nja . . .].) For class II verbs, the /i/ is expected to lodge in the same position, giving unattested [[n-i-(C)V . . .]$_{classII}$]$_{NOM}$ instead of the attested [[n-(C)-i-V . . .]$_{VclassII}$]$_{NOM}$ pattern. Again, as in the /ni-/ analysis, the phonotactics of /i-/ in prevocalic posi-

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17. A reviewer suggests that infixation of /ni-/ is perhaps motivated by an output constraint that prefers disyllables to longer forms. For nonderived stems, which are disyllabic, infixation results in a surface disyllable, due to devocalization of /i/ (see footnotes 2, 4.) However, there are several problems with this approach. First, as shown in the appendix, class II derived verb stems with the prefix *va-* consistently take the *-ni-* infix, despite being trisyllabic. Second, there are many class I verbs that are disyllabic (*keni-* 'to put, place', *lòla-* 'to explain', etc.), indicating that rule (3a) of /nia-/ selection would need to be maintained. But if a constraint enforcing disyllabic output could force infixation of *ni-,* then it could do the same for *nia-*. Infixation of *nia-* would need to be blocked, since in principle **/k-nia-eni/ could surface as disyllabic [knjeni] through regular (independently motivated) rules of vowel deletion and devocalization. Finally, recall the behavior of pronominal prefixes like /mi-/ 2nd person plural: we find *mi-vlari* 'you all run' (/vlari-/ 'to run'), *mi-ɐmnu* ([mjemnu]) 'you all drink' (/emnu-/ 'to drink'), and *mkiari* ([mkjari]) 'you all work' (/kari-/ 'to work'). Given the regular process of metathesis, like that illustrated by *mkiari*, the question is why a disyllabic output constraint involves wholesale infixation, instead of simple metathesis. In other words, why does /ni-kaati/ (table 1 [a]) surface as [knjaati] rather than **[nkjaati]. Both have two surface syllables, and the unattested form involves the regular C/V metathesis alternation, while the attested form involves otherwise unattested CC metathesis as well.

18. An additional problem arises for monostratal versions of OT if the analysis I propose in (7) is the correct one for *n*-deletion in class II vowel-initial stems. Because *n*-deletion is triggered by a nonunderlying glottal stop, the question is how to assure input forms with and without glottal stop.

tion are worse than they would be for *n-i-*(C)V . . . , because the attested pattern fails to alter the word-initial CC cluster, and additionally creates a vowel cluster. Motivating the metathesis rule in (13) is perhaps the most difficult aspect of this analysis, though clearly independent of the status of infix as prefix. What we must understand is why /n/ metathesizes only in nominalizations with the /-i-/ infix, and not elsewhere (i.e., in class II third-person singular verbs).[19]

The clearest case of primitive infixation would be a language with two homophonous morphemes, one an infix, and the other a prefix or suffix. There is at least one Austronesian case like this, in Atayal (Li 1982, 1983, 1995), where various affixes indicate male forms of speech. One affix indicating a male form of speech is the infix *-i-,* which precedes the stem-final (stressed) vowel: *luhuŋ, luh-i-uŋ* 'mortar'; *ruluʏ, rul-i-uʏ* 'top of tree'. Compare this with the Atayal verbal imperative suffix /-i/: *pataʃ* 'to write' *pataʃ-i* 'write!'; *puŋ* 'to listen' *puŋ-i* 'listen!', and so forth. Note the vowel cluster produced by the infixal /-i-/, in addition to the maintenance of a final closed syllable. Because the class of male affixes include -CVC, -VC, -CV, -V suffixes in addition to -VC-, -V-, and -CV- infixes, it is difficult to argue that there are constraints that seek to maintain final closed syllables, or any other phonotactic generalization one might want to draw from the infixing examples here. When it comes to extremely productive morphology, however, we are left with languages like Leti, where the morphemes in question are not quite homophonous, but very close. The near homophony of Leti affixal morphemes is summarized in table 19. I have included two suffixes as well, though it is clear that the infix in question is defined in terms of the initial edge of the base.

TABLE 19. NEAR HOMOPHONY BETWEEN PREFIX/SUFFIX AND INFIX IN LETI

PREFIX	INFIX	SUFFIX
na- 'third-person singular'	-ni- NOM	-ni 3SG POSSESSIVE
mi- 'second-person plural'		
au- 'first-person singular'	-i- NOM	-e INDEXER

In summary, there appears to be no phonological motivation for the treatment of Leti /-ni-/ or /-i-/ as prefixes that have been shifted to infixal position due to dominant phonological constraints. The positioning of NOM in class II verbs must be morphologically specified in Leti, either in terms of the infixation rule in (3b) or (12ii), or some constraint-based equivalent. The aberrant phonotactic strings produced under infixation are not surprising, if, as Leti seems to demonstrate, infixes are primitive morphological units.

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19. A morphological paradigmatic approach is possible where output-output constraints hold of class II and class I nominalizations. If class I verbs are taken as regular, then class II NOM verbs may be subject to constraints that require that /-i-/ be prevocalic and post-/n/, as in class I nominalized verbs, yielding the attested surface pattern.

APPENDIX

LETI NOMINALIZATIONS

CLASS II VERBS

a. infix -ni- after stem-initial C (table 1[a])

3SG		NOM	
n-kakri	'to cry'	k-ni-akri	'act of crying'
n-kari	'to work'	k-ni-ari	'act of working'
n-kasi	'to dig'	k-ni-asi	'act of digging'
n-kaalu	'to shout'	k-ni-aalu	'act of shouting'
n-kaati	'to carve'	k-ni-aati	'act of carving, carving'
n-kèi	'to lift'	k-ni-èi	'act of lifting'
n-kernu	'to descend'	k-ni-ernu	'act of descending'
n-kèrta	'to cut, butcher'	k-ni-èrta	'act of cutting, butchering'
m-paari	'to pay'	p-ni-aari	'act of paying'
m-pali	'to float'	p-ni-ali	'act of floating'
m-pèpna	'to fence'	p-ni-èpna	'act of fencing, fence'
m-polu	'to call'	p-ni-olu	'act of calling, call'
n-sai	'to climb, rise'	s-ni-ai	'act of climbing, rising'
n-sakra	'to divide'	s-ni-akra	'act of dividing, division, part'
n-sernu	'to change (INTR)'	s-ni-ernu	'act of changing, change'
n-sòi	'to shift'	s-ni-òi	'act of inheriting, inheritance'
n-soli	'to dwell, live'	s-ni-oli	'way of living, tradition, custom'
n-sòlka	'to close'	s-ni-òlka	'act of closing'
n-sòpla	'to sail'	s-ni-òpla	'act of sailing'
n-sòpna	'to order'	s-ni-òpna	'order'
n-sòra	'to sew'	s-ni-òra	'act of sewing, sewing'
n-tasna	'to boil'	t-ni-asna	'act of boiling'
n-teti	'to chop'	t-ni-eti	'chop, chopping'
n-tèna	'to lean on a stick'	t-ni-èna	'stick'
n-tèpra	'to sink'	t-ni-èpra	'act of sinking'
n-tèrna	'to press'	t-ni-èrna	'act of pressing, pressure'
n-toli	'to see'	t-ni-oli	'act of seeing'
n-vaka	'to ask (for)'	v-ni-aka	'act of asking, request'
n-vali	'to turn, return'	v-ni-ali	'act of turning'
n-vòòna	'to fodder'	v-ni-òòna	'domestic stock'
n-vatèmna	'to store'	v-ni-atèmna	'act of storing, storage'
n-va-ròra	'to think over'	v-ni-aròra	'act of thinking, idea'
n-va-nunsu	'to kneed'	v-ni-anunsu	'massage'
n-va-sernu	'to exchange'	v-ni-asernu	'act of exchanging, exchange'
n-va-sia	'to prepare'	v-ni-asia	'preparations'
n-va-sniara	'to sing'	v-ni-asniara	'singing' (cf. sniara 'song')
n-va-suuti	'to butt (INTR)'	v-ni-asuuti	'butting'
n-va-kini	'to kiss (e.o.)'	v-ni-akini	'reciprocal kiss(ing)'
n-va-lèvra	'to disperse'	v-ni-alèvra	'dispersion'
n-va-lòla	'to justify'	v-ni-alòla	'justification, explanation'
n-va-snurta	'to remember'	v-ni-asnurta	'remembering'
n-va-tèrsa	'to make s.t. firm'	v-ni-atèrsa	'firm binding'
n-va-dinni	'to smooth s.t.'	v-ni-adinni	'smoothing of s.t.'
n-va-kdiori	'to wander around'	v-ni-akdiori	'wandering'

b. infix -n- after stem-initial C (table 1 [b])

3SG		NOM	
n-kikni	'to lift'	k-n-ikni	'lifting'
n-kili	'to look'	k-n-ili	'act of looking'
n-kini	'to kiss'	k-n-ini	'act of kissing, kiss'
n-sia	'to do'	s-n-ia	'act of doing, garden'
n-suri	'to release'	s-n-uri	'release; nondomestic stock'
n-suri	'to pour'	s-n-uri	'pour, pouring'
n-surta	'to write'	s-n-urta	'writing, memory'
n-suuti	'to butt'	s-n-uuti	'butting against s.t.'
n-tutu	'to pound'	t-n-utu	'hammer'
n-tutu	'to point'	t-n-utu	'act of pointing'
n-tutu	'to support'	t-n-utu	'act of supporting, support'
n-tutnu	'to pick'	t-n-utnu	'beak'
n-tuuni	'to fall'	t-n-uuni	'falling, fall'
n-virna	'to peel'	v-n-irna	'peeling'
n-vukru	'to weed'	v-n-ukru	'act of weeding'

c. infix -i- after stem-initial C (table 1 [c])

3SG		NOM	
n-davra	'to cut'	d-i-avra	'act of cutting, cut'
n-dallu	'to fetter'	d-i-allu	'act of fettering'
n-dèdma	'to smoke'	d-i-èdma	'act of smoking'
n-dena	'to stay (at a place)'	d-i-ena	'act of staying, staying place'
l-lèta	'to have a village'	l-i-èta	'custom, tradition'
l-lèvra	'to disperse s.t.'	l-i-èvra	'dispersal'
l-lòi	'to dance'	l-i-òi	'act of dancing'
l-lòkra	'he swears'	l-i-òkra	'act of swearing'
n-rèi	'to pull'	r-i-èi	'act of pulling'
n-resi	'to win'	r-i-esi	'victory'
n-ròra	'to draw (a line)'	r-i-òra	'line'
n-mai	'to come'	m-i-ai	'arrival'
n-nasu	'to cook'	n-i-asu	'act of cooking'
n-navu	'to sow'	n-i-avu	'act of sowing'

d. prefix i-, ni- before stem-initial vowel (table 1 [d.i,d.ii])

3SG		NOM	
n-atu	'to know'	i-atu, ni-atu	'knowledge'
n-èmnu	'to drink'	i-èmnu, ni-èmnu	'act of drinking, drink, beverage'
n-odi	'to carry'	i-odi, ni-odi	'act of carrying, carrying pole, load'
n-òra	'to be with'	i-òra, ni-òra	'companion'
n-aana,	'to eat'	i-òòna	'act of eating, food' (cf. r-òòna, 3PL)
n-osri	'to hunt'	i-osri, ni-osri	'hunt, hunting'
n-otlu	'to push'	i-otlu, ni-otlu	'push, pushing'

e. zero nominalization (table 1 [e])

3SG		NOM	
n-divri	'to smash'	divri	'smashing'
n-ruru	'to tremble'	ruru	'trembling'
r-nèma	'to fly'	nèma	'flying'
n-ipra	'to slice'	ipra	'slice'
n-uuni	'to spin'	uuni	'spindle'

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f. prefix nia- (table 1 [f])

3SG		NOM	
na-kdiori	'to steal'	nia-kdiori	'stealing'
na-ltieri	'to speak'	nia-ltieri	'act of speaking, speech'
na-mtaatu	'to be afraid'	nia-mtaatu	'act of being afraid, fear'
na-mtiètna	'to sit, be in labor'	nia-mtiètna	'act of sitting, being in labor'
na-mnèsa	'to be equal'	nia-mnèsa	'equality'
na-snurna	'to spin'	nia-snurna	'act of spinning'
na-trima	'to receive'	nia-trima	'receipt'
na-mmali	'to laugh'	nia-mmali	'laughing'
na-keni	'to put, place'	nia-keni	'act of putting, placing'
na-kèrna	'to dry (TR)'	nia-kèrna	'act of drying something'
na-laava	'to walk'	nia-laava	'act of walking, walk'
na-liosri	'to say farewell'	nia-liosri	'farewell party'
na-tuòna	'to ask'	nia-tuòna	'act of asking, question'
na-lòla	'to explain'	nia-lòla	'explanation'
na-vòka	'to gather, assemble'	nia-vòka	'act of assembling, assembly'
na-iapi	'to make'	nia-iapi	'act of making' (cf. iap-ni 'construction')
na-olu	'to sell'	nia-olu	'sale'
na-itra	'to increase'	nia-itra	'increment'

g. prefix i-, infix -i- after stem-initial C (table 1 [g])

3SG		NOM	
na-naaru	'to chew betel'	i-n-i-aaru	'act of chewing betel'
na-natu	'to send'	i-n-i-atu	'act of sending, dispatch'
na-nòa	'to advise'	i-n-i-òa	'act of advising, advice'

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