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FORTIS VERSUS LENIS IN CAJONOS ZAPOTEC PHONOLOGY

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0. Introduction
1. Consonants
2. Vowels
3. Suprasegmentals
4. Alternative analyses
5. Loan words

0. Like most Zapotec languages, Cajonos Zapotec (henceforth CZ) makes a distinction between fortis (tense) and lenis (lax) consonants.¹ Of particular interest in CZ is the devoicing of word-final (and in some cases word-initial) lenis consonants, which extends even to most sonorants. Also of interest is the large number of consonants that are pronounced as fricatives in at least some environments, and the extreme phonetic diversity of the allophones of *y*, ranging from a sibilant to a partly syllabic vocoid.

This article is limited to a description of the word. Words of up to five syllables, including one to seven morphemes, have

¹ Cajonos Zapotec is spoken by approximately 6,000 people living in the southern part of the district of Villa Alta, Oaxaca, Mexico. Data for this article were gathered by Nellis during field trips to San Pedro Cajonos from 1973–78 under the auspices of the Summer Institute of Linguistics; the principal informants were Benigno Bautista S. and Taurino Ruiz. We would like to express our appreciation to Eugene Casad, who provided considerable help at an earlier stage of analysis and writing. We would also like to express our appreciation to Charles Speck, Inez Butler, and Becky Long, who read earlier drafts of the manuscript and made many helpful suggestions, and to Roger Reeck, who helped us locate the source of several old Spanish loan words.

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been recorded to date. A root typically has one or two syllables, rarely three. Some that appear to have three are probably old compounds for which we have not yet been able to find the source. Morpheme breaks are indicated by + in all examples.

1. The most pervasive contrast in the CZ consonant system is the fortis–lenis dichotomy. With the exception of two fortis fricatives found only in loan words, a fortis bilabial nasal, and two lenis semivowels, all consonants fall into fortis–lenis pairs. Fortis and lenis consonants are clearly distinguished from each other in all positions in the word by a number of phonetic signals.

Fortis stops are always voiceless and are never weakened to fricatives. Lenis stops are often weakened to fricatives. Lenis stops are also sometimes devoiced, but a devoiced lenis stop is always articulated more weakly than the corresponding fortis stop. Fortis affricates, sibilants, and fricatives are always voiceless and have stronger friction than their lenis counterparts; this friction serves to distinguish them even in positions where the lenis ones are devoiced.

In sonorants, length is the chief means of distinguishing between fortis and lenis; a fortis sonorant is always longer than its lenis counterpart. A variety of other features help further to distinguish individual pairs of sonorants. Only the lenis alveolar nasal assimilates to the point of articulation of a following consonant. Only the lenis lateral devoices. The fortis alveolar vibrant is a trill or retroflex sibilant, whereas the lenis one is a flap.

All fortis consonants are lengthened following a vowel with primary stress, whereas stressed vowels are themselves lengthened preceding a lenis consonant. This lengthening serves to maintain a fairly constant length for stressed syllables (if the postvocalic consonant is considered part of the syllable) and provides an additional distinction between the two series.

In the remainder of this section, we present the consonants of CZ and show them in contrast with phonetically similar consonants, describe the allophonic rules that affect them, and discuss their distribution into clusters.

CZ obstruents include stops, affricates, sibilants, and fricatives; all but two fricatives group into fortis-lenis pairs.

There are six stops: p, b, t, d, k, g. The members of each pair contrast in word-initial, intervocalic, and word-final positions, but initial p is found only in Spanish (henceforth Sp.) loan words: pén *almost* (Sp. apenas), b+èn *do!* gòpée *fog*, dòbée *feather*, y+áp *will care for*, y+áb *will weave*, tò *one*, dò *string*, ^hyít+à[?] *the squash*, ^hyíd+à[?] *the leather*, yèt *tortilla*, zèd *disturbance*, kóc *pig* (Sp. cuchi), góc *gunny sack*, w+áké *it can*, wágé *firewood*, w+ák *it can*, wág *firewood*.²

There are four affricates: c, z, č, j. The members of each pair contrast in all three positions: cón·é *three*, zóm·é *basket*, wácèe *large lizard*, wázèe *thick tortilla*, lic *document of*, liž *house of*, čá[?] *mine* (pronoun), j+â[?] *I go*, ^hčičè+n *it is hard*, j+óžèn+èe *I paint*, léč *milk* (Sp. leche), čič *strong*, m·èj *money* (Sp. medio).

² Many nouns in CZ have two different forms, one with a final é and the other without. In isolation either form may be used; preceding another word in the sentence the shorter form is more common. In that older speakers are more likely to use the fuller form than younger speakers, the shorter form seems to be an innovation.

Alveolar stops t, d contrast with the corresponding affricates: tâa *bamboo mat for corn*, c+â[?] *I'm going*, čá[?] *mine*, yít *squash*, yíc *grindstone*, léč *milk*, čič *strong*, dód *pine needle*, zòd *vulture*, jò[?] *we* (inclusive), bíd *bedbug*, zèd *disturbance*, yêz *town*, m·èj *money*.

There are four sibilants: s, z, š, ž. The latter two are retroflex, unlike č and j, which are alveopalatal. The members of each pair contrast in all three positions: s+âa *I will go*, z+âa *I'm coming*, ^hnís+à[?] *the water*, ^hnèz+à[?] *the road*, nís *water*, nèz *road*, š+á+nà[?] *my father*, ž+á+nà[?] *my clothes*, bèšé *tomato*, bèžé *scratch* (noun), bèš *tomato*, bèž *scratch*.

The sibilants contrast with the corresponding affricates: s+á[?] *I will go*, c+â[?] *I'm going*, nís *water*, yíc *paper*, zée *wall*, z+ée *they're inside*, yêz *cigarette*, yêz *town*, š+á[?] *my father*, čá[?] *mine*, yış *avocado*, bíč *chip*, ž+ò[?] *your clothes*, jò[?] *we*, bèž *scratch*, bèj *a kind of dove*.

There are four fricatives: f, x, R·, R. f and x are labiodental and velar, respectively; they are found only in Spanish loan words. f contrasts with p and b in all three positions: fân *Epifania* (name), pá *term of affection used to little boys* (Sp. papá), bát *when?* ká^hfê *coffee* (Sp. café), gòpée *fog*, dòbée *feather*, r·if *raffle* (Sp. rifa), bíp *pointed stick*, cíb *goat* (Sp. chivo). x contrasts with k and g in word-initial and word-final positions: xêr *hurry up!* (Sp. ligero?), két *Enriqueta* (name), g+ít *will die*, r·ax *slice* (Sp. raja), r·ák *curly-haired goat* (Sp. ?), zàg *cold* (adjective). R· and R are fortis and lenis uvular fricatives, respectively, sometimes accompanied by a trill; R· occurs only word-finally: Ríd *chicken*, RèRé *San Miguel Cajonos* (town), yéR· *rock*, yèR *flower*, číR *house wren*, bà+yéR· *go away!* bá+yéR *comb* (*animal finder*).

R· contrasts with š: yéR· *rock*, bèš *tomato*. R contrasts with ž: Ríd *chicken*,

žid *cat*, bèR *cloud*, bèž *scratch*. R· contrasts with x: yéR· *rock*, r·áx *slice*. R contrasts with g, which has a fricative allophone: yèR *flower*, bèg *nuisance*.

CZ sonorants include nasals, liquids, and semivowels; all but three group into fortis–lenis pairs. In that the most prominent phonetic feature of fortis sonorants is length, a raised dot is used in this article to distinguish them from their lenis counterparts.

There are three nasals: m·, n·, n. m· occurs in all three positions, but in word-initial position it occurs only in Spanish loan words: m·éc *wick* (Sp. mecha), zóm·é *basket*, dám· owl. The two alveolar nasals contrast in all three positions: n·éz +dèe *I know*, nèz *road*, g +ón· +èe *I will give*, g +ón +èe *I will do*, b +èn· *give!* jèn *blood*.

The bilabial nasal contrasts with b in all three positions: m·éc *wick*, bèg *nuisance*, zòm·é *basket*, dòbée *feather*, dám· owl, y +áb *will weave*.

There are four liquids: l·, l, r·, r; it is also possible to classify R· and R as liquids, rather than fricatives. The two laterals contrast in all three positions: l· +ê? *him, her* (respect), lé? *you*, wál·èe *large lizard*, w +àl +é? *he will escape* (respect), bêl· *fish*, yêl *sandal*. r· is an alveolar trill, and r is an alveolar flap. r· occurs only in Spanish loan words, and r occurs in native words only intervocalically, where it is somewhat rare. They contrast in all three positions: r·ánc *ranch* (Sp. rancho), râd *plow* (Sp. arado), kár·ét *wheel* (Sp. carreta or carrete), tírócée *hummingbird*, syêr· *saw* (Sp. sierra), m·êr *almost* (Sp. mero). The word for *hummingbird* is probably onomatopoeic, though it may be related to Spanish chuparrosa.

l· contrasts with r· in all three positions: l· +ê? *him, her*, r·êy *line* (Sp. raya), wál·èe *large lizard*, kár·ét *wheel*, bêl· *fish*, syêr· *saw*. l contrasts with r in all three positions:

léč *milk*, râd *plow*, gô +lís *small potato* (gô + Sp. liso), kóriz *squirrel* (Sp. ?; cf. Latin sciurus), yêl *sandal*, m·êr *almost*.

r· contrasts with š in all three positions: r·ánc *ranch*, š +á? *my father*, kár·ét *wheel*, bèšé *tomato*, syêr· *saw*, bèš *tomato*. r contrasts with ž in all three positions: râd *plow*, †ž +á +nà? *my clothes*, tírócée *hummingbird*, bèžé *scratch*, m·êr *almost*, bèž *scratch*. r· contrasts with R· in word-final position: syêr· *saw*, yéR· *rock*. r contrasts with R in all three positions: râd *plow*, RèRé *San Miguel Cajonos*, tírócée *hummingbird*, †číR +à? *the house wren*, m·êr *almost*, bèR *cloud*. r also contrasts with t and d in all three positions: râd *plow*, tâa *bamboo mat for corn*, dám· owl, tírócée *hummingbird*, †yít +à? *the squash*, †yíd +à? *the leather*, bâr *rod* (Sp. vara), bát *when?* bêd *Pedro* (name).

There are two semivowels: w, y. Both pattern as lenis consonants. w contrasts with b and f in all three positions: wá *take it!* bà *grave* (noun), fân *Epifania*, j +šâw +ée *he whistles* (respect), š +á +bée *his father* (familiar), ká†fê *coffee*, béw *shoe-shaped pitcher*, bèb *trash*, r·if *raffle*. y contrasts with j in all three positions: yô *earth*, jô? *we*, bà +†yéR· *go away!* bá +†jêR *stocky* (animal), w +yèy *burn* (*yourself!*) yèj *hole*. y also contrasts with š and ž in all three positions: yíd *skin*, †šilè +b *its wings*, žid *cat*, bèyée *ice*, yišée *weed*, bèžé *scratch*, béy *sash* (Sp. paño), bèš *tomato*, bèž *scratch*. y also contrasts with g in all three positions and with x in word-initial and word-final positions: yà *iron* (metal), xên *Eugenio* (name), gà *nine*, bèyée *ice*, bègèe *squash gourd*, l·êy *a nettlelike plant* (*Jatropha urens*), r·áx *slice*, líx *sandpaper* (Sp. lija), bèg *nuisance*.

CZ has six phonemes that are pronounced as sibilants in at least some environments. In addition to s, z, š, and ž, both y and r· have sibilant allophones. y

is often devoiced in prevocalic position, and the additional airflow results in friction; some speakers front this palatal fricative to a fronted alveopalatal sibilant. *r* is a tongue-tip trill, which varies freely with a slightly retroflex sibilant, intermediate between the fronted alveopalatal variant of *y* and the fully retroflex sibilant phonemes. In spite of the crowding of the phonetic space, we have observed no instances of neutralization among these six phonemes.

CZ has five phonemes that are pronounced as flat fricatives between the palatal and uvular points of articulation. In addition to *R* and *R*, both of which have friction at the uvular point of articulation, often accompanied by a trill, there are *y*, *g*, and *x*. *y* is usually a palatal fricative word-initially and finally. *g* is weakened to a velar fricative in most environments, and in some of these it is also devoiced. *x* is a fortis velar fricative in all environments; it is always articulated more strongly than *g*. *g* and *x* are consistently farther back than *y* and farther forward than *R* and *R*.

We next present a number of the most significant allophonic rules that affect consonants. More rules affect lenis consonants than fortis, which is probably a reflection of the inherently greater stability of the latter. Morphophonemic rules are outside the scope of this article.

Fortis consonants are lengthened following vowels with primary stress (¹) (see 3): ¹*bát* *when?* ¹*zóm'é* *basket*, ¹*bén'é* *person*. Alternatively, it would be possible to consider fortis consonants inherently long in their underlying form and shortened elsewhere; see the discussion in 2.

Fortis sonorants *m*, *n*, and *l* become strongly syllabic when they occur as the initial member of a prevocalic cluster: *m'râž* *orange* (Sp. *naranja*), *n'tôn* *Antonio* (name), *l'bérg* *pea* (Sp. *alverja?*). Lenis *n*

is weakly syllabic in this position: *ngól* *soft*.

Fortis stops and affricates are optionally aspirated word-finally; the tendency is even stronger in phrase-final position: *bíp* *pointed stick*, *bíč* *chip*.

Lenis stops *b* and *g* are weakened to fricatives in all positions except following a nasal or lateral: *bát* *when?* *bkòg* *aisle*, *dòbée* *feather*, *cíb* *goat*, *gòpée* *fog*, *bgôg* *inca dove*, *bá+gásR* *black animal*, *bèg* *nuisance*; but *b+èn+bée* *he did* (familiar), *gríngw* *light-skinned foreigner* (Sp. *gringo*), *l'bérg* *pea*. The lenition is weakest word-initially preceding a vowel. *d* is perceived as a weak stop in all positions: *dò* *string*, *ldít* *swamp*, *bá+dô?* *small animal*, *bêd* *Pedro*.

The lenis alveolar nasal assimilates to the point of articulation of a following consonant: *b+èn+bée* *he did* (familiar), *b+¹èn+ks+é?* *he certainly did* (respect). The fortis nasal does not assimilate: *b+èn+bée* *he gave* (familiar), *b+¹èn+ks+é?* *he certainly gave* (respect).

There are several distinct rules that devoice lenis consonants, primarily at word margins. All lenis consonants except *n* and *w* devoice word-finally following a vowel; *y* and *l* become strong fricatives when devoiced because of the increased airstream. This rule is optional in the case of high tone, but obligatory elsewhere. Examples of devoicing: *bêd* *Pedro*, *wêl* *Manuel* (name), *síy* *chair* (Sp. *silla*), sometimes *béy* *sash*. Examples without devoicing: *lén* *with*, *béw* *shoe-shaped pitcher*, sometimes *béy* *sash*.

All lenis consonants except *n* devoice in a word-final consonant cluster: *zík* *w* *Francisco* or *Chico* (name), *gríngw* *light-skinned foreigner*, *yèzr* *flour*.

w also devoices in the middle of a cluster following a voiceless consonant: *cikwlát* *chocolate* (Sp. *chocolate*), *žikw+nidèe+jóo* *our arm pit*.

Another devoicing rule affects only l; it is optionally partially devoiced word-initially preceding a vowel: lé^ʔ *you*, lâa *but*. When it is not devoiced word-initially, l has some friction: lé^ʔ *you*, lâa *but*. Following another consonant and intervocalically l also has friction: blíc *blister*, bèlée *meat*.

A further devoicing rule affects only y; it is devoiced preceding the vowel i. This makes y more consonantal before i and is thus a form of dissimilation. Examples: yî *swelling*, byín'é *bird*, bà + yîšée *animal*.

y is also optionally devoiced word-initially preceding a vowel or another consonant; some speakers are more likely to apply this rule than others: yàg *tree*, yêl *sandal*, ywà^ʔ *baggage*.

A further rule optionally affects a devoiced prevocalic y, pronounced as a palatal fricative, and converts it into a fronted alveopalatal fricative: yî *swelling*, bà + yîšée *animal*, byín'é *bird*.

Lenis consonants other than n or w devoice word-initially preceding any consonant: žcílé *Zoochila* (town), byín'é *bird*, Rnis *Yaganiza* (town), Inì *fiesta*.

Two rules turn semivowels into partially syllabic vowels. When w is the first member of a prevocalic cluster, or when it is postvocalic, it becomes partially syllabic: wbìn *famine*, w + lâp *harvest*, béw *shoe-shaped pitcher*.

Following another consonant and preceding a vowel both y and w are partially syllabic, except that w is not syllabic after k or g; see the discussion in 4: ž + yàg + jóo *our tree*, žRásyâ *Xagacia* (town), žwâ^ʔ *corn*; but ž + ʷlákwi + n *its bark* (tree).

As can be seen above, y often undergoes different rules from w. For example, w never becomes a voiceless fricative, and y does not become partially syllabic word-finally. Only between a consonant and a vowel (as mentioned above) and in intervocalic position before o, e, or a (where

both are semivowels) do they have parallel pronunciations. w is also a semivowel when it occurs alone in prevocalic position. Examples of y and w pronounced as semivowels: bèyéé *ice*, ʷbéw + à^ʔ *the shoe-shaped pitcher*, wág *firewood*.

Note that y has a far broader range of phonetic realizations than is usually expected for a single phoneme; they range from a sibilant to a partially syllabic vocoid. In spite of the phonetic diversity, however, there are compelling distributional and morphophonemic reasons for considering them all allophones of y. The fact that CZ y is cognate with both y and gy in other Zapotec languages suggests that the two have merged in CZ; this may help to account for the fact that y sometimes behaves like an obstruent.

To date, we have discovered no significant restrictions on sequences of consonants across morpheme boundaries; we therefore have found no automatic rules in which one consonant is replaced by another. A number of morpheme-specific changes involving possessive and aspect prefixes have been found, but they are outside the scope of this article.

With the exception of R; which occurs only in word-final position, all consonants occur in word-initial, intervocalic, and word-final positions, although p and s are somewhat rare in word-initial position. Examples have been given above.

In both stressed and unstressed syllables of roots, fortis and lenis consonants occur: ʷkwàgée *beam*, číʷbē^ʔ *crab*. In inherently unstressed affixes, however, only lenis consonants occur: ʷb + èn + bée *he did* (familiar), ʷl'éy + jóo *our tooth*, dīi + ʷlá *fever*.

Consonant clusters in native words are very common, show few restrictions in composition, and therefore fall into no clear patterns. Many clusters occur across obvious morpheme boundaries, and the

random nature of the ones that occur morpheme-internally leads us to believe that most of them are recent developments from the fusion of two morphemes. Many occur in only a few words and some in only one. For example, many morpheme-initial clusters have *b* as the first member, and a majority of the examples of these clusters are names of animals. There is a semiproductive animal classifier of the form *bá* or *bà* in present-day CZ, and it seems almost certain that animal names beginning with clusters having *b* as the first member are fused compounds, with loss of the vowel. Vowel loss may explain other initial clusters also. Medial clusters usually occur across morpheme boundaries, and most of the ones that occur within single morphemes probably represent two morphemes historically, but either the meaning of the parts has been lost or else we have not been able to discover the meaning to date. Most morpheme-final clusters end in *R*. In spite of the lack of semantic unity among examples of these clusters, it seems likely that the *R* is a reflex of some suffix morpheme. Some of the clusters with *R* as the second member also occur medially because the morpheme they are in has an alternate form with final *e* (see n. 2). One cluster pattern that probably has existed within native morphemes from an earlier period is velar stop plus semivowel. The heavy proportion of Spanish loan words in the CZ lexicon has also added to the inventory of clusters.

The initial clusters recorded to date in native morphemes are: *bk*, *bg*, *bč*, *bj*, *bz*, *bž*, *bn*, *bl*, *bl*, *br*, *by*, *tl*, *ty*, *dw*, *ks*, *kw*, *cw*, *čw*, *čy*, *řw*, *sc*, *žc*, *žR*, *žw*, *Rn*, *Rl*, *lt*, *ld*, *lč*, *ln*, *lw*, *ly*, *wb*, *lRš*. Examples: *bkògé aisle*, *bgôg inca dove*, *bčè? wild honeycomb*, *bjè? ant*, *bzínée mouse*, *bžè? coati* (*Nasua narica*), *bnà? turkey-hen*, *bl'aašaa Mexican jay*, *blòR cave*, *briséé doe*, *byín'é bird*, *tlàp level*, *b+ty+ò+n you piled it up*, *dwá?*

century plant, *kwàgée beam*, *s+tó+ksé again*, *cwáp Choapan* (town), *čwà forty*, *l'bič+čyà acorn*, *řwaa+jóo our mouth*, *scinée Zochina* (town), *žcilé Zochila*, *žRásyâ Xagacia*, *žwâ? corn*, *Rnis Yaganiza*, *ž+Rl'ô+b its intestines*, *ltáa hillside*, *ldit swamp*, *lčítée cross-eyed*, *lni fiesta*, *lwî+n its root*, *l'yà?+nà? patio*, *wbin famine*, *lRšiz San Francisco Cajonos* (town).

The medial clusters recorded to date in native morphemes are: *ty*, *kw*, *cR*, *čR*, *sy*. Examples: *bètyà? rainbow*, *ž+lákwi+n its bark* (tree), *l'ócRê+b its fangs*, *l'zičRè+n it is sour*, *žRásyâ Xagacia*.

The final clusters recorded to date in native morphemes are: *pR*, *tR*, *dR*, *kw*, *cR*, *žR*, *čR*, *řR*, *sR*, *zR*, *šR*, *žR*, *n'R*, *lR*. Examples: *yápR vegetable pear*, *žitR stream* (noun), *bžidR woodpecker*, *žikw+nidèe+jóo our armpit*, *yà+dii+jácR rifle*, *lyág+l'zizR oak tree*, *bòčR horsefly*, *bějR turkey*, *gásR black*, *yèzR flour*, *yíšR bag*, *dii+nóžR that which is split*, *b+din'R landslide*, *žèelR dew*.

To save space, we do not list the clusters found in loan words or across morpheme boundaries. Clusters containing from two to six members have been recorded to date in such words; we present a few representative examples: *s+tô another*, *gringw light-skinned foreigner*, *lyèR+l'syò? cloudburst*, *lyičR+l'yôo roof*, *l'bějR+l'bnà? female turkey*, *št+lRšiz even San Francisco Cajonos*, *št+ž+bsy+ê? even his hawk* (respect).

2. In this section, we present the vowels of CZ and show them in contrast with phonetically similar vowels, describe the regular rules that affect them, and discuss their distributional restrictions.

There are three series of vowels in CZ: simple, checked, and laryngealized. Each series has four contrasting tongue positions. The simple vowels are *i*, *o*, *e*, *a*. *e* varies from mid open to low close; some

speakers tend more toward the lower articulation than others. *o* is phonetically intermediate between *o* and *u*. Examples: *bít* *goosefoot* (*Chenopodium album*), *bót* *vote* (Sp. *voto*), *bét* *Beto* (name), *bát* *when?*

The checked vowels are *i*[?], *o*[?], *e*[?], *a*[?]; they are articulated as a vowel followed by a glottal stop: *zí*[?] *hurt* (adjective), *z+ó*[?] *you are there*, *z+e*[?] *he is standing* (respect), *z+á*[?] *is coming*,

The laryngealized vowels are *ii*, *oo*, *ee*, *aa*; they are articulated as a rapid sequence of two vowels with an intervening glottal stop. Sometimes there is laryngealization on the two vowel morae, and sometimes the break between them is a peak of laryngealization rather than a full glottal closure. In spite of the fact that there are three phonetic segments, laryngealized vowels pattern as single-vowel segments. Examples: *zí* *heavy*, *yóo* *quicklime*, *zée* *wall*, *z+ãa* *I'm coming*.

Simple vowels contrast with their checked and laryngealized counterparts: *bí* *what?* *zí*[?] *hurt*, *bii* *this morning*, *yô* *earth*, *bò*[?] *charcoal*, *yôo* *house*, *bè* *butterfly*, *bè*[?] *wind*, *bée* *a kind of weed*, *zá* *lard*, *z+á*[?] *is coming*, *zâa* *roasting ear*.

For some speakers, Spanish loan words have introduced an additional vowel, *u*. For example, some bilinguals pronounce Spanish *burro* *donkey* as *bûr*, while other speakers pronounce it *bôr*; in contrast, all speakers pronounce the native word for string as *dò*.

A number of allophonic and automatic morphophonemic rules affect vowel segments.

Simple vowels with primary or secondary stress are lengthened in open syllables and preceding lenis consonants: *dò* *string*, *wí* *guava*, *m'êj* *money*, *žâ+b* *animal skin*. Note that vowels are lengthened before some consonants that are not members of fortis-lenis pairs: *béy* *sash*, *bév* *shoe-shaped pitcher*. Note also that this rule

applies before consonant clusters, if the first member of that cluster is lenis: *bějR* *turkey*, *lyèR+syò*[?] *cloudburst*.

Checked vowels with primary or secondary stress are also lengthened: *l'â*[?] *Oaxaca* (city), *zí*[?] *hurt*, *bò*[?] *charcoal*, *ž+é*[?] *his*, *her clothes* (respect), *č'lbē*[?] *crab*, *y'zà*[?] *cherry*. Vowel lengthening operates in conjunction with the rule that lengthens fortis consonants following a stressed vowel to maintain a fairly constant length for stressed syllables. If both fortis consonants and all vowels are considered to be long in the underlying form, a single left-to-right iterative rule that shortens any segment that precedes a long segment yields the correct phonetic output for monosyllabic CVC words. It shortens fortis consonants before vowels and shortens vowels before fortis consonants, leaving them long before lenis consonants. Such a rule would, however, need some modification to handle consonant clusters, and a further rule would be needed to shorten all segments in unstressed syllables.

When a laryngealized vowel is followed by *n* in the same syllable, a syllabic *n* serves as a portmanteau realization of the second mora of the vowel and the following *n*: *'bén+č'čé*[?] *her husband* (respect), *y'in* *chile*. A fortis nasal in the onset of the following syllable also realizes the second mora of the vowel: *ž'jin'+ò*[?] *your child*. Because of the similarity of the phonetic output to a *V[?]n* sequence, we considered such an analysis as an alternative to this rule, but rejected it on the grounds of morphophonemics and native reaction. When a root ending in *VV* takes the *-n* *third-person inanimate* suffix, the result is the above portmanteau; roots ending in *V[?]* may not take this suffix, but must instead occur in a longer construction. In addition, native speakers who have learned to read CZ identify this sequence as *VVn* rather than *V[?]n*.

Vowel clusters are not permitted in CZ; automatic rules adjust vowel sequences across morpheme boundaries.

A sequence of two like vowels reduces to one. Because of the resulting tones and because of the rules below, we consider that the first vowel is lost. Examples: $\check{z} + y\grave{a}$ *rifle of* + \grave{a}^2 *my* → $\check{z} + y + \grave{a}^2$ *my rifle*, $\check{s} + t\grave{o}$ *string of* + \grave{o}^2 *your* → $s + t + \grave{o}^2$ *your string*.

A high vowel becomes the corresponding semivowel preceding an unlike vowel: $\check{s} + t\grave{o}$ *string of* + \grave{a}^2 *my* → $\check{s} + tw + \grave{a}^2$ *my string*.

A low vowel is deleted preceding an unlike vowel: $\check{s} + \acute{a}$ *father of* + \acute{e}^2 *his* (respect) → $\check{s} + \acute{e}^2$ *his father*. Note also the loan words *r'fêl Rafael* (name) and *ism'êl Ismael* (name).

When the first vowel is checked or laryngealized, the resulting form usually takes the checking or laryngealization of the first vowel and the oral quality of the second: $l\check{o}^2$ *chest of* + \grave{a}^2 *my* → $l\check{c}w + \hat{a}^2$ *my chest*, $\check{z} + \acute{e}l'ée$ *banana of* + \acute{e}^2 *his* (respect) → $\check{z} + \acute{e}l' + \acute{e}e$ *his banana*, $\check{z} + \acute{e}l'ée + \grave{a}^2$ *my* → $\check{z} + \acute{e}l' + \hat{a}a$ *my banana*.

Simple vowels occur in both open and closed syllables: $n\grave{i}$ *here*, $d\grave{o}$ *string*, $y\grave{i}c$ *paper*, $y\grave{e}h$ *hole*. They may occur in syllables at any position in a morpheme or word: $z\grave{o}m'é$ *basket*, $bz\grave{o}R\acute{e}$ *bumblebee*, $\check{j} + \grave{a}^2y\grave{o}lé + n$ *it is turning off*, $\check{j} + \acute{a}^2b\grave{a}ni + n\acute{e}$ *he is amazed* (respect).

Checked vowels occur only in open syllables. Only one checked vowel may occur per root, and it must be in the final syllable: $y\acute{i}z\grave{a}^2$ *cherry*, $\check{c}\acute{i}b\acute{e}^2$ *crab*. In polymorphemic words, a checked vowel may occur in a nonfinal syllable, or two checked syllables may occur: $\check{j}\acute{a}^2 + l\acute{e}$ *above it*, $\hat{y}\acute{a}^2 + \hat{n}\acute{a}^2$ *patio*.

Laryngealized vowels occur in both open and closed syllables: $y\acute{o}o$ *quicklime*, $b\acute{i}i$ *this morning*, $d\acute{a}a$ *palm mat*, $\check{z}\acute{i}in'$ *child of*, $\check{s}\acute{a}ag$ *town errand boy*, $l\acute{e}eR$ *fence*. It is

somewhat rare for more than one laryngealized vowel to occur in a root, or for a laryngealized vowel to occur in a nonfinal syllable. It is perhaps the case that such words are compounds for which we have not yet been able to identify the source. Examples of roots: $y\acute{e}c\acute{e}e$ *thorn*, $t\acute{i}r\acute{o}c\acute{e}e$ *hummingbird*. Examples of clear compounds: $\hat{y}\acute{a}a + \hat{s}t\acute{i}l$ *soap* ($\hat{y}\acute{a}a + \hat{s}t\acute{i}l$ *Spanish*, from Sp. Castilla), $\hat{b}\acute{e}n'áa + \hat{y}\acute{o}$ *man*. Examples of probable compounds: $l\acute{i}i + \check{s}\acute{o}p$ *Laxopa* (town) ($\check{s}\acute{o}p$ *six*), $\hat{y}\acute{b}\acute{y}\acute{a}a + \hat{l}z\acute{e}R$ *mushroom* ($\hat{y}\acute{b}\acute{y}\acute{a}a$ *fungus*). Examples of possible compounds: $b\hat{l}'\acute{a}a\check{s}\acute{h}\acute{a}a$ *Mexican jay*, $b\acute{e}d\acute{a}acR\acute{e}$ *Betaza* (town), $n\acute{o}ol\acute{e}$ *woman*.

It is rare for a vowel to occur syllable-initially; with few exceptions, examples of initial vowels found to date occur in affixes or in Spanish loan words: iz *year*, $\acute{e}s$ *fathom*, $\grave{a}g\acute{a}$ *not*, $\acute{e}-$ *question marker*, *future aspect*, $\hat{a}\check{z}$ *garlic* (Sp. ajo), $\acute{o}r$ *gold* (Sp. oro). A corollary of this fact is that there are no sequences of two vowels (V_1V_2), except for the two morae of laryngealized vowels (V_1V_1). When two vowels come together at a morpheme boundary, one is dropped or becomes a semivowel, as described above. This restriction on vowel sequences applies to checked and laryngealized vowels as well as simple vowels. It is thus possible to have a $V_1^2CV_2$ sequence, but not a $V_1^2V_2$ one, and to have a $V_1V_1CV_2$ sequence, but not a $V_1V_1V_2$ one.

Only one restriction on the occurrence of a consonant contiguous to a vowel has been found to date. The vowel *a* does not precede *y* in the same syllable; note the loan words *r'êy line* and *m'êy May*, from Sp. *raya* and *mayo*, respectively. The sequence is permitted, however, when *y* is the onset of a following syllable: $b\acute{a} + y\acute{a}g$ *male animal*, $b\acute{a} + y\acute{e}l' + \acute{e}$ *big animal*.

3. CZ has both contrastive stress and

lexical tone. Although vowel and consonant length is a perceptually salient feature of CZ, it is not contrastive, but rather conditioned by stress placement and by the occurrence of fortis and lenis consonants. In this section we treat stress first and then tone.

Stress placement is contrastive in surface forms because it cannot be predicted without access to morphological information. In native roots, however, it is predictable. Primary stress (ʷ) falls on the penult of a polysyllabic root that ends in V or VV; in all other words it falls on the ultima: ʷʒwágé *pitcher*, ʷbál'é *some*, ʷbèyée *ice*, ʷčítèe *cross-eyed*, ʷdò *string*, ʷyóo *quicklime*, číʷbēʔ *crab*, yíʷzàʔ *cherry*. It is difficult to find two-syllable native roots that end in a consonant; all words with this pattern are probably old compounds or Spanish loan words. Such words do, however, follow the above rule and have stress on the ultima: kóʷriš *cabbage* (Sp. coles or Sp. col + yíš *weed*), wèe + ʷžib *roadrunner*, xósʷtís *authority* (Sp. justicia). In a three-syllable root (or old compound) with primary stress on the ultima, a secondary stress (ʷ) falls on the antepenult: ʷgòcRòʷžòon *bird spider*.

When affixes are added to roots, the root retains its original stress pattern. When a suffix consisting of a single consonant is added to a root ending in V or VV, for example, the primary stress remains on the penult: ʷzíšè + n *it is sweet*, ʷòzè + b *animal horn*, ʷgèyèe + b *five animals*. Note also ʷyít + àʔ *the squash*, which contrasts in stress placement with yíʷzàʔ *cherry*. When a suffix comprising a syllable is added to a root with primary stress on the penult, the primary stress then falls on the antepenult of the word, in which case secondary stress occurs on the ultima: ʷ + ʷlájèe + ʷbée *his clothes* (familiar), ʷl'óžèe + ʷjóo *our tongue*.

Compounds show more complex stress

patterns. Although the analysis is not complete, we have observed the following patterns. Compound nouns whose source was a head-modifier phrase show primary stress on the second part (the modifier) and secondary stress on the first part (the head): ʷbèyèe + ʷdè *frost (ash ice)*, ʷbèš + ʷyíž *ground cherry* (*Physalis* sp.) (*grass tomato*), ʷnìs + ʷdòʔ *ocean (big water)*, ʷyíšR + ʷdòʔ *hammock (large bag)*, ʷbèjR + ʷbnàʔ *female turkey*, ʷbèš + Ròʷniʔ *scorpion (? tick)*. Compound nouns whose source was a possession phrase may show primary stress on either the first part (the possessed item) or the second part (the possessor): ʷž + ʷnèz + ʷnìs *ditch (the water's path)*, ʷšàn + ʷyô *landowner*.

Some function morphemes, such as *dii that which (is)*, never receive primary stress when they occur in a compound and receive secondary stress only in cases where it would be assigned automatically because it is two syllables away from the primary stress: *dii + ʷcíc white stuff*, ʷyà + *dii + ʷjácR rifle (iron that bursts)*, ʷdii + *m'ó'rád purple stuff* (Sp. morado). Other function morphemes, such as *wà person who*, take secondary stress: ʷwà + ʷčìžRé *tax collector*, ʷwà + ʷsèd *learner*, ʷwà + z + èeʷniʔ *lightning bug*.³

In recent Spanish loan words, stress falls on the syllable that contains the stressed vowel of the source: *kál'fê coffee*, *m'á'nyá hobble* (Sp. manea).

In this article, we have written stress only in words in which it is not predictable or where stress is relevant to the discussion.

There are no systemic restrictions on the occurrence of consonants and vowels in stressed and unstressed syllables. Checked

³ It is possible that those words we have treated here as compounds having secondary stress are better treated as phrases, in which case our primary stress is phrase stress, and our secondary stress is word stress that does not coincide with phrase stress.

vowels rarely occur in unstressed syllables, and laryngealized vowels rarely occur in stressed syllables, but this results from the fact that the syllable type conditions the stress and the fact that checked and laryngealized vowels occur only once in simple roots.

There is a clear contrast in CZ among high tone, low tone, and a downglide from high to low. There is also a mid tone which contrasts with the others in limited environments, yet appears to pattern as a variant of high in other environments, and of glide in still others.⁴

In monosyllabic roots with open simple vowels, simple vowels closed by either a fortis or lenis consonant, or checked vowels, there is contrast only among high (ˊ), low (ˋ), and glide (ˆ): wí *guava*, nì *here*, yá *vapor bath*, yà *rifle*, yâ *bamboo*, zá *lard*, zà *beans*, dám *owl*, bèl *snake*, bêl *fish*, lís *smooth*, nìs *water*, yít *squash*, yèt *tortilla*, bíd *chile seed*, bìd *bedbug*, číR *house wren*, bèR *water hole*, bêR *cloud*, m'ál *comother* (Sp. *comadre*), yàl *incense*, wâl *strong*, náʔ *there*, bèʔ *wind* (noun), žwâʔ *corn*. This contrast is weakest preceding fortis consonants; in native words there is a tendency for high tone to occur preceding a fortis stop or affricate and low tone to occur preceding a fortis sibilant. Glide is rare preceding a fortis consonant. The contrast is also somewhat

⁴ Some older speakers also have an upglide (ˆ) on some words ending in a simple vowel: zà *beans*, yà *rifle*, yon. Younger speakers pronounce such words with low tone, suggesting either a recent merger of upglide with low or the recent loss of an allophonic rule. This article is based on the dialect of younger speakers, but we mention the other dialect for its historical interest. In other cases also, more than one tone has been recorded on a single morpheme, and different patterns of tonal replacement have been observed for different speakers. These differences do not hinder communication, however, because tone appears to carry a low functional load in CZ.

weak on checked vowels because they are less common than the other vowel series.

In monosyllabic roots with laryngealized vowels, there is a four-way contrast: both morae may have high tone, both low tone, the first high and the second mid, or the first high and the second low. The high-high pattern is rare. In that laryngealized vowels have been analyzed as single segments, one way of handling these contrasts is to match up these patterns with the four tones that contrast elsewhere; high-mid can be considered a variant of mid (-). A second possibility is to consider that for the purposes of tone distribution, laryngealized vowels are two segments that serve as the complex nuclei of single syllables. In this case, only four out of a possible sixteen patterns occur. Because in whistled speech the high-high, low-low, and high-low patterns are indistinguishable from the high, low, and glide patterns, respectively, that occur on simple and checked vowels, we have chosen the first solution and write tone only on the first mora. The high-mid pattern shows a definite downglide in whistled speech and is thus distinct from the level mid found elsewhere, but we have chosen to consider it a variant of mid rather than posit a fifth contrastive tone. Examples: yóo *quicklime*, yàa *plaza*, bìi *person who*, bìi *this morning*.

In two-syllable roots, the patterns high-high, high-low, low-high, and low-low are common in native roots: zóm'é *basket*, yízàʔ *cherry*, bèlée *meat*, gònée *mud*. The pattern high-glide occurs occasionally on what appear to be native morphemes, and it is common in loan words: žRásyâ *Xagacia*, bártôl *Bartolo* (name). The patterns glide-high, glide-low, and glide-glide occur occasionally on what appear to be native morphemes: n+âléé *is hanging* (older speakers), žílée *sheep* (but note žílee *cotton*), bègèe *squash gourd*, n+âléé *is hanging* (younger speakers). Other

patterns with glide occur only on words containing more than one morpheme.

A mid tone also occurs on the second syllable of a two-syllable root following high tone; only two examples have been found to date: kóriz *squirrel*, číbē[?] *crab*. Mid does not occur elsewhere in polysyllabic morphemes.

The limited contrast of mid with high in two-syllable roots is almost certainly to be explained as a recent example of phonemic split caused by loan words. Native words with a high-high tone pattern have either a simple open vowel or a laryngealized vowel in the second syllable, while the two examples of high-mid show a checked vowel in one and a simple closed vowel in the other. The word with a simple closed vowel may be a Spanish loan word, but if so, it appears to be fairly old. Recent Spanish loan words, on the other hand, often have a high-high tone pattern on a word with a closed vowel, as in xóstis *authority* and kólántr *coriander* (Sp. culantro).

The development of mid in laryngealized vowels may also be a recent innovation, but it cannot be parallel to the development of mid in two-syllable roots following high, because words with laryngealized vowels are never Spanish loan words. We are at present unable to offer any hypothesis concerning its origin.

Although much remains to be done in the analysis of CZ tone, and a number of tonal replacements are components of inflectional morphemes, at least the following regular rules apply to tone.

Following low or glide, high tone is actualized as mid, and glide is actualized as a mid-low glide: bzòRé *bumblebee*, tíròcéé *hummingbird*, lôo + lé *inside it*, bà + sêr *honeybee* (bà + Sp. cera), wèe + žib *roadrunner*, ⁿn + âl'êe + n *it is hanging*. This rule codifies one manifestation of a general downdrift within the phrase.

On a checked vowel, glide is actualized as mid for some speakers and as a high-mid glide for others. Such words are whistled with a full high-low glide. Examples: l' + ê[?] *him, her*, lâ[?] *Oaxaca*, 'yét + ⁿgô[?] *tamale*.

On a laryngealized vowel, mid is actualized as a high-mid glide: bii *this morning*, z + âa *I'm coming*. Although whistled as glides, both the high-mid variant of mid and the glide tone are perceived as a sequence of two level tones on laryngealized vowels.

An unstressed vowel with low tone is optionally devoiced phrase-finally: bèn'âa + yò *man*, r + séd + âa *my salt*.

One regular morphophonemic rule is that high becomes glide before -b *animal marker* and -n *third-person inanimate*: žá *skin of*, žâ + b *animal skin*, n + âl'êe *is hanging*, ⁿn + âl'êe + n *it is hanging*. The phonetic mid tone that occurs after low and glide also undergoes this rule, which is one reason we have grouped it with high, as in n + âl'êe above. To date we have discovered no examples of the contrastive mid that can occur with either of these suffixes; we therefore do not know whether this rule would apply to them.

No automatic tone sandhi has been found to date. Except for glide-glide, all combinations of high, low, and glide occur across morpheme boundaries: š + tit + jóo *our ticklishness*, r + 'sógó + ⁿčé[?] *his great-grandchild* (respect), 'bíč + ⁿčyâ *acorn*, 'žâ + ⁿlók *quick temper* (žâ + Sp. loco), 'liž + ⁿyâ *jail*, 'byò[?] + ⁿwâl *full moon*, žib + jóo *our knee*, 'žiin + ⁿyâ *key*. No word containing a sequence of two morphemes with basic glide tone has been found to date, but a sequence of two glide tones is permitted within a word, as in ⁿn + âl'êe + n *it is hanging*. Mid has a restricted distribution; it has been found to date only in a few of the possible combinations with other tones: dâa + ⁿbii *this morning* (full form), bii + zî *just this morning*.

Tone and stress are to a large degree independent of each other. High and low occur on syllables with primary stress, syllables with secondary stress, and unstressed syllables: ʰčópé *two*, $\text{ʰbíč} + \text{ʰčyâ}$ *acorn*, ʰgònèe *mud*, $\text{ʰbèš} + \text{ʰyîž}$ *ground cherry*. Glide occurs almost exclusively on syllables with primary stress because of its restricted distribution in polysyllabic words, but there are occasional rare exceptions: $\text{ʰyét} + \text{ʰgô}^?$ *tamale*, $\text{ʰžib} + \text{ʰjóo}$ *our knee*; but $\text{ʰn} + \text{ʰâl'êe} + \text{n}$ *it is hanging*, $\text{ʰgô} + \text{ʰlis}$ *small potato*. Mid occurs only on syllables with primary stress because of its limited distribution: $\text{kó}^{\text{r}}\text{riz}$ *squirrel*, ʰbi *this morning*.

4. It would be possible to interpret $V^?$ and VV as sequences of simple vowel plus lenis and fortis glottal stop, respectively. The rearticulation in VV would substitute for the lengthening of other fortis consonants. In favor of such an analysis is the fact that stressed checked vowels are lengthened, which parallels lengthening before lenis consonants. Also in favor is the fact that no postvocalic consonants are permitted following $V^?$, and a restriction on the complexity of consonant clusters seems somewhat more natural than an arbitrary restriction between consonants and vowels. Against such an analysis, however, are two fairly strong considerations. One is that glottal stop does not occur prevocally, and intervocally it does not serve as a sufficient consonantal barrier between vowels. Sequences of $V_1^?V_2$ and $V_1V_1V_2$ ($V_1^?V_2$) are not permitted, which is parallel to the restriction against sequences of V_1V_2 . These restrictions make $^?$ and $^?$ seem unlike consonants. A further argument against treating $^?$ and $^?$ as consonants involves stress placement. Laryngealized vowels usually occur on unstressed syllables, and it would require more complex rules to

produce the correct surface form if $^?$ is considered to be a consonant. For these reasons, we prefer to combine the laryngeal components with vowels to create three distinct series of vowels, rather than treating them as consonant phonemes with defective distribution.

Another alternate interpretation is to consider fortis consonants to be underlying geminate clusters. Three pieces of evidence point away from such an interpretation. One involves the length of consonant clusters. If fortis consonants were underlying geminates, clusters such as those in $\text{št} + \text{IRšiz}$ *even San Francisco Cajonos* and $\text{št} + \text{ž} + \text{bsy} + \text{ê}^?$ *even his hawk (respect)* would have eight and nine members, respectively, in their underlying structure (šštIRšš and šštžšpsy), which seems unlikely. A second reason is that when two identical lenis consonants come together across morpheme boundaries, they do not result in a fortis consonant; $\text{ž} + \text{m'êj} + \text{jóo}$ *our money* contains a sequence of two lenis affricates, not a single fortis one. The third is that native speakers who have learned to write CZ have never tried to indicate fortis consonants by doubled symbols. In the case of sonorants, the analysis of fortis consonants as geminate clusters has more validity; but it seems better to treat all fortis consonants alike because they behave alike with respect to lengthening rules.

It would be possible to consider kw a labialized velar unit, rather than a cluster, and historically, this was undoubtedly the case. One piece of evidence that favors such an interpretation is the fact that the w is devoiced following k and preceding a voiced consonant: cikwlát *chocolate*, $\text{žikw} + \text{nidèe} + \text{jóo}$ *our armpit*. In addition, a w following k (and g in loan words) is pronounced with less syllabicity than a w following other consonants: $\text{ž} + \text{lákwi} + \text{n}$ *its bark (tree)*, $\text{dwá}^?$ *maguay*, $\text{žwâ}^?$ *corn*.

There is, however, no contrast between them. We have not made kw a unit because the parallel gw sequence occurs only in loan words and because there are many other sequences of an obstruent followed by a semivowel. It is unlikely that all are units because some occur in only a few morphemes, and we preferred to treat all such sequences alike.

5. Spanish words have been incorporated in CZ for the past four centuries. At least two strata can be recognized; older loans show more extensive adaptation to CZ phonology than do more recent loans. In this section, we present some of the major correspondences.

In older loans, a lenis stop sometimes substitutes for a Spanish voiceless stop: béy *sash* (pañó), béd *Pedro*. In one word, Spanish d followed by nonsyllabic i became CZ j: m'êj *money* (medio). An alveolar affricate substitutes for the Spanish alveopalatal affricate in early loans: cíb *goat* (chivo), m'éc *wick* (mecha). The palatal feature of this affricate in the source word is sometimes reflected by a shift in the prestressed vowel: cím'âr *blanket* (chamarra), cíkwlát *chocolate* (chocolate). The lenis retroflex sibilant substitutes for the Spanish velar fricative in early loans; this sound probably had an alveopalatal articulation in the sixteenth century: žwâ *Juan* (name), âž *garlic* (ajo). In a few examples, š or ž substitutes for Spanish s: št *until* (hasta), žm'ân *week* (semana), perhaps kóriš *cabbage* (coles or col + yiš *weed*). Spanish ñ appears as CZ y in older loans: béy *sash* (pañó). Spanish r and l sometimes replace each other: m'ál *comother* (comadre), kóriš *cabbage* (coles or col + yiš *weed*). In one word, Spanish rr appears as CZ r: cím'âr *blanket* (chamarra).

In more recent loans, Spanish obstruents become their nearest CZ counterparts: pát *duck* (pato), l'ád *Eladio*, léč *milk* (leche),

sít *hair oil* (aceite). The Spanish velar fricative has been introduced into CZ as a new phoneme via recent loans: ráx *slice* (raja), xóstís *authority* (justicia). Spanish ñ enters CZ as a yn cluster in recent loans: m'êyn *naughtiness* (maña). Spanish liquids become their nearest CZ counterparts: m'êr *almost* (mero), syêr *saw* (sierra), wêl *Manuel*.

Stressed vowel correspondences are fairly regular, with both o and u of Spanish entering CZ as o: síy *chair* (silla), léč *milk* (leche), kóc *pig* (cuchi), bót *vote* (voto), pát *duck* (pato). Spanish a becomes e before y in the same syllable to conform to a general constraint of CZ: r'êy *line* (raya), m'êy *May* (mayo), béy *sash* (pañó), m'êyn *naughtiness* (maña). Vowel sequences containing a stressed vowel drop one of the vowels or change one into a semivowel; as a result, the stress often shifts in such words: tyâ *aunt* (tía), ryó *cricket* (grillo), m'á'nyâ *hobble* (manea), sít *hair oil* (aceite).

Poststressed vowels of Spanish words are usually lost: léč *milk* (leche), pát *duck* (pato), m'éc *wick* (mecha). Final o following a velar stop is retained as w: bánkww *bench* (banco), gríngww *light-skinned foreigner* (gringo).

Prestressed vowels are also sometimes lost, but not consistently. Examples of vowels lost: lséns *license* (licencia), gárbát *wooden hook for pack animal* (garabato), bsít *kiss* (besito), cíkwlát *chocolate* (chocolate) (with w substituting for the lost vowel). Examples of vowels retained: xóstís *authority* (justicia), cím'âr *blanket* (chamarra), kál'fê *coffee* (café), séríy *match* (cerillo).

Loan words that come into CZ as monosyllables ending in a fortis obstruent take high tone: pát *duck* (pato), léč *milk* (leche), róx *Rogelio* (name). Monosyllables ending in a sonorant or lenis obstruent usually take glide, but sometimes take high tone: m'êy *May* (mayo), žm'ân *week* (semana), syêr' *saw* (sierra), tráz *peach* (durazno);

but béy *sash* (pañó), žwán *Juana* (name),
pén *almost* (apenas).

Prestressed syllables in loans take high
tone: kál'fê *coffee* (café), cím'âr *blanket*
(chamarra), xóstís *authority* (justicia).

Some loan words show idiosyncratic

correspondences; two examples are: m'râž
orange (naranja), with m' substituting for
the first n and loss of the second, and
žnékw *rabbit* (conejo), with metathesis of
the first and last consonants of the source
word.