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THE COMPLETIVE AND POTENTIAL FORM OF CHICHICAPAN ZAPOTEC VERBS¹

Joseph P. Benton

- 0. Introduction
- 1.0 A suppletive analysis
- 2.0 Nonsuppletive analyses
- 2.1 Completive aspect
- 2.2 Potential aspect
- 3.0 Conclusions and summary

0. Introduction

The phonological changes associated with the potential and completive aspects in Zapotecan languages have been traditionally analyzed suppletively (Butler 1980, Pickett 1960).² In this paper I examine suppletive and nonsuppletive analyses of the potential and completive aspects of Chichicapan Zapotec, hereafter ChZ. I show that a nonsuppletive analysis of the facts of ChZ is more insightful than a suppletive one.

1.0 A suppletive analysis

In this section I outline a suppletive analysis for the completive and potential aspects of ChZ and point out the problems associated with it. The completive aspect has three allomorphs; *bi-*, *gu-*, and *b-*.³ *bi-* occurs exclusively before a morphologically marked class of verb roots in ChZ, as in the examples below:

<u>Root</u>		<u>Completive</u>
1a. -gaaʔi	<i>be buried</i>	bi-gaaʔi
b. -daabi	<i>be rubbed</i>	bi-daabi
c. -ʃibiʃi	<i>be afraid</i>	bi-ʃibiʃi
d. -zizi	<i>be rung</i>	bi-zizi
e. -ro:ʔ	<i>be grown</i>	bi-ro:ʔ

gu- occurs elsewhere before consonant-initial roots, *a-* initial roots which subsequently lose the *a* if a consonant follows, and a morphologically marked class of *y-* initial roots.

Examples of roots which take *gu-* are given below:

<u>Root</u>		<u>Completive</u>
2a. -di:ʔji	<i>cross over</i>	gu-di:ʔji
b. -jiibi	<i>wash</i>	gu-jiibi
c. -robá	<i>sprinkle</i>	gu-robá
d. -aza	<i>bathe</i>	gu-za
e. -aldá	<i>fit</i>	gu-ldá
f. -a:ʔ ⁴	<i>drink</i>	gu-a:ʔ
g. -ya	<i>ripen</i>	gu-ya
h. -yu:ʔ	<i>enter</i>	gu-yu:ʔ

b- occurs before all other vowel and *y-* initial roots, as well as before vowel prefixes:

<u>Root</u>		<u>Completive</u>
3a. -inn	<i>sense</i>	b-inn
b. -uʔá	<i>see</i>	b-uʔá
c. -yooba	<i>be swept</i>	b-yooba
d. -yayí	<i>rotate</i>	b-yayí
<u>Root plus causative prefix</u>		<u>Completive</u>
4a. -a-těsa	<i>raise</i>	b-a-těsa
b. -a-k ^w izi	<i>dry out</i>	b-a-k ^w izi

The following spell-out rule summarizes the above facts:

Completive Aspect Spell-Out

Completive ==> bi/_ [class bi]
 gu/ { [+cns]
 { [a]
 { [class Y]
 b

The *a-* deletion rule mentioned above has the following form:

a- Deletion⁵

a → ∅/u_C

So far the analysis proposed appears to be straight forward. I turn now to the potential aspect. The potential aspect has five surface allomorphs in ChZ; ∅-, gí-, č-, ě-, and g-. The ∅- allomorph occurs with a morphologically marked class of verb roots beginning with lenis obstruents, r and l. Lenis obstruent-initial roots other than those beginning with b or b^w undergo fortition of the initial consonant:⁶

<u>Root</u>		<u>Potential</u>
5a. -duša	<i>bark</i>	túša
b. -ĵiibi	<i>wash</i>	čííbi
c. -za	<i>walk</i>	sá

Notice that the first vowel of the root undergoes a low to high tone change in the potential. b, b^w-, r-, and l- initial roots undergo a change in place and/or manner in addition to fortition if they take the ∅- or zero allomorph of the potential. As with those examples in (5), there is a low to high tone change, except in the case of (6b), where a following high tone lowers the expected high tone:

<u>Root</u>		<u>Potential</u>
6a. -bači	<i>place</i>	k ^w áči
b. -robá	<i>sprinkle</i>	č ^y obá
c. -la [?]	<i>loose</i>	tá [?]

gí- occurs on all other consonant-initial roots, excluding those beginning with y :

<u>Root</u>		<u>Potential</u>
7a. -těsa	<i>raise</i>	gí-těsa
b. -ňi [?]	<i>speak</i>	gí-ňi [?]

č- occurs on a morphologically marked class of y- initial roots:

<u>Root</u>		<u>Potential</u>
8a. -yu: [?]	<i>enter</i>	č-ů
b. -yása	<i>arise</i>	č-yěsa

Note that in the above examples a root beginning with *y* or a consonant and containing a long checked vowel changes to a rising tone and no checking in the potential, while a root that already has a non-low tone will not change in tone. \check{y} - occurs elsewhere with roots either beginning with *i* or *y*:

<u>Root</u>		<u>Potential</u>
9a. - \check{y} inn	<i>sense</i>	\check{y} - \check{y} inn
b. -yela	<i>belch</i>	\check{y} -yéla

Note that roots taking \check{y} - which have low tones undergo a low to high change in the first vowel of the root, as do those taking \check{c} -. *g*- occurs elsewhere with either vowel-initial roots or roots with vowel prefixes:

<u>Root</u>		<u>Potential</u>
10a. -aza	<i>bathe</i>	<i>g</i> -áza
b. -u:ʔ \check{y} i	<i>rot</i>	<i>g</i> -ú:ʔ \check{y} i
<u>Root plus Causative prefix</u>		<u>Potential</u>
11a. -u-těsa	<i>raise</i>	<i>g</i> -ú-těsa
b. -u-k ^w izi	<i>dry out</i>	<i>g</i> -ú-k ^w izi

As with those verb roots which take \check{c} - and \check{y} -, verb roots or prefixes which take *g*- undergo a low to high tone change if they have a low tone.

The following rules generate the correct potential aspect allomorphs. A disjunctively-ordered spell-out rule specifies the form of the potential aspect allomorph:

Potential Aspect Spell-Out

POTENTIAL ==> \emptyset /_ [POTENTIAL mutation class]

g í/_ [+cns]

\check{c} /_ [class \check{c}]

\check{y} /_ $\left[\begin{array}{l} -cns \\ -back \\ +front \\ +high \end{array} \right]$

g

A stem formation rule specifies the initial consonant changes for those roots which take the zero allomorph:

$$\left. \begin{array}{l} \left[\begin{array}{c} b/b^w \\ r \\ l \end{array} \right] \rightarrow \left[\begin{array}{c} k^w \\ \tilde{c}y \\ t \end{array} \right] \\ c \rightarrow [+fortis] \\ [-son] \end{array} \right\} / \text{POTENTIAL} + \frac{}{[\text{POTENTIAL mutation class}]}$$

Finally, all tone changes involve a high tone. A low to high tone change is specified for all of the cases involving an allomorph of the potential which does not include a vowel. This includes the zero allomorph:

$$\begin{array}{l} \text{V} \rightarrow [+HIGH] / \# ([-sy]) + C_c _ \\ [-HIGH] \end{array} \quad \text{POTENTIAL}^7$$

The analysis proposed for the completive and potential aspect correctly generates the allomorphs of the completive and potential aspects in ChZ. However, the analysis cannot give any explanation for facts such as the following. First, tone changes occur only when there is no vowel in the potential prefix. Furthermore, the tone is generally a high, precisely the tone of the allomorph $g\acute{i}$ -. A suppletive analysis such as the one proposed above essentially claims that this is accidental. Second, the potential allomorph is \tilde{c} - or \tilde{j} - before i - and y - initial verbs. Palatalization regularly occurs in these environments in other languages of the world. However, the fact that palatalization occurs in this environment is claimed to be accidental for ChZ. Third, the potential aspect allomorph never contains a vowel before vowel or y -initial roots in ChZ, an environment where deletion of a prefix vowel is likely. This is also treated as accidental in the suppletive analysis. Finally, the occurrence of the zero allomorph of the potential aspect morpheme coincides with fortition of the initial root consonant of a morphologically marked class of verbs in ChZ. This fact is also treated as accidental. In the following section I show that these facts are accounted for more insightfully in a nonsuppletive analysis.

2.0 Nonsuppletive analyses

In this section two competing solutions for the completive aspect are presented, followed by one solution for the potential aspect. I argue on the basis of the analysis of the potential aspect that one of the analyses of the completive aspect is preferable to the other. Finally, I show that the rules needed for the analysis of the completive and potential aspects have independent motivation from other facts of ChZ phonology.

2.1 Completive Aspect

Below are the alternations for the completive aspect.

<u>Root</u>		<u>Completive</u>	
12a. -daabi	<i>be rubbed</i>	bi-daabi	
b. -gaaɕi	<i>be buried</i>	bi-gaaɕi	
13a. -těsa	<i>raise</i>	gu-těsa	
b. -duša	<i>bark</i>	gu-duša	
c. -aza	<i>bathe</i>	gu-za	
d. -uʔá	<i>see</i>	b-uʔá	
e. -ǐnn	<i>sense</i>	b-ǐnn	
f. -yayí	<i>rotate</i>	b-yayí	
g. -yela	<i>belch</i>	b-yela	
h. -yooba	<i>be swept</i>	b-yooba	
i. -yu:ʔ	<i>enter</i>	gu-yu:ʔ	
j. -yāsa	<i>arise</i>	gu-yāsa	
<u>Root plus prefix</u>		<u>Completive</u>	
14a. -a-těsa	<i>cause to raise</i>	b-a-těsa	
b. -a-k ^w izi	<i>cause to dry out</i>	b-a-k ^w izi	<u>Root</u>
c. -iǰ ^y -apa	<i>watch (1pl)</i> ⁸	b-iǰ ^y -apa	-apa
d. -id-iʔá	<i>see (1pl)</i>	b-id-iʔá	-uʔá
e. -aǰi-duša	<i>bark (1pl)</i>	b-aǰi-duša	

Examples (15a-n) show root changes which are irregular.

<u>Root</u>		<u>Completive</u>
15a. -go:ba	<i>pull</i>	gu-do:ʔba
b. -b ^W iǰi	<i>call</i>	gu-diǰi
c. -guʔ	<i>put in</i>	gu-luʔ
d. -b ^W ĩ	<i>choose</i>	gu-lĩ
e. -awu	<i>eat</i>	gu-dawu
f. -abí	<i>swallow</i>	gu-dabí
g. -u:ʔǰi	<i>rot</i>	gu-yu:ʔǰi
h. -a	<i>ripen</i>	gu-ya
i. -yǎ	<i>go</i>	gu-ǎ
j. -e:ʔ ⁴	<i>drink</i>	gu-a:ʔ
k. -uua	<i>carry</i>	b-ia
l. -uulda	<i>sing</i>	b-iilda
m. -uta	<i>grind</i>	b ^W -eetu
n. -unn	<i>do</i>	b ^W -iinn

These changes in the initial segment of the root must be analyzed as being morphological, as they are not phonologically predictable. For verbs such as (15a,b) the change is that *g/b/b^W* become *d*, while for (15c,d) the change is that *g/b/b^W* become *l*. In (15e,f) an initial *d* is added, while in (15g,h) an initial *y* is added. In (15i) an initial *y* is deleted, while in (15j-n), vowel changes are made.

The spell-out rule for the completive aspect specifies *bi-* as the underlying form of the completive before the morphologically marked class *bi-*, as in (12a) *bi-daabi be rubbed*. The other allomorphs- *gu-*, *b-*, and *b^W-*, can be derived from *gb-* or *g^W-*, two analyses which I examine in turn. I begin with the analysis proposing *gb-*, which is similar to that proposed by Speck 1978 for Texmelucan Zapotec.

The *gu-* allomorph of the completive aspect is derived by *b* weakening to *u* in the following environments: before either another consonant, as in /*gb-těsa/gu-těsa* *raise*; before *a*, as in /*gb-aza/gu-za* *bathe* (by *a*-deletion, see section 1) and /*gb-a:ʔ/gu-a:ʔ* *drink*;

and before a morphologically marked class of y-initial roots, class y, as in /gb-yasa/gu-yasa *arise*. The weakening of b before y-initial verbs such as *arise* is thus considered to be exceptional, while the retention of b before y-initial verbs such as /gb-yela/b-yela *belch* is considered to be the rule.⁹ Vowel-initial roots such as /gb-a/gu-ya *ripen* which receive an initial y in the completive also trigger b-weakening and must be included in class y roots. Addition of the initial y must therefore occur before b-weakening.

Below is the rule of b-Weakening:

$$\text{b-Weakening}$$

$$b \rightarrow u / _ \left\{ \begin{array}{l} [\text{class } Y] \\ [+cns] \\ [a \\ RT] \end{array} \right\}$$

The b- allomorph is derived by Consonant Deletion. This rule deletes a noncontinuant before an obstruent, as in /gb-u[?]á/b-u[?]á *see* and /gb-yela/b-yela *belch*. Thus, in all forms where the b is not weakened, the g is deleted. The Consonant Deletion rule is given below:

Consonant Deletion

$$C \rightarrow \emptyset / _ C$$

$$[-cnt] \quad [-son]$$

The b-Weakening rule must be ordered before Consonant Deletion, or incorrect surface forms of the completive aspect will result. Finally, the b^w allomorph of the completive aspect is derived by first applying Consonant Deletion, then Rounding. Rounding changes b to b^w before stressed front vowels, as in /gb-iinn/b-iinn *do* and /gb-eetu/b^w-eetu *grind*. Below is the Rounding rule:

Rounding

$$b \rightarrow b^w / _ v$$

$$\left[\begin{array}{l} -back \\ +str \end{array} \right]$$

For verbs such as *do* and *grind*, the root mutation rules must apply before rounding in order to provide the proper environment for the rule to apply.

An alternative analysis posits g^w- as the underlying form of the allomorphs gu-, b-, and b^w-. The gu- allomorph is derived by a vocalization rule that changes g^w to gu- after the root mutations are made. As with b-Weakening, this change occurs in three

environments: before all consonant-initial roots (whether underlying or via mutation) as in /g^W-t̃esa/gu-t̃esa *raise* and g^W-awu/gu-dawu *eat*; before all a-initial roots as in g^W-aza/gu-za *bathe* (with a-Deletion) and g^W-yā/gu-ā *go*; and before class Y verbs as in /g^W-yāsa/gu-yāsa *arise* and /g^W-a/gu-ya *ripen*.

Below is the vocalization rule:

Vocalization

$$g^W \rightarrow gu/ \left. \begin{array}{l} \text{[class Y]} \\ \text{[+cns]} \\ \text{[a]} \\ \text{RT} \end{array} \right\}$$

The b- allomorph of the completive is derived by Fronting. This rule changes g^W to b before either y or vowels, as in /g^W-yayí/b-yayí *rotate* and /g^W-u?á/b-u?á *see*. The fronting rule is given below:

Fronting

$$g^W \rightarrow b/ _ \text{[-cns]}$$

This rule must be ordered after Vocalization, just as Consonant Deletion had to be ordered after b-Weakening. Finally, the b^W-allomorph is derived by the Rounding rule which has been given above.

Given the facts presented so far, there is no clear way to choose between the analysis of the completive aspect as underlying gb- and that which posits underlying g^W.

Both analyses work. Both need to make equal reference to morpheme classes as well as phonological environments. I show in section 2.2, however, that phonological changes associated with the potential aspect allow a choice between the two analyses.

2.2 Potential aspect

In this section I present an analysis of the potential aspect. Throughout the presentation independent motivation is given from other areas of ChZ for the phonological rules posited. These facts argue in turn that the underlying form of the completeve aspect in ChZ is g^W-.

Below are the alternations for the potential aspect:

<u>Root</u>		<u>Potential</u>
16a.	-těsa <i>raise</i>	gí-těsa
b.	-še'la <i>send</i>	gí-še'la
c.	-naazu <i>grasp</i>	gí-naazu
17a.	-biži <i>be dry</i>	gí-biži
b.	-daabi <i>be rubbed</i>	gí-daabi
c.	-gaači <i>be buried</i>	gí-gaači
d.	-jibí <i>be afraid</i>	gí-jibí
e.	-ziži <i>be sounded</i>	gí-ziži
f.	-žaata <i>be tightened</i>	gí-žaata
g.	-ro:ʔ <i>be grown</i>	gí-ro:ʔ
18a.	-b ^w í <i>choose</i>	k ^w í
b.	-bači <i>place</i>	k ^w ači
c.	-duša <i>bark</i>	túša
d.	-go:ʔba <i>pull</i>	kóba
e.	-zita <i>play</i>	číta
f.	-jiibi <i>wash</i>	číibi
g.	-ziʔ <i>buy</i>	síʔ
h.	-žu:ʔn <i>defecate</i>	šūn
i.	-robá <i>sprinkle</i>	čʹobá
j.	-luža <i>finish</i>	túža
19a.	-yǎ <i>go</i>	č-ě
b.	-yása <i>arise</i>	č-yěsa
c.	-yu:ʔ <i>enter</i>	č-ů

<u>Root</u>		<u>Potential</u>
20a. -yela	<i>belch</i>	ǰ-yéla
b. -yooba	<i>be swept</i>	ǰ-yóóba
c. -yuʔn	<i>shrink</i>	ǰ-úʔn
21a. -ǰinn	<i>sense</i>	ǰ-ǰinn
b. -e:ʔ	<i>drink</i>	g-é:ʔ
c. -a:ʔn	<i>plow</i>	g-á:ʔn
d. -uta	<i>grind</i>	g-úta
<u>Root plus Causative prefix</u>		
22a. -u-ǰaata	<i>tighten</i>	g-ú-ǰaata
b. -u-kʷizi	<i>dry out</i>	g-ú-kʷizi

The allomorphs for the potential aspect which are observed above are gǰ-, \emptyset -, \check{c} -, \check{j} -, and g-. I propose that all of the surface forms of the potential aspect are derivable by ordered phonological rules from the underlying form gi-. I first present the rules needed for the g- allomorph, followed by the rules for \check{j} -, \check{c} -, and the zero allomorph. The Fronting and Rounding rules given in section 2.1 for underlying g^W are shown to be independently motivated by the analysis of root-initial consonant changes associated with the potential. Finally, some tone rules are given.

The g- allomorph of the potential aspect is derived by Vowel Deletion, which deletes an unstressed vowel before either a following vowel or y, as in /gǰ-e:/g-é:ʔ *drink*, /gǰ-ǰinn/ǰ-ǰinn *sense* (by palatalization below), and /gǰ-yela/ǰ-yéla *belch* (by palatalization below). Vowel Deletion is given below:

Vowel Deletion

$V \rightarrow \emptyset / _ [-cns]$
 $[-str]$

Independent motivation for Vowel Deletion comes from changes in the causative prefix -sa-. The vowel of the causative prefix deletes before either vowel or y-initial roots, as in /r-u-sa-yela/r-u-s-yela *cause to belch*, habitual aspect and /r-u-sa-ǰinn/r-u-s-ǰinn *cause to sense*, habitual aspect.

The \check{j} - allomorph of the potential aspect is derived by Vowel Deletion and a following rule of Palatalization, which palatalizes g and k to \check{j} and \check{c} respectively before i and y. Vowel Deletion and Palatalization account for the form of the potential aspect in

/gí-ĩnn/ǰ-ĩnn *sense* and /gí-yela/ǰ-yéla *belch*. Palatalization is given below:

Palatalization

$$C \rightarrow \begin{bmatrix} +\text{cor} \\ +\text{high} \end{bmatrix} / - + \begin{bmatrix} -\text{cns} \\ -\text{back} \\ +\text{high} \end{bmatrix}$$

$$\begin{bmatrix} +\text{cns} \\ -\text{ant} \\ -\text{cor} \end{bmatrix}$$

Independent motivation for the palatalization rule can be found in the change which occurs in the *g-* causative prefix when it immediately precedes either *i* or *y*-initial roots. The unchanged form of this prefix occurs before vowel-initial roots other than *i*-initial, as in /r-u-g-awu/r-u-g-awu *cause to eat* (habitual aspect). Palatalization occurs with roots such as /r-u-g-yaši/r-u-ǰ-aši *cause to be happy* (habitual aspect) and /r-u-g-ĩnn/r-u-ǰ-ĩnn *cause to sense* (habitual aspect).

y-initial roots lose their initial palatalization in the potential aspect if the following vowel is high, as in /gí-yu[?]n/ǰ-ú[?]n *shrink*. Motivation exists for making palatal deletion more general. *r* alternates with \check{c}^Y before nonhigh vowels, as in /gí-robá/ \check{c}^Y obá *sprinkle* (by Fortition given below and Consonant Deletion), but with \check{c} before high vowels, as in /š-ru-/š-cu- *cough* (possessed) and /š-ri:[?]-/š-ci:[?]- *waterpot* (possessed) (by Fortition and Consonant Deletion). The palatal deletion rule therefore applies to either C^Y sequences, as with an intermediate form of /gí-yu[?]n/ǰ-ú[?]n *shrink*, or C^Y segments, as the \check{c}^Y which results from the fortition of *r* in /š-ru-/š-cu- *cough* (possessed form). Palatal Deletion must be ordered after Palatalization, since it does not bleed that rule. Note the following incorrect and correct derivations:

<u>Incorrect</u>		<u>Correct</u>	
Underlying Form	gí-yu [?] n <i>shrink</i>	Underlying Form	gí-yu [?] n
Vowel Deletion	g∅-yú [?] n	Vowel Deletion	g∅-yú [?] n
Palatal Deletion	g-∅ú [?] n	Palatalization	ǰ-yú [?] n
Palatalization	--	Palatal Deletion	ǰ-∅ú [?] n
Surface Form	g-ú [?] n	Surface Form	ǰ-ú [?] n

As can be seen from the derivations above, Vowel Deletion must apply

first in order to give the proper environment for Palatalization to apply, as Palatalization only applies across a morpheme boundary, not morpheme-internally.

The \check{c} - allomorph of the potential aspect is derived by the phonological rules discussed above, plus a minor rule of Fortition which changes the consonant of the potential aspect prefix to [+fortis]. It is a minor rule in that it is triggered only by a few y -initial verbs, as in /gí-yu:ʔ/ \check{c} - \check{u} *enter* and /gí-yása/ \check{c} -yása *arise*.¹¹ The rule is given below:

Fortition (minor)

$$\begin{array}{l} \text{C} \rightarrow [+fortis] / _ \\ \left[\begin{array}{l} \text{-son} \\ \text{POTENTIAL} \end{array} \right] \end{array} \left[\begin{array}{l} \text{verb} \\ [+Fortition] \end{array} \right]$$

Fortition must apply after Vowel Deletion in order to have the proper environment for application.

The zero allomorph requires rules which are different from those of the vowel and y -initial roots. The rules required are as follows: i -Deletion, Fortition, $r \rightarrow \check{c}^y$, $l \rightarrow t$, Consonant Deletion (see section 2.1), Fronting (see section 2.1), and Rounding (see section 2.1). i -Deletion deletes the i of the potential aspect morpheme before a class of morphologically marked verb roots, such as those in (18a-j). This brings the remaining g - in direct contact with the root-initial consonant and triggers a Fortition rule. The fortition rule (not to be confused with the minor rule above) changes a lenis obstruent to a fortis one if it precedes another obstruent across a morpheme boundary. An $r \rightarrow \check{c}$ rule applies in a similar way, changing r to \check{c}^y following any obstruent across a morpheme boundary. The $l \rightarrow t$ rule is much more restricted, changing l to t only following g - across a morpheme boundary. Following these rules, a Consonant Deletion rule (different from that in section 1) deletes a stop before a following obstruent. Also following these rules, the Fronting rule of section 2.1 changes g^w to b before either a vowel or y , and finally, the Rounding rule of section 2.1 changes b to b^w before stressed front vowels. These changes can be more readily understood by seeing them apply in the derivations below:

Underlying Form	gí-g ^{wĩ} <i>choose</i>	r-g ^{wĩ} <i>choose</i> (habitual)	gí-zi [?] <i>buy</i>	gí-robá <i>sprinkle</i>	gí-luža <i>finish</i>
i-Deletion	g∅-g ^{wĩ}	--	g∅-zí [?]	g∅-robá	g∅-lúža
Fortition	g-k ^{wĩ}	--	g-sí [?]	--	--
r-č ^y	--	--	--	g-č ^y obá	--
l-t	--	--	--	--	g-túža
Consonant Deletion	∅-k ^{wĩ}	--	∅-sí [?]	∅-č ^y obá	∅-túža
Fronting	--	r-bĩ	--	--	--
Rounding	--	r-b ^{wĩ}	--	--	--
Surface Form	k ^{wĩ}	r-b ^{wĩ}	sí [?]	č ^y obá	túža

Below are more formal versions of the above rules, except for those which have already been given above and need no further modification.

i-Deletion (minor)

$i \rightarrow \emptyset / g _ [C$
[i-deletion class]

Fortition

$C \rightarrow [+fortis] / \left[\begin{array}{c} C + \\ +cns \\ -son \end{array} \right] -$
[-son]

r-č^y

$r \rightarrow \check{c}^y / \left[\begin{array}{c} C + \\ +cons \\ -son \end{array} \right] -$

l-t

$l \rightarrow t / g _ +$

The Fortition rule has independent motivation from two sources: phonological changes in the causative form of verbs such as those in (17), and phonological changes in the possessed form of alienable nouns (those which take the \check{s} possessive prefix). Recall that there is a causative prefix, $g-$, which remains $g-$ before vowel-initial roots other than those beginning with i , as in the habitual causative form of *eat*, /r-u-g-awu/r-u-g-awu. The same $g-$ prefix is responsible for the fortition in the causative form of -gaaŋi *be buried*,

/r-u-kaaʔi *bury* (habitual). In the possessed form of nouns there is fortition as well if the \check{s} - prefix is involved, as in the possessed form of *da:ʔ palm fiber mat*: /s̄-da:ʔ-/s̄-ta:ʔ-. That it is fortition and not devoicing is indicated by the fortition that occurs when nasals precede or follow another consonant, as in the possessed form of *ñisa water*: /s̄-ñisa-/s̄-ññisa-, /bʷiñ##gula/bʷiññ gula *old person*. (The last facts indicate that the rule of Fortition given above is actually more general than indicated by the present formalization.)

Consonant Deletion is motivated mainly on the basis of changes in Spanish loanwords, as in Sp. *arquitecto* (phonemically *arkitekto*) *architect* versus ChZ *arkitētu*. In addition, no consonant clusters of stop-obstruent exist in indigenous ChZ words either. It is therefore likely that Consonant Deletion expresses a true constraint of ChZ phonology.

Fronting and Rounding are independently motivated on the basis of their application in the completive aspect. This is particularly true for the Fronting rule, which claims that the b or b^W - k^W alternations of verb roots in the potential aspect are parallel to the b and b^W - gu alternations in the form of the completive aspect allomorph. This claim makes it possible to choose between the analysis claiming underlying gb - for the completive aspect and that claiming g^W -. The latter analysis can make a generalization about the b or b^W - k^W : b or b^W - gu parallelism, while the former essentially claims that these alternations are unrelated. g^W - can therefore be said to be the underlying form of the completive aspect on the basis of independent motivation.

I now present some tone rules. These are offered tentatively for two reasons. First, the tone processes of ChZ are not yet fully understood. Second, a complete analysis of the tone changes associated with the potential aspect is not germane to the purpose of this paper, namely to compare alternative analyses of the completive and potential aspects. All that is necessary is to show that a nonsuppletive analysis makes generalizations about the potential aspect tone changes and gives independent motivation for the analysis, while a suppletive analysis does not. With these two points in mind, I now present a floating tone rule, and suggest what further tone changes are necessary for the potential aspect.

The Floating Tone rule has as its basic assumption that a high tone does not delete when the segment associated with it deletes.¹² Rather, the high tone associates itself with the next syllable nucleus to the right, provided that there is no high or rising tone present. The low tone which was present in the underlying form of the root is essentially overlaid with the new high tone, as a high-low contour does not result from the reassociation of the high tone. Examples of the effects of this are /gí-aza/g-áza *bathe* and /gí-yela/j-yéla *belch*, but not /gí-inn/j-inn *sense*, as Floating Tone does not apply to roots with underlying nonlow tones.

The rule is given below:

Floating Tone

$$\begin{array}{ccc} \text{H} & \text{L} & \text{H} \\ | & | & | \\ \emptyset & (\text{y})\text{V} & \rightarrow \emptyset(\text{y})\text{V} \end{array}$$

Two further changes occur in the potential after Floating Tone applies, and these changes apparently do not need to be ordered with respect to each other. The changes are Tone Lowering and High-Glide Perturbation. Tone lowering lowers a high or rising tone to low before a following syllable bearing either a high or rising tone. A further condition on Tone Lowering is that it can only apply to roots and not morphemes, such as the potential aspect, as seen in the surface form of /gí-těsa/gí-těsa *raise*. Otherwise, Tone Lowering occurs, as in /gí-robá/čȳobá *sprinkle* and /gí-u'á/g-u'á *see*. A final constraint on Tone Lowering comes from other data besides potential aspect changes, as in /čȳopá##b^wiñ##rō:ʔ/čȳopá b^wiññ rō:ʔ *two big people*. From the latter example, it can be seen that Tone Lowering must apply from right to left. High-Glide Perturbation changes a high tone to a rising tone on a long checked vowel of a consonant-initial root, as in /gí-yu:ʔ/č-ũ *enter* and /gí-žú:ʔn/šũn *defecate*, but not in /gí-a:ʔn/g-á:ʔn *plow* because the latter root is not consonant-initial. As part of the change, the vowel loses its checking but retains its length, which is a phonetic feature of vowels with rising tone.

Independent motivation for the rule of Floating Tone is found in tone changes which occur in connection with the unreal aspect, which has the underlying form ñi-. This form surfaces before consonant-initial roots, as in /ñí-těsa/ñí-těsa *raise*. The i deletes before vowel and y-initial roots, while the high tone transfers onto the initial syllable nucleus, as in /ní-aza/ñ-áza *bathe* and /ñí-yela/ñ-yéla *belch*.

In the suppletive analysis outlined in section one, a tone change occurred in a root whenever the potential aspect did not contain a vowel. No explanation was given for this change. In the non-suppletive analysis, however, the tone change is explained in that the high tone of the deleted vowel shifts over onto the next vowel to the right. Furthermore, it was shown that this rule was independently needed to account for changes in the unreal.

3.0 Conclusion

The following comparisons can be made between the suppletive and nonsuppletive solutions for the completive and potential aspects of ChZ. It was noted at the end of section one that the suppletive solution fails to answer certain questions, such as why tone changes occur in verb roots when the potential aspect does not contain a vowel. As was shown in section two, a nonsuppletive analysis answers the questions as follows: first, tone changes occur in verb roots whenever

the vowel of the potential aspect is deleted and the tone is re-assigned to the root. Thus, the tone change of low to high tone is caused by the high tone of the vowel which is deleted. Second, the potential aspect allomorph does not contain a vowel before vowel or y-initial roots because it is deleted by a vowel-deletion rule. Third, the potential aspect allomorph is \check{c} - or \check{j} - before i and y-initial roots because of a palatalization rule that changes k or g to \check{c} or \check{j} , respectively. Finally a zero allomorph of the potential occurs before a morphologically marked class of verbs because a minor rule deleting the i puts the g- in direct contact with the consonant of the verb root. The g triggers the application of a general fortition rule before being deleted.

A suppletive analysis is concerned only with a particular set of facts and ignores the relation of these facts to facts elsewhere in a language. A nonsuppletive solution, on the other hand, accounts for the facts by the expression of generalizations which are often seen operating elsewhere in the language.

Two examples of how the nonsuppletive solution given above does this are the following. First, it has been shown that the Fronting rule can account for both the b- or b^w - -gu and the b or b^w - b^w alternations. Second, the tone changes in vowel and -initial roots in the potential are accounted for by the Floating Tone rule, which can also account for tone changes in the unreal aspect with vowel and y-initial roots.

FOOTNOTES

¹Chichicapan Zapotec is spoken in the town of San Baltazar Chichicapan in the district of Ocotlan, Oaxaca, Mexico, and there are approximately 3,000 speakers. ChZ has the following phonemic inventory: fortis stops p, p^w, t, t^y, k, k^w; lenis stops b, b^w, d, d^y, g, g^w; fortis affricates tʃ, c, c^y, ʧ; lenis affricates z, j, j^y, ʝ; fortis sibilants s, š; lenis sibilants z, z^y, ž; liquids r, l; fortis nasals mm, nn, ññ; lenis nasals m, n, ñ; semivowels w, y; tones high (V), mid (V̄), rising (V̇), and low (not written); laryngeal glottalization (VV), checked glottalization (V^ʔ), and long checked glottalization (V:ʔ); and stress (') (penultimate unless written). Fortis consonants in ChZ are phonetically characterized by firm articulation and length immediately after stressed vowels and firm articulation elsewhere. Lenis consonants are phonetically characterized by weak articulation.

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²ChZ has at least six aspect categories: habitual (r-), potential (gí-), incomplete (zi-), completive (g -), unreal (ñí-), and present continuous (káy-).

³b- becomes b^w- before stressed front vowels, as is shown in section 2.1 below.

⁴This root is -e:ʔ in all aspects except the completive, where a stem formation rule changes it to -a:ʔ. For more information on stem-formation changes, see section 2.1.

⁵a-Deletion only occurs after u, since Vowel Deletion, given in section 2.2, deletes any vowel before another vowel or y, as in /gí-aza/g-áza *bathe* (potential) and /r-u-sa-yela/r-u-s-yela *cause to belch* (habitual).

⁶Fortis and lenis obstruents are distinguished by their relative degree of articulator pressure, phonetic length after stressed vowels, and phonetic voicing. Fortis obstruents have high articulator pressure and are phonetically voiceless, while lenis obstruents have weak articulator pressure and voicing. As was mentioned in footnote 1, fortis consonants in general are long after stressed vowels.

⁷[+HIGH] and [-HIGH] refer to tone features, not vowel features. Treating mid tone as not being a part of the tone system, as it usually only occurs on the stressed syllable of recent Spanish loan-words, the tones high, low, and rising can be characterized as follows: [+HIGH], [-HIGH], and [-HIGH]-[+HIGH], respectively.

⁸The morphemes $-i\check{y}$ - and $-id-$ display complicated allomorphy which will not be described here.

⁹There are two reasons for this. First, y patterns with vowels in other rules of ChZ (see Vowel Deletion in section 2.2 for example). Second, underlying g^w- , the completive aspect, becomes b before the great majority of y -initial roots.

¹⁰Exceptions to Rounding, such as $/gb-uua/b-ia$ *carry* are few. Cases such as *carry* are therefore considered to be lexically marked [-Rounding] and Rounding is considered to be a general rule of ChZ.

¹¹Minor rules apply either to phonological forms which trigger changes, as in this case, or to forms which undergo changes.

The root vowel a is fronted in $/g\acute{i}-y\check{a}sa/\check{c}-y\check{e}sa$ *arise* and $/g\acute{i}-y\check{a}/\check{c}-\check{e}$ *go*, and the root-initial y is deleted in the latter. These changes are limited to these two forms.

¹²This is similar to the notion behind autosegmental phonology as proposed by Goldsmith 1975. Instead of the Floating Tone rule, Goldsmith would propose that there is tone reassignment which does not need to be specified, as it falls out from universal principles in a manner such as the following:



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