ÑUMÍ MIXTEC SYLLABLE STRUCTURE AND MORPHOLOGY*

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1 Introduction

Mixtec syllable structure as well as certain aspects of the phonology have been described in a variety of works for various of the Mixtec languages (Alexander 1980, Bradley 1965, Hunter and Pike 1969, North and Shields 1977, Pankratz and Pike 1967, Pike and Cowan 1967, Pike and Ibach 1978, Zylstra 1980). Our treatment of Ñumí Mixtec (NM) syllable structure is brief but crucial to what follows. In the body of this paper we discuss the morphology and segmental morphophonemics of Mixtec in a degree of detail which has never been done before. The most novel aspect of our work below, for Mixtec studies, is that we posit underlying forms for the two tense prefixes and then account for the variety of surface forms. Since in many--indeed, in a majority--of situations the underlying segments are not present in the surface form, the analysis is not immediately obvious.

2 Word structure

A minimal independent word in NM typically consists of two syllables. This seems to be a common feature of Mixtec languages. (See the works cited above.) This is true for both nouns and verbs, as the following examples illustrate.

(1) a. kiti   'animal'
    b. kata   'to sing'[1]

There are a number of clitics, all of which are mono-syllabic, and some adverbs and sentence level functors which have only one syllable. Compounds and loanwords account for all nouns of more than two syllables. Compounding and affixation, discussed below, account for verb forms which are more than two syllables in length.

Verb forms are always morphologically complex in that a verb is always inflected for either the future tense or nonfuture tense[2] (discussed below), although the tense prefixes do not always appear overtly (except by tone sandhi). The tense prefixes appear overtly in the following form:

(2) a. xi + to   'to take care of', NFUT
    b. k^W + iso   'to carry', FUT

Clitics may precede and follow these forms, as in the following example:

(3)   [ni]   [ka]   [xi +   či]   [ni]
    ASPECT   NUMBER TENSE +   ROOT   PERSON
    completive plural NFUT + 'bathe'   2 pl
    'you (pl.) bathed'

The verb word itself may be lengthened by the addition of the repetitive morpheme /^{n}da-/. According to the analysis which we present below, verbs with this morpheme always have the following structure, although there will be no overt segmental realization of the tense morpheme at the beginning of the word. We give the proposed underlying form (UF) as well as the surface form (SF).

(4) a. ## [TENSE + REPETITIVE # [FUTURE + ROOT] #] #
          V   V   V   V

    b. UF: ##k^W-^{n}da#k^W-ate##
        SF: ^{n}dakate   'to wash'

    c. UF: ##xi-^{n}da#k^W-či?i##
        SF: ^{n}dači?i   'to replant'

Primary word stress always falls on the penultimate syllable of the word in NM. In the following formalization of this generalization, X^0 is understood to vary over all word-level syntactic category labels.

(5)   Stress Assignment: V ---> [+ stress] / ___(C_0)V]$_X^0$

One phonetic process refers crucially in its environment to the word boundary. A glottal stop is inserted before a word-initial vowel, even when the word occurs in the middle of an utterance. This is shown in (7).

(6)   Glottal Insertion: $\emptyset$ --> ? / # ___ V

(7)   [?]a [?]oo ^{n}deyu   [?asíí]
          Q   NFUT-to=be food   tasty
        'Is there tasty food?'

The glottal stop is inserted in compound words such as **tɨ#[?]ina** 'dog' and **^{n}dɨ#[?]iši** 'spider'. The structure of these words is discussed below.

3 Phonemes

3.1 Consonants

The following consonant phonemes occur in native words in NM, although those in parentheses occur only rarely and we do not discuss them further.[3]

(8)

		t		k	k^W
		^{n}d			
	v	(d)	ǯ	x	
		s	š		
	m	n			
		l			
		(ɬ)			
	w		y		

These symbols have their normal phonetic values except that /v/ represents a voiced bilabial fricative and /d/ is a voiced interdental fricative.

Two phonemes have notable allophones (although not atypical for Mixtec). /t/ is released nasally before a nasalized vowel or glide.

(9) a. /tuni/   [t^{n}ũnî]   'mole, spot'
    b. /tu?ũ/   [t^{n}ũ?ũ]   'word'
    c. /tyuũ/   [t^{n}ỹũũ]   'task'

The phoneme /y/ is always realized as a nasalized glide before a nasalized vowel as in (9c) above and in **iyũ** [îỹũ] 'six'. Otherwise, syllable-initially /y/ is pronounced as a voiced alveopalatal fricative: **yu?u** [žu?u] 'to be afraid'.

In the remaining environment, which is following a consonant and preceding an oral vowel, /y/ is [y]: **syu?u** [syu?u] 'to frighten'.[4]

The phoneme /^{n}d/ exhibits free fluctuation between [^{n}d] and [t] in the environment following /š/, as in **š^{n}da?u** [š^{n}da?u] ~ [šta?u] 'to cheat'.

3.2 Vowels

The vowel phonemes are /i, e, a, o, u/. These vowels occur contrastively both checked (V?) and nasalized. A vowel may also be nasalized and checked. Checked vowels occur only in the stressed syllable.

(10) a. ^{n}de?.yu   'mud'   d. i.ni   'inside'
        b. ^{n}de.yu   'food'   e. yu?.ma 'smoke'
        c. i?.ni   'heat'   f. yu.ma   'wax'

Nasalized vowels, with very few exceptions,[5] occur underlyingly only in the final syllable of the word. Within the word, vowels and glides before a nasalized vowel or glide or a nasal consonant are nasalized phonetically. Nasalization spreads regressively within the word until stopped by an obstruent. A vowel **following** a nasal consonant is also slightly nasalized. We differentiate in the following chart between glides (G), nasals (N), and other consonants (C):

(11)

CV?Ṽ	ka?ã	[ká?ã]	'to say'
CVCṼ	saxí	[saxĩ]	'nephew'
VGṼ	iyũ	[ĩỹũ]	'six'
CVṼ	kuũ	[kũũ]	'four'
CGVṼ	tyuũ	[t^{n}ỹũũ]	'task'
CGV?Ṽ	čyuũ	[čỹũũ]	'chicken'
GVGṼ	yuyũ	[ỹũỹũ]	'bee colony'
GVṼ	yu?ũ	[ỹũ?ũ]	'land'
GVNV	yunu	[ỹũnũ]	'string bag'
NVV	nuu	[nũ]	'face'
NVGV	niyi	[nĩỹĩ]	'blood'
NV?V	mi?i	[mĩ?ĩ]	'garbage'
NV?GV	ma?yu	[mã?ỹũ]	'in the middle of'
NVNV	nama	[nãmã]	'soap'
GV?NV	ya?mi	[ỹã?mĩ]	'sweet potato'
CV?NV	ta?nu	[t^{n}ã?nũ]	'bent'
CVNV	kana	[kãnã]	'to shout'
NV?V	ni?i	[nĩ?ĩ]	'to find'
NVCV	(not found)		

Nasal spreading does not cross word boundaries as the

following examples involving compounding illustrate:

(12) a. ke#ne?e   [ke#né?ế]   'get, obtain'
     b. sa#yií   [sa#ŷíí]   'corncob'
     c. yû#yivi   [ŷû#ž̌ivi]   'everyone'
     d. tû#yuxa   [tⁿû#ž̌uxa]   'pine tree'

The phoneme /ⁿd/ does not condition allophones, as the nasal phonemes /m/ and /n/ do. This is one of the reasons for treating /ⁿd/ as a non-nasal phoneme. Contrast the following examples, where /ⁿd/ acts as a non-nasal[6]:

(13) a. xa?ⁿde [xa?ⁿde] 'to cut'
     b. xa?nu [xấ?nû]   'to grow'

(14) a. te?ⁿde [te?ⁿde] 'to complete'
            (not *[tⁿế?ⁿde])
     b. ta?nu [tⁿấ?nû]   'bent'

(15)   ya?mí [ŷấ?mí]   'sweet potato'

4 Syllable structure

4.1 Onsets

Syllables without onsets occur in either syllable of the word although they are much more common in the second syllable of a word than syllables with onsets. Syllables without onsets are less commonly found in the first syllable.

(16) a. o.o   'to be'
     b. ko.o   'to be (FUT)'
     c. ko?.o   'bowl'
     d. u?.u   'to be in pain'

In fact, NM seems to exhibit a real preference for the second syllable of a word to be simply a vowel, often identical to the vowel in the stressed syllable.

Any consonant, including the glides /y/ and /w/ may occur as a one-segment onset, though the lateral /l/ and the labial consonants /m, v, w/ are not common.

(17)   Word-initial   Word-medial

     a. vixí   'cold'   savi   'rain'
     b. čaka   'fish'   suči   'child'
     c. kimi   'star'   xika   'to walk'
     d. kʷita   'to be tired' šikʷi   'milk'

e.	lasu	'braid'	vilu	'cat'
f.	minu	'an herb'	kimi	'star'
g.	nune	'to have time'	xani	'to plow'
h.	^{n}dawa	'to fly'	xa?^{n}de	'to cut'
i.	savi	'rain'	kisí	'to sleep'
j.	šini	'head'	kaše	'to sneeze'
k.	taka	'nest'	ita	'flower'
l.	wa?a	'well'	^{n}dawa	'to fly'
m.	xinu	'to run'	saxí	'nephew'
n.	yata	'back'	kayu	'to get burned'

Two-segment onsets occur only in the stressed syllable of the word. There are two types of branching onsets. The first consists of a consonant followed by a glide. The following consonants are the only ones which have not been found before a glide: the lateral /l/ and the labial consonants /k^W, v, m, w/.

(18)   /Cy/   /Cw/

a.	tyu#šini	'small star'	twa?a	'smart'
b.	kyuu	'day'		
c.	^{n}dya?a	'to see'	^{n}dwa?a	'canyon'
d.	čyuɓ	'chicken'		
e.	xyoo	'griddle'		
f.	sya?a	'to pass'	swa?a	'thus'
g.	šya?ấ	'a bird'		
h.			nwaa	'why?'
i.			ywa?a	'snow'

We treat /k^W/ as a single segment, rather than a consonant plus a glide, even though it would fit into the pattern shown above. One reason for this is that, although glides occur with many consonant phonemes, there are only a few examples of each. On the contrary, /k^W/ is very common in all types of words.

Another reason for treating both /k^W/ and /^{n}d/ as units in the syllable structure rather than as sequences is that they both can occur in the onset position of the second syllable of a word. Branching onsets do not occur in such syllables.

(19) a. šik^{W}i   'milk'
     b. ^{n}dak^{W}i   'strong'
     c. ko^{n}do   'knee'
     d. še^{n}du   'navel'

The second type of branching onset in uninflected words is a strident fricative (/š/ or /s/) followed by a stop:

s^ndikí 'cattle'. It is not very common in monomorphemic words, but such onsets are common as a result of the affixation of the causative morpheme /s-/ and its allomorph /š-/. Branching onsets with /s/ or /š/ include the clusters /s^nd/ and /sk^w/. Our analysis of /^{n}d/ and /k^w/ as units permits these clusters.[7]

Given that most words have only two syllables and that branching onsets occur only in the first syllable, the following patterns are the only possibilities and they are all attested:

(20)   V.V   oo   'to be'
        V.CV   ita   'flower'
        CV.V   kee   'to come'
        CV.CV   kaku   'to be born'
        CCV.V   kyuu   'day'
        CCV.CV   syawa   'to irrigate'

Thus the simple word in NM may be described by the following formula:

(21)   (C)(C)V.(C)V

The pattern CV.CV is by far the most common, and CCV.CV is quite rare.

4.2 Rhymes

All rhymes in Mixtec consist of a single vowel. Any of the vowels may occur in both stressed and unstressed syllables, although /o/ and especially /ó/ do not occur as fre-quently as other vowels.[8] As already stated, checked vowels occur underlyingly only in the stressed syllable,[9] and nasalized vowels only in the final syllable underlyingly.

5 Verb morphology

The majority of NM verbs only occur in two tenses, which we refer to here as the future and the nonfuture. In this section we account for the allomorphy of these prefixes. We assume the strongest hypothesis, namely, that each prefix has primarily one underlying form. There may be some genuine suppletive allomorphy, as we mention below. Allomorphy is shown to be dependent largely upon (a) the number of syllables in the verb stem, and (b) the type of initial segment of the stem--vowel, nasal consonant, or oral consonant.

The paradigm in Table 1 gives two examples from each pattern group, as well as a count of the number of verbs which illustrate that pattern from a random corpus of 200 verbs. Morpheme breaks are indicated. (In the case where an epenthetic vowel is involved, the break is indicated before this vowel.)

We posit the underlying form /k^W-/ for the future morpheme for all verbs, with the exception of a single verb which has the allomorph /č-/: či?i '(the wind) will begin to blow'. We do not discuss this allomorph further. The nonfuture morpheme is usually /xi-/, but it has the (presumably) suppletive allomorph /y-/ for a small arbitrary class of verbs. We also do not discuss these allomorphs further. A relatively small number of rules is necessary to account for the allomorphy that is exhibited by the forms in Table 1.

5.1 Nonfuture tense prefix

We begin by looking at the nonfuture morpheme /xi-/. The vowel is deleted before any polysyllabic root, whether they are consonant-initial or vowel-initial. (All vowel-initial roots are polysyllabic.)

(22)   /i/-Deletion: $i \longrightarrow \emptyset \ / \ \underline{\quad} + C_0 \ V \ C_0 \ V$

Thus underlying /xi-asi/ becomes **xasi** 'to close' by /i/-Deletion. The derivation of **saka** 'to knead' (NF) from underlying /xi-saka/ involves /i/-Deletion and also the loss of the /x/. A rule such as Consonant Deletion could be stated to account for this loss.

(23)   Consonant Deletion: $\begin{array}{c} C \\ \text{[-cor]} \end{array} \longrightarrow \emptyset \ / \ \underline{\quad} + C$

However, this rule would duplicate unnecessarily the constraints already stated with respect to syllable structure. We assume, following Harris 1983, that segments which cannot be incorporated into the syllable structure by the end of the derivation undergo the Erasure Convention, which is given below.

TABLE 1: Sample Verbs

(Grouping refers to first segment of root.)

Future		Nonfuture	# in Corpus of 200 Verbs
(Multisyllabic, oral consonant)			136
kani?nu	'to visit'	kani?nu	
^{n}dakate	'to wash'	^{n}dakate	
(Multisyllabic, nasal consonant)			17
ko-nee	'to carry'	nee	
ko-nini	'to hear'	nini	
(Monosyllabic, oral consonant)			11
k-aka	'to walk'	xi-ka	
k-oto	'to take care of'	xi-to	
(Monosyllabic, nasal consonant)			4
ku-ni	'to know'	xi-ni	
ku-nu	'to run'	xi-nu	
(Vowel, Class I)			19
k-asi	'to close'	x-asi	
k-uya?á	'to give'	x-uya?á	
(Vowel, Class II)			8
k^W-aá	'to buy'	x-aá	
k^W-iso	'to carry'	x-iso	
(Vowel, Class III)			5
k-uni	'to embrace'	y-uni	
č-i?i	'to begin (wind)'	y-i?i	

(24)   Erasure Convention: Segments not incorporated
         into syllable structure at the end of a derivation
         are erased (Harris 1983:35).

(Certain assumptions have to be made so that this convention
will delete the correct segment; see Harris 1983.) Thus the
Consonant Deletion rule is superfluous. We note, however,
that the Erasure Convention must apply in such a way that
underlying /k^w-s#k^w-^{n}da?u/ (F-CAUS#F-to be poor) surfaces as
s^{n}da?u and not as **^{n}da?u**. That is, although the underlying
/s/ cannot be syllabified when the following /k^w/ is
present, the erasure of the /k^w/ allows the /s/ to form an
onset with /^{n}d/.

        Thus underlying /xi-saka/ becomes intermediate /x-saka/
by /i/-Deletion and surface **saka** by the Erasure Convention.
Because most roots are polysyllabic and consonant-initial,
in most cases /xi-/ does not appear overtly in the word.
Although the analysis of tone is incomplete, the facts seem
to provide further evidence for this derivation. Briefly,
/xi-/ carries a high tone which is not lost when the prefix
is deleted, but is associated in such instances with the
following syllable.

5.2 Future tense prefix

        Since most Mixtec verb roots begin with an oral conso-
nant, underlying /k^w-/ usually is deleted by the Erasure
Convention. Thus underlying /k^w-saka/ becomes surface **saka**
'to knead' (future). This erasure is prevented from
applying in the case of most nasal-initial roots by the
following rule which vocalizes the labialization before
nasals:

(25)   Vocalization: k^w --> ku / ___ C
                                        [+nasal]

        Thus underlying /k^w-ni/ becomes **kuni** 'to embrace' by
the Vocalization rule, and the Erasure Convention cannot
apply. The phoneme /^{n}d/ usually functions as a non-nasal
consonant with respect to this rule. Thus underlying
/k^w-^{n}do?o/ becomes surface **^{n}do?o** 'to happen'. If this
prefix /ku/ occurs in the antepenultimate syllable, as it
does in the case of multisyllabic nasal roots, the /u/
lowers to /o/ by the following rule:

(26)   Lowering: u --> o / ___ + $ $

        Thus   underlying   /k^w-nini/   becomes   intermediate
/ku-nini/ by the Vocalization rule and surface trisyllabic

konini 'to hear' by the Lowering rule. The /u/ of **kuya?á** 'to give' presumably does not lower since it is part of the multisyllabic (assumed to be compound) root /uya?á/.

Before other consonant-initial roots, and most vowel-initial roots, the labialization of /k^W/ is lost. This is described by the following rule:

(27)   Delabialization: $k^W \longrightarrow k$ / ___ +

Thus underlying /k^W-asi/ becomes **kasi** 'to close'. A group of vowel-initial roots (Class II in Table 1) must be marked as exceptions to Delabialization.

The Erasure Convention is prevented from applying in the case of monosyllabic oral consonant roots by the application of the following rule which inserts a vowel identical to the root vowel before the root:

(28)   Vowel Epenthesis: $\emptyset \longrightarrow V_i$ / C ___ [C V_i

Thus underlying /k^W-ka/ becomes surface **kaka** 'to walk' with Delabialization applying either before or after Vowel Epenthesis.

There are verbs which must be marked as exceptional in one way or another. For example, there are two nasal consonant initial roots, /ni?i/ 'to find' and /no?o/ 'to go home', which must be marked [-Vocalization]. They pattern like oral consonant roots rather than as nasal consonant roots. Thus underlying /k^W-ni?i/ and /xi-ni?i/ have the identical surface form **ni?i**, rather than *koni?i and ni?i, and underlying /k^W-no?o/ and /xi-no?o/ both surface as **no?o**.

There are a few oral consonant roots, including a small minority of /^{n}d/-initial roots, that pattern like nasal consonant roots. These roots must be marked as positive exceptions to Vocalization in that the rule applies although the consonant is not nasal.

(29) a.   koteku   'to be alive'
     b.   kokuu   'to be'
     c.   kosiki   'to play'
     d.   kotuu   'to lay down'
     e.   koku?u   'to become sick'
     f.   ko^{n}detu   'to wait'
     g.   ko^{n}dee   'to begin'
     h.   ko^{n}dikí   'to follow'
     i.   ko^{n}dita   'to owe'

    j. koⁿdya?a   'to see'
    k. koⁿdeka   'to take'

A few even more irregular verbs remain. These are listed in Table 2 with tentative morpheme breaks, since they appear to exhibit two more (suppletive) allomorphs for the nonfuture morpheme: /ka-/ and /ki-/. The major irregularities are found in the nonfuture form.

TABLE 2: Irregular Verbs

Future		Nonfuture
k-o?o	'to drink'	x-i?i
k-oo	'to be'	oo
ku-sǘ	'to sleep'	ki-šǐ
ko-siki	'to play'	ka-siki
ko-tuu	'to lay down'	ka-tuu
kʷ-iso	'to carry'	x-iso
ku-te?é	'to get dirty'	ka-te?é

The rule orderings for the rules discussed above are given below:

(30)   Vocalization --
             feeds Lowering, bleeds Vowel Epenthesis and
             Delabialization
          Vowel Epenthesis
          Stress Assignment
          /i/-Deletion
          Lowering
          Delabialization

5.3 Other prefixes

Other prefixes which must be discussed in the morphology of the verb are the repetitive morpheme /ⁿda-/ and the causative morpheme /s-/. The causative morpheme /s-/ has an allomorph /š-/ which occurs before non-velar consonantal consonants.

(31)   Palatalization: s --> š / ___ +   C
                                           [+cons]
                                           [-back]

(32) a.   skaka   'to drive'
     b.   skʷiso   'to carry'
     c.   syu?u   'to frighten'

d.	š^{n}da?u	'to cheat'
e.	šǰyo?o	'to cook'
f.	štee	'to plant'

Palatalization applies **after** the Erasure Convention deletes unincorporated segments since underlyingly neither /nda-/ nor /s-/ occur directly affixed to a root; the root must be preceded by the future tense prefix, as shown in the following formula:

$$(33) \qquad [\text{TENSE} + \begin{Bmatrix} \text{REP} \\ \text{CAUS} \end{Bmatrix} [\text{FUT} + \text{V}]]$$

However, due to the morphophonemic rules shown above, this is not always obvious. Derived verb stems with /^{n}da-/ pattern like oral-initial roots in the same way as do non-derived /^{n}d/-initial roots. The derivations of some verb forms with /^{n}da-/ and /s-/ are given below, showing the various rules operating. (The capital letters indicate stressed vowels.)

(34)

	NF-REP-F-to know	F-REP-F-to see
UF	/xi-^{n}da#k^w-ni/	/k^w-^{n}da#k^w-^{n}dya?a/*
Voc	xi-^{n}da-ku-ni	k^w-^{n}da-ku-^{n}dya?a
Epen		
Str	xi-^{n}da-kU-ni	k^w-^{n}da-ku-^{n}dyA?a
i-Del	x-^{n}da-kU-ni	
Low		k^w-^{n}da-ko-^{n}dyA?a
Delab		k-^{n}da-ko-^{n}dyA?a
Eras	^{n}da-kU-ni	^{n}da-ko-^{n}dyA?a
Palat		
SF	^{n}dakUni	^{n}dako^{n}dyA?a
	'to recognize'	'to review'

*Positive exception to Vocalization

	F-CAUS-F-to be poor	F-REP-F-to do
UF	/#k^w-a?^{n}di/	/k^w-^{n}da#k^w-sa?a/
Voc		
Epen		
Str	k^w-s-k^w-^{n}dA?u	k^w-^{n}da-k^w-sA?a
i-Del		
Low		
Delab	k-s-k-^{n}dA?u	k-^{n}da-k-sA?a
Eras	s-^{n}dA?u	^{n}da-sA?a
Palat	š-ndA?u	
SF	š^{n}dA?u	^{n}dasA?a
	'to cheat'	'to fix'
	NF-CAUS-F-to walk	F-CAUS-F-to kill

UF	/xi-s#k^w-ka/	/k^w-s#k^w-^{n}da?u/
Voc		_____
Epen	x̄ī-s̄-k̄^{w}-āka	
Str	xi-s-k^w-Aka	$\overline{k^w\text{-s-}k^w\text{-A?}^n\text{di}}$
i-Del	x-s-k^w-Aka	
Low		_____
Delab	$\overline{\text{x-s-k-Aka}}$	$\overline{\text{k-s-k-A?}^n\text{di}}$
Eras	s-k-Aka	s-k-A?^{n}di
Palat		
SF	$\overline{\text{skAka}}$	$\overline{\text{skA?}^n\text{di}}$
	'to drive'	'to explode'

	NF-REP-F-CAUS-F-to carry	F-REP-F-CAUS-F-to put
UF	/xi-^{n}da#k^w-s#k^w-iso/	/k^w-^{n}da#k^w-s#k^w-tee/
Voc	_____	_____
Epen		
Str	$\overline{\text{xi-}^n\text{da-k}^w\text{-s-k}^w\text{-Iso}}$	$\overline{k^w\text{-}^n\text{da-k}^w\text{-s-k}^w\text{-tEe}}$
i-Del	x-^{n}da-k^w-s-k^w-Iso	
Low		_____
Delab	$\overline{\text{x-}^n\text{da-k-s-k}^w\text{-Iso}}$	$\overline{\text{k-}^n\text{da-k-s-k-tEe}}$
Eras	^{n}da-s-k^w-Iso	^{n}da-s-tEe
Palat		^{n}da-š-tEe
SF	$\overline{^n\text{dask}^w\text{Iso}}$	^{n}daštEe
	'to load (a gun)'	'to transplant'

6   Compound words

Some compound words in NM involve the juxtaposition of two lexical morphemes. If the first of these morphemes has a second syllable consisting of only a vowel, that vowel is usually dropped. We refer to the resulting form as the truncated stem. The truncated word loses its stress; penultimate word stress in the compound is maintained. Checking is lost in a truncated stem since only a stressed syllable may be checked.

(35)   Truncation: V ---> ∅ / V ___ # $ $

(36) ve?e 'house' + kaa   'metal' => ve#kaa 'jail'
     kuu 'to be' + twa?a 'smart' => ku#twa?a
                                                'to learn'
     taa 'to give' + nuu   'awhile' => ta#nuu 'to lend'
     kaa 'to eat' + šini 'evening' => ka#šini
                                             'to eat supper'

As when the repetitive and causative prefixes are added, the non-truncated, second verb of a compound must be in the future form.

(37)   kii 'to come' (F) + koto 'to visit' (F) =>
           ki#koto 'to come to visit' (F)

      kii 'to come' (F) + ko^{n}dya?a 'to see' (F) =>
           ki#ko^{n}dya?a 'to come to see' (F)

      xiɨ 'with' + ki?ɨ 'to go' (F) =>
           xɨ#ki?ɨ 'to take' (NFUT)

It should be noted that in the last example the loss of the final vowel in the truncated form does **not** include the loss of nasalization, which may be evidence supporting an autosegmental analysis of nasalization in Mixtec.

Adjectives and adverbs may be emphasized through reduplication of the first syllable of the word, forming a type of compound.

(38) ^{n}di?i   'blue' ^{n}di#^{n}di?i   'very blue'
        k^{w}ii   'green'   k^{w}i#k^{w}ii   'very green'
        k^{w}e?e   'bad'   k^{w}e#k^{w}e?e   'very bad'

Another type of compound word is formed by combining an irregularly shortened form of a classifying noun with another noun.

(39)

na- (nana 'mother') + šiso 'in-law'	'mother-in-law'	
ndi-(kiti 'animal') + xako	'opossum'	
ta- (tata 'father') + šiso 'in-law'	'father-in-law'	
te- (tee 'man') + tyuũ 'task'	'authority'	
te- (^{n}dute 'water') + ya?a 'hot pepper'	'hot pepper sauce'	
ti- (kiti 'animal') + nana	'tomato'	
tũ- (yutũ 'tree') + yuxa 'resin'	'pine tree'	
yá- (ya?á 'woman') + si?i 'female'	'wife'	

7 Motion verbs

A small class of motion verbs exists which occurs with the plural word **k^{w}ei**, rather than the preposed plural clitic **ka**. This plural marker **k^{w}ei** has the penultimate stress pattern of a normal word. The plural form of these motion verbs resembles a compound word, formed by applying the Truncation rule above.

(40)   singular   plural

	singular	plural
'to return'	kii	ki#k^{w}ei
'to go home'	no?o	no#k^{w}ei
'to arrive'	^{n}daxaa	^{n}daxa#k^{w}ei
'to get up'	^{n}dota	^{n}dota#k^{w}ei
'to enter'	kivi	kivi#k^{w}ei

A few verbs deviate from this pattern of plural-forming, and are irregular in other ways as well.

(41)   'to lay down'   'to look like'   'to go'

		'to lay down'	'to look like'	'to go'
FUTURE	sing.	kotuu		ki?í
	pl.	kondwei		xíkwei
NONFUT.	sing.	katuu	kaa	kwa?a
	pl.	kandwei	kanda	kwákwei
PAST	sing.	katuu		xa?ã́
	pl.	kandwei		xákwei

8 Clitics

When vowel-initial bound pronouns (namely, /-i/ '3rd person, child' and /-o/ '1st person inclusive') occur after a verb or noun, the following rule applies:

(42)   Elision: V ---> ∅ / V(?) ___]X$_0$ V

Although the final vowel is elided, the nasalization feature of this vowel remains and is reassociated with the clitic vowel. Therefore either nasalization must spread before Elision applies or this feature must be treated autosegmentally.

(43)   word   word + /-i/   word + /-o/

word		word + /-i/	word + /-o/
ta?a	'relative'	ta?#i	ta?#o
staa	'tortilla'	sta#i	sta#o
sa?a	'to do, make'	sa?#i	sa?#o
nee	'to carry'	ne#i	ne#o
no?o	'to go home'	no?#i	no?#o
ki?í	'to go'	ki?#í	ki?#ő

The two clitics /-i/ and /-o/ may be added to the same word, yielding a string of three vowels.

(44)   ka skuči#o#i
         pl bathe-1incl-3,child
         'we are bathing him'

    Words ending in CV syllables do not undergo Elision but rather the following rule:

(45)   Degemination: $V_i] X_0 V_i \longrightarrow V_i$

This is illustrated by the following forms which are underlined in the following paradigm:

(46)   word   word + /-i/   word + /-o/

    ^{n}datatu 'to rest' ^{n}datatu#i ^{n}datatu#o
    yiki   'bone'   **yiki**   yiki#o
    kutoo   'to like'   kuto#i   **kutoo**

    Some words ending V?V must be marked as exceptions to Elision (but not to Degemination).

(47)   word   word + /-i/   word + /-o/

    ^{n}diši?u 'goat' ^{n}diši?u#i ^{n}diši?u#o
    či?i   'to plant'   či?#i   či?i#o
    xaše?í   'to eat'   xaše?#í   xaše?í#ó
    ti^{n}do?o 'pitcher'   ti^{n}do?o#i   ti^{n}do?o
    ta?i   'squash plant'   ta?#i   ta?i#o

    Deictic particles **yuú** 'there' and **ya?a** 'here' have abbreviated clitic forms **-ú** and **-a** which may be appended to nouns. The same rules of Elision and Degemination as for other clitics apply.

(48)   tee   'man'   +   -ú   =>   te#ú
         kiti   'animal' +   -ú   =>   kiti#ú
         kiti   'animal' +   -a   =>   kiti#a

Notes

* Ñumí Mixtec is spoken in the municipality of San Juan Ñumí and surrounding towns in the district of Tlaxiaco, Oaxaca, Mexico. The data are from San Antonio Nduaxico Ñumí, a town about one mile from San Juan. Gittlen, under the auspices of the Summer Institute of Linguistics, did field work there from March to September of 1982 and has continued her studies on the language since that time.

1. Glosses of verbs are in the infinitive although there is no infinitive form in Mixtec. Verbs will be marked FUT (future) or NFUT (nonfuture) when the segmental representation clearly indicates one or the other.

2. A few irregular nasal consonant-initial verb roots have more forms, as shown by the following verb **nini** 'to hear'.

Future tense

	incompletive	potential
sing.	ko konini	konini
plural	vi ko konini	vi konini

Nonfuture tense

	continuative	completive	habitual
sing.	nini	ni xonini	ni xo xonini
plural	ka nini	ni ka xonini	ni ka xo xonini

The incompletive aspect marker **ko** (apparently derived from **koo** 'to be' (FUT)) and the habitual aspect marker **xo** can occur with any verb. The prefix /ko-/ is an allomorph of the future tense prefix /k^w-/, as derived by the rules given below. The prefix /xo-/ may be a remnant of a more regular nonfuture form of the verb 'to be' than is now used in the language.

3. Specifically, these rare phonemes occur only in the following morphemes: /d/ in the bound third person pronouns -**de** 'male adult' and -**de** 'liquid'; /ɾ/ in the related independent and bound pronouns ɾu?ú and -ɾí '1st person, addressing a child', and ɾo?ó and -ɾó '2nd person child'.

In this discussion of Mixtec phonology we purposefully ignore consonants which occur only in Spanish loan words, such as the bilabial fricative.

4. We have found three exceptions to this allophonic rule: **yuś** [žúú] 'there, that'; **yo?ó** [žó?ó] 'full form of first person inclusive pronoun' pers incl pronoun' **yaa** [yaa] ～ [žaa] and its clitic form **-ya** [-ya] ～ [-ža] 'spirit, saint, god', which exhibit free fluctuation.

5. The following are the only words known to have unpredictably nasalized vowels in the stressed syllable:

^{n}dóta	'to stand up'
^{n}dóta	'to resist'
^{n}dóso	'to fall down'
kéta	'to reach, to arrive'
káta	'to jump'
ti#číki	'wrinkled'
ti#xíxa	'hornet'

6. Although Feinstein 1979 has argued that prenasalized consonants should be treated universally as consonant clusters, our data support the opposite viewpoint. In NM /^{n}d/ does not pattern as a nasal + obstruent within words (nor, as will be seen, in the morphology), which would seem to be problematic for this analysis.

7. Glottal stop is not a consonant in our analysis and therefore does not fill an onset slot in words like [wa.?a] 'well', [?oo] 'to be', and [xa.?^{n}de] 'to cut'. In the last example, the analysis of the glottal as a syllable-initial consonant would require a new type of consonant cluster, and would have to be permitted in unstressed syllables as well.

8. Spanish loan words ending in /o/ are almost invariably altered to end in /u/.

k^{w}étu	'story'	(Sp. **cuento** /kwento/)
sapatu	'shoe'	(Sp. **zapato** /sapato/)

9. Alternatively, it might be claimed (as previous Mixtec analyses have) that glottal stop is a phoneme which is extremely restricted. It would occur in NM only as the optional right member of a branching rhyme in a stressed syllable.

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