A Huave vowel epenthesis

(1) Two kinds of epenthetic vowels in Huave (isolate; Oaxacan coast, Mexico).

Question: How do they get their features?

• In suffixes:
  a. t-a-rang-as  
    CPL-TV-make-1
    ‘I did/made it’
  b. t-a-mong-os  
    CPL-TV-pass-1
    ‘I passed (it)’
  c. t-a-jing-as  
    CPL-TV-dance-1
    ‘I danced’

• In the passive infix -rV(j)- (precedes root-final consonant; CVC -> CV.rV.C):
  d. t-a-xu.ru.m  
    CPL-TV-find.PASS
    ‘It was found’
  e. t-a-xe.re.ng  
    CPL-TV-raise.PASS
    ‘It was raised’
  f. t-a-nde.ra.k  
    CPL-TV-speak.PASS
    ‘It was spoken’

(2) Background - what features (approximately) exist in the language. Inventory:

• Vowels: /i e a o u/

• Consonants:

<table>
<thead>
<tr>
<th></th>
<th>Labial</th>
<th>Coronal</th>
<th>Velar</th>
<th>Labiovelar</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stops</td>
<td>p mb</td>
<td>t nd</td>
<td>k ng[n]</td>
<td>kw ngw[ngw]</td>
<td></td>
</tr>
<tr>
<td>Affricates</td>
<td></td>
<td>ts nts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fricatives</td>
<td>f[ɸ] s</td>
<td></td>
<td>j[h]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nasals</td>
<td>m n</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquids</td>
<td>l r[r] rr[r]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glides</td>
<td>w j</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• All consonants come in plain and palatalized versions (/C^bk/, /C^pal/)  
  o Palatalization as secondary/abstract (no POA change): All non-coronal and rhotics
    (exception: ng^pal optionally realized as ñ word-finally)
  o Palatalization in inherent place: Non-rhotic coronals

<table>
<thead>
<tr>
<th></th>
<th>t</th>
<th>nd</th>
<th>l</th>
<th>ts</th>
<th>nts</th>
<th>s</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(3) Epenthetic vowels get their features partly from preceding-syllable vowels, and partly from neighboring consonants. Underlying phonemes for roots in (1):

a. rang^bk -> a  
b. mong^bk -> o  
c. jing^bk -> a  
d. xum^bk -> u  
e. xeng^pal -> e  
f. ndek^bk -> a
At first glance, suffix and infix harmony appear to follow identical patterns, aside from a mysterious morpho-phonological gap with the (non-productive) infix:

- Root-final consonant exert influence in different directions in the two processes.
- To what extent is a unified analysis possible?

Suffix (infix) harmony: summary

<table>
<thead>
<tr>
<th>Preceding V</th>
<th>Epenthetic V</th>
<th>Final C</th>
<th>Preceding V</th>
<th>Epenthetic V</th>
<th>Final C</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>a (a)</td>
<td>C_bk</td>
<td>i</td>
<td>i (i)</td>
<td>C_pal</td>
</tr>
<tr>
<td>e</td>
<td>a (a)</td>
<td>C_bk</td>
<td>e</td>
<td>e (e)</td>
<td>C_pal</td>
</tr>
<tr>
<td>a</td>
<td>a (a)</td>
<td>C_bk</td>
<td>a</td>
<td>i (N/A)</td>
<td>C_pal</td>
</tr>
<tr>
<td>o</td>
<td>o (o)</td>
<td>C_bk</td>
<td>o</td>
<td>i (N/A)</td>
<td>C_pal</td>
</tr>
<tr>
<td>u</td>
<td>u (u)</td>
<td>C_bk</td>
<td>u</td>
<td>i (N/A)</td>
<td>C_pal</td>
</tr>
</tbody>
</table>

Claims:

- Both harmony patterns arise from the interaction of a vowel copy process with the “influence” of plain vs. palatal features on consonants
- But this “influence” may be of different kinds in the two processes
- Infix harmony: Feature realization (MAX)
- Suffix harmony: Constraints on CV transitions

Structure of talk:

- Independent motivation for CV Transition constraints - phonotactics
- Independent motivation for Feature Realization constraints - diphthongization
- How feature realization and Vowel Copy interact to produce infix harmony
- How CV constraints and Vowel Copy interact to produce suffix harmony
- Why one is not the other and why they are not the same thing

B CVC phonotactics

Morpheme-initially, palatalization is not contrastive. For non-rhotic coronals, it is allophonic.

a. xijk ‘cigar’
   b. xex ‘bowl’
   c. xur ‘pot’
   d. *ti, *li, *ni, *si, *tsi...

Morpheme Structure Constraint: palatalization of coronals before /i e u/ (front & high Vs)

<table>
<thead>
<tr>
<th>i</th>
<th>g</th>
<th>u</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. tyim</td>
<td>ety 'father'</td>
<td>i. tyum 'throat'</td>
</tr>
<tr>
<td>b. lylly 'fish scale'</td>
<td>f. kandyely 'candle'</td>
<td>j. chuk 'ant'</td>
</tr>
<tr>
<td>c. fiity 'palm (tree, leaf)'</td>
<td>g. fnchew 'stupid'</td>
<td>k. fnjty 'thief'</td>
</tr>
</tbody>
</table>

Alternations: palatalization as an active process. Valence-decreasing theme vowel u:

a. n- a- ty
   1SB TV eat
   ‘(that) I eat (it)’

b. ñ- u- ty
   1SB TV eat
   ‘(that) I eat’ (itr.)
c. **t- a- ñchum**
   CPL TV stain
   ‘s/he stained (it)’

d. **ty- u- ñchum**
   CPL TV stain
   ‘it was stained’

(10) On the other hand, onset rhotics, labials, velars, and [h] (“j”) do not have palatal offglides (most clear in the [u] context; Suarez 1975). This is true as a morpheme structure constraint...

<table>
<thead>
<tr>
<th>a. <strong>kily</strong> ‘parrot’</th>
<th>d. <strong>kej</strong> ‘blood’</th>
<th>g. <strong>kuj</strong> ‘metate’</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. <strong>mily</strong> ‘lisa fish’</td>
<td>e. <strong>mbex</strong> ‘fingernail’</td>
<td>h. <strong>nguyngu</strong> ‘turtledove’</td>
</tr>
<tr>
<td>c. <strong>jiw</strong> ‘breast’</td>
<td>f. <strong>jely</strong> ‘clothing’</td>
<td>i. <strong>rruy</strong> ‘buluxio fish’</td>
</tr>
</tbody>
</table>

(11) ...And, in the u-theme context, these segments do not acquire a palatal offglide.

<table>
<thead>
<tr>
<th>a. <strong>m- a- ty</strong></th>
<th>b. <strong>m- u- ty</strong></th>
<th>c. <strong>m- e- r- u- ty</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>SB TV eat</td>
<td>SB TV eat</td>
<td>SB 2 2TR TV eat</td>
</tr>
<tr>
<td>‘(that) s/he eats (sthg)’</td>
<td>‘(that) s/he eats’</td>
<td>‘(that) you (sg.) eat’</td>
</tr>
</tbody>
</table>

(12) Another example: Diminutivization raises all root vowels to [+high], taking e.g. [o] to [u]. When this happens, preceding coronals palatalize, but non-coronals don’t.

<table>
<thead>
<tr>
<th>Aug.</th>
<th>Dim.</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. <strong>son</strong>ong</td>
<td>b. <strong>xun</strong>ung ‘to pile up’</td>
</tr>
<tr>
<td>c. <strong>sop</strong>op</td>
<td>d. <strong>xup</strong>up ‘to drizzle’</td>
</tr>
<tr>
<td>e. <strong>koñ</strong></td>
<td>f. <strong>kuñ</strong> ‘to fold’</td>
</tr>
</tbody>
</table>

(13) Although there is no palatalization contrast in onsets, there is in codas (=word-finally).

| a. n-a-**ngan** ‘sugar’ | b. n-a-**ngañ** ‘drunk’ |
| NOM-TV-sweet | NOM-TV-drink |
| c. a-**m** ‘s/he goes’ | d. a**im** ‘s/he dreams’ |
| TV-go | TV-dream |

(14) Argument #1 in favor of analyzing (13cd) as a final-C contrast: Falling diphthongs are only ever found before non-coronals (i.e. Cs which cannot realize palatalization inherently), never before coronals.

|--------------------------------------------|

(15) Argument #2 in favor of analyzing (13cd) as a final-consonant contrast: When suffixes are added to a root with a ui, oi or ai diphthong, the palatal offglide disappears; the palatalization manifests itself in the front status of the epenthetic vowel introduced by the suffix.

<table>
<thead>
<tr>
<th>a. /i-lak\textsuperscript{pal}/ i-<strong>laik</strong> ‘your tooth’</th>
<th>b. /i-lak\textsuperscript{pal}-i-in/ i-<strong>lak-ion</strong> ‘your (pl.) teeth’</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-tooth</td>
<td>2-tooth-PL</td>
</tr>
<tr>
<td>c. /a-long\textsuperscript{pal}/ a-<strong>loing</strong> ‘s/he hangs it’</td>
<td>d. /a-long\textsuperscript{pal}-i-f/ a-<strong>long-iuf</strong> ‘they hang it’</td>
</tr>
<tr>
<td>TV-hang</td>
<td>TV-hang-3PL</td>
</tr>
</tbody>
</table>
In sum:
- Palatalization is contrastive only morpheme-finally. (i.e. in codas, which are only ever found word-finally.)
- Onset palatalization is allophonic for coronals, with C<sup>bk</sup> before /a o/ and C<sup>pal</sup> before /i e u/.
- Initial non-coronals show no evidence of distinguishing front and back variants at all.

C  Diphthongization as feature realization

Observation: in all diphthongs, the latter part of the vowel usually cues the “back” (plain) or “front” (palatal) status of the coda consonant.

Falling diphthongs ai, oi, ui occur in syllables with underlying back vowels; the palatal offglide cues palatality (“frontness”) of the final consonant.

a. /u- lak<sup>pal</sup>/  u-laik ‘his/her tooth’  c. /puk<sup>pal</sup>/  puiik ‘feather; fur’
b. /a-long<sup>pal</sup>/  a-loing ‘hang, 3sg.’  d. /ok<sup>pal</sup>/  oik ‘cloud’

Diphthongization is observed only when underlying vowel-coda consonant sequences conflict in frontness/backness. When the vowel and coda consonant already match for frontness or backness, no diphthongization occurs.

Front V + Front C  Back V + Back C
a. /mi<sup>pal</sup>/  mily ‘lisa fish’  c. /kants<sup>bk</sup>/  kants ‘chile’
b. /s<sup>espal</sup>/  xex ‘bowl’  d. /ndok<sup>bk</sup>/  ndok ‘fishing net’

Rising diphthongs io [ja, jo] and ia [ja] occur in syllables with underlying front vowels; the central/back nucleus cues plainness (“backness”) of the final consonant.

a. /iC<sup>bk</sup>/  ----> ioC  b. /eC<sup>bk</sup>/  ----> iaC
 /miC<sup>bk</sup>/  miok ‘bat’  /pets<sup>bk</sup>/  piats ‘tortilla’

Argument #1 in favor of analyzing (20) as a final-consonant contrast: Rising diphthongs io and ia never occur before (inherently) palatalized consonants, only before non-coronals and plain coronals.

Argument #2 in favor of analyzing (20) as a final-consonant contrast: Rising diphthongs alternate with front-vowel monophthongs upon resyllabification (“back” consonants also select back vowels for vowel harmony as in (22b)).

a. /a-jir<sup>bk</sup>/  a-jiør ‘has’  b. /a-jir<sup>bk</sup>-af/  a-jir-af ‘they have’
TV- have  TV- have-3PL

c. /t-e-t<sup>pal</sup>/  t-e-ty ‘you ate (it)’  d. /t-e-m<sup>bk</sup>/  t-ia-m ‘you went’
CPL-2-eat  CPL-2-go
(24) Exception to the VC-matching generalization:
Back V + Front C  
Inherent palatals: no fission despite the back-vowel environment
a. /kat^{pal}/  katy ‘fish’ *kaity
b. /mas^{pal}/  max ‘canoe’ *maix

(25) The generalization that “the second half of the vowel realizes the front vs. back status of the final consonant” is not really correct.
• Correct generalization: The underlying front vs. back status of the final consonant must be realized on the surface. In most cases, it is realized on the preceding vowel; this is the source of all diphthongs.
• But with inherently palatal consonants, it is realized on the consonant itself; there is no need to realize it on the preceding vowel as well.

(26) How do we distinguish between coarticulation and diphthongization with final palatals, given that some degree of coarticulation is inevitable?

(27) True diphthongs (left) reach a steady state for both components - two distinct targets. Back vowels before palatal coronals (right) show a more linear transition that suggests coarticulation.

(28) Interestingly, the palatalization contrast only obtains in a position where it is difficult to perceive (Kochetov 2002). The historical explanation lies in the loss of final vowels.

(29) Diphthongization can be understood diachronically as the phonologization of V-to-V coarticulation upon final vowel loss (Suarez 1975). Final vowels thus left their front/back stamp on both preceding Cs and preceding Vs; this is behind the VC “matching” seen in (18) and (20).

a. Front vowels: *ndéka > *ndé^{c}ka > *ndé{a}k > *ndé{a}k > ndjak
b. Back vowels: *-l{a}ki > *-l{a}^{i}ki > -lajk

(30) Some of the hypothesized intermediate stages in (29a) are attested in other Huave dialects. The presumably longer duration of stressed vowels (the only ones which diphthongize) could have contributed to perception of the offglide as a distinct phase.

(31) Coronal consonants acquired palatal place of articulation before front vowels. That is, the (historical) final vowel’s front/back status was phonologized on the consonant itself. Palatal coarticulation on the vowel remained predictable, and phonetic.

*kat{i} > *ka{t}^{pal}i > kat{pal}
Loanword evidence

a. CVCi, CVCe > CVC\pal
b. Sp. melón ‘melon’ > PHu. *meloni > Hu. meloñ

c. CVCa, CVCo, etc. > CVC

d. Sp. cocina ‘kitchen’ > PHu. *kosina > Hu. /kosin\bk/ --> kos\ion

Sketch of analysis: Consonants bear both primary and secondary place features, except for inherent palatals, which have only a primary place feature.

<table>
<thead>
<tr>
<th>a. /p/</th>
<th>b. /p\pal/</th>
<th>c. /t/</th>
<th>d. /t\pal/</th>
<th>e. /k/</th>
<th>f. /k\pal/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary place</td>
<td>[lab]</td>
<td></td>
<td>[dent]</td>
<td></td>
<td>[vel]</td>
</tr>
<tr>
<td>Secondary place</td>
<td>[back]</td>
<td>[pal]</td>
<td>[back]</td>
<td>--</td>
<td>[back]</td>
</tr>
</tbody>
</table>

Diphthongization results when a consonant feature must surface on the preceding vowel nucleus in order to surface at all (high-ranked MAX).

a. Rising diphthongs

/ i t # /     i _ t
Primary [pal][dent] [pal][dent] [pal][pal][dent]
Secondary [bk] [bk] [bk]

b. Falling diphthongs

/ o k\pal # / ----> o _ k\pal ----> o i k
Primary [bk] [vel] [bk] [vel] [bk][pal][vel]
Secondary [pal] [pal] [pal]

c. No change: “front” context. Features merge?

/- e \k\pal # /     e \ k
Primary [pal][vel] [pal][vel] [pal][vel]
Secondary [pal][pal]

d. No change: “back” context

/ u p # /     u _ p
Primary [bk][lab] [bk][lab] [bk][lab]
Secondary [bk][bk]

e. No change (coarticulation only): inherent palatals

/ a t\pal # /     a ty
Primary [bk][pal] [bk][pal]
(35) Summary:
• Palatal coronals do not undergo fission since they already have inherent palatal place of articulation
• The plain status of non-palatalized consonants is always enhanced after front vowels; there is no set of consonants that “inherently” realizes [back].
• Both [back] and [pal] are active; if the opposition was privative and non-palatality features were not specified, hard to see how the [back] element of rising diphthongs io and ia could come about.

D Infix harmony as MAX >> Vowel Copy

(41) Infixation with vowel copy: when vowel and consonant match

<table>
<thead>
<tr>
<th>Front V/C^pal</th>
<th>Back V/C^bk</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. i-m-a-jir.i.m /jimb^pal/</td>
<td>c. dyu-sa-raj-p /sap^bk/</td>
</tr>
<tr>
<td>FT-SB-TV-sweep.PASS</td>
<td>PROG-catch.PASS</td>
</tr>
<tr>
<td>‘it will be swept’ (3;26)</td>
<td>‘it is being caught’ (2;106)</td>
</tr>
<tr>
<td>b. a-xe.re.ng /xeng^pal/</td>
<td>d. a-ndo.ro.k /ndok^bk/</td>
</tr>
<tr>
<td>TV-raise.PASS</td>
<td>TV-fish.PASS</td>
</tr>
<tr>
<td>‘it is raised’ (2;118)</td>
<td>‘it is fished’ (2;109)</td>
</tr>
<tr>
<td>e. t-a-xu.ru.m /xum^bk/</td>
<td></td>
</tr>
<tr>
<td>CP-TV-find.PASS</td>
<td></td>
</tr>
<tr>
<td>‘it was found’ (2;97)</td>
<td></td>
</tr>
</tbody>
</table>

(42) Infixation with default vowels: front vowels, “back” consonants

<table>
<thead>
<tr>
<th>Front V/C^bk</th>
<th>Back V/C^pal</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. a-ndi.ra.m /ndim^bk/</td>
<td>c. /-Ca.rV.C^pal/</td>
</tr>
<tr>
<td>TV-want.PASS</td>
<td>/unattested</td>
</tr>
<tr>
<td>‘it is wanted, desirable’ (2;129)</td>
<td></td>
</tr>
<tr>
<td>b. t-a-mi.raj.t /mit^bk/</td>
<td></td>
</tr>
<tr>
<td>CP-TV-bury.PASS</td>
<td>/-Co.rV.C^pal/</td>
</tr>
<tr>
<td>‘it was buried’ (2;119)</td>
<td>/unattested</td>
</tr>
<tr>
<td>c. m-a-nde.ra.k /ndek^bk/</td>
<td></td>
</tr>
<tr>
<td>SB-TV-speak.PASS</td>
<td>/-Cu.rV.C^pal/</td>
</tr>
<tr>
<td>‘(that) it is spoken’ (2;93)</td>
<td>/unattested</td>
</tr>
</tbody>
</table>

(43) Two competing pressures:
• MAX: Realize input features (motivated in preceding section)
• “VowelCopy”: Copy features from the preceding vowel (cover constraint)

(44) MAX >> VowelCopy means that vowel copy fails if there are features that need to be realized. (44a) copies the vowel, but sacrifices secondary [bk]. Schematically:
“Sour grapes” effect: VowelCopy is all-or-nothing.
• Default vowels = vowels which don’t require adding features?
• A full analysis may need DEP: don’t add features that weren’t present in the input.

Feature realization and vowel copy get infix harmony for free: same principle, except root-final consonant feature spreads to a completely empty - rather than a partially occupied - V slot.

a. Diphthongization m e m \rightarrow m i a m
     \[ | \] \[ pal \] \[ bk \]

b. Infix harmony i - r V - m \rightarrow i - r a - m
     \[ | \] \[ pal \] \[ bk \]

Primarily an Occam’s Razor argument, to the extent that MAX is independently motivated. The test case would be with inherent coronals, where feature realization is satisfied and we expect that vowel copy would be possible. This feature-realization hypothesis predicts:

An alternative hypothesis is that the epenthetic vowel gets its features from the consonant - some kind of VC sequencing or transition constraint. Different prediction. Before we can test this prediction, we will need to cover suffix harmony...

Suffix harmony as CV transition constraints + Vowel Copy

In “VC matching” conditions, there is full vowel copy.
c. /-ken^pal/  
a-ken-iaf  
TV-carry.hip-3PL  
'they carry (it) on their hips' (2;75)

d. /-pejk^pal/  
t-a-pejk-iaw  
CP-TV-stoke-3PL  
'they stoked (the fire)' (3;41)

g. /-xojt^bk/  
t-a-xojt-oø  
CP-TV-rest-3PL  
'they rested' (3;43)

h. /-xum^bk/  
a-xum-uø  
TV-find-3PL  
'they find (it)' (2;65)

(49) In “VC mismatch” conditions, vowel copy is blocked - no features are copied from the preceding vowel. The epenthetic vowel is /a/ after C^bk, and /i/ after C^pal.

Front V/C^bk - default to /a/  
a. /-jing^bk/  
a-jing-af  
TV-dance-3PL  
'they dance' (0801519-Be9)

b. /-chit^bk/  
m-a-chit-af  
SB-TV-break-3PL  
'(that) they rip (cloth)' (080519-Be9)

c. /-ndim^bk/  
t-a-ndim-af  
CP-TV-want-3PL  
'they wanted' (3;3)

d. /-kwir^bk/  
dy-a-kwir-af  
PROG-TV-run-3PL  
'they are running' (2;13)

e. /-mejts^bk/  
u-mejts-aw  
POS1-heart-3PL  
'their hearts' (3;27)

f. /-ndek^bk/  
a-ndek-af  
TV-speak-3PL  
'they speak' (2;65)

Back V/C^pal - default to /i/  
g. /-tats^pal/  
m-a-tach-iaf  
SB-TV-reach-3PL  
'(that) they reach (it)' (3;3)

h. /-tsand^pal/  
m-a-tsand-iaf  
SB-TV-hit-3PL  
'(that) they play music' (3;5)

i. /-kots^pal/  
a-koch-iaf  
TV-scratch-3PL  
'they scratch (it)' (3;42)

j. /-ojt^pal/  
t-a-ojt-iow  
CP-TV-dig-3PL  
'they dig (it)' (1;175)

k. /-mbul^pal/  
a-mbul-iaf  
TV-burn-3PL  
'they burn (it)' (3;19)

l. /-un^pal/  
t-a-uñ-iaf  
CP-TV-buy-3PL  
'they bought (it)' (3;44)

(50) What's taking priority over vowel copy - feature realization? At first glance, conceivably.

<table>
<thead>
<tr>
<th>/uk^asl,V/</th>
<th>Max</th>
<th>VowelCopy</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. uk-u</td>
<td>*</td>
<td>!</td>
</tr>
<tr>
<td>b. ^ uk-i</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(51) However, in (49g-1), inherent palatals realize [pal] on the consonant, but full vowel copy is still blocked.
• (51a) realizes all features, and it also copies the vowel - satisfies both constraints. What’s wrong with it? --> The epenthetic vowel doesn’t take features from the preceding C.

<table>
<thead>
<tr>
<th>/\text{ut}^\text{pal}+\text{V}/</th>
<th>\text{MAX}</th>
<th>\text{VowelCopy}</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. \text{\text揶} \text{uty}-\text{u}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. \text{\text揶} \text{uty}-\text{i}</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

(52) Furthermore, directionality issues have not yet been addressed. The actual context has two surrounding consonants with secondary features.
• The current analysis predicts that MAX will be violated one way or another, so Vowel Copy would determine the winner.

<table>
<thead>
<tr>
<th>/\text{uk}^\text{pal}-\text{Vs}^\text{bk}/</th>
<th>\text{MAX}</th>
<th>\text{VowelCopy}</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. \text{\text揶} \text{uk}-\text{us}</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. \text{\text揶} \text{uk}-\text{is}</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

(53) And again with the inherent palatals, all constraints are satisfied - here, the vowel copied from the preceding syllable happens to satisfy MAX wrt both surrounding consonants.

<table>
<thead>
<tr>
<th>/\text{ut}^\text{pal}-\text{Vs}^\text{bk}/</th>
<th>\text{MAX}</th>
<th>\text{VowelCopy}</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. \text{\text揶} \text{uty}-\text{us}</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. \text{\text揶} \text{uty}-\text{is}</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

(54) It seems we need a constraint on CV sequences/transitions - something that gets the epenthetic vowel to match the preceding consonant for [back] or [pal].
• MAX is also automatically satisfied, but we have seen it is not sufficient on its own.
• The CV constraint also stipulates the directionality.

<table>
<thead>
<tr>
<th>/\text{ut}^\text{pal}-\text{Vs}^\text{bk}/</th>
<th>\text{CV-Match}</th>
<th>\text{MAX}</th>
<th>\text{VowelCopy}</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. uty-us</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. \text{\text揶} \text{uty}-\text{is}</td>
<td>*</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

(55) Eventually, one would want to give a coherent account of these CV restrictions in relation to onset allophony (coronals) / lack of specification (non-coronals) as described above.
• Tricky, since among other things, the behavior of /u/ is different - in harmony it is a [back] vowel, with affinities to \text{C}^{\text{bk}}, even though elsewhere it can trigger palatalization (possibly due to height features).

**F Discussion/Conclusion**

(56) Infix harmony: back to the VC-Match hypothesis. If we find the following data, we really would need to postulate a constraint separate from MAX.

<table>
<thead>
<tr>
<th>/\text{a}-\text{rV-t}^\text{pal}/</th>
<th>\text{VC-Match}</th>
<th>\text{VowelCopy}</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. \text{\text揶} \text{a-ri-ty}</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. a-\text{ra-ty}</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>
There is some tantalizing evidence that MAX is what’s at work in infix harmony after all. Words where a root-final consonant is preceded by an infix, and followed by a suffix:

/mitbk/ ‘bury’  
Passivizing infix:  mi.rVj.tbk  ‘be buried’  
Adding the 3rd pl. suffix:  mi.rVj.tbk + Vw

Which vowel does the infix get?

VC-Match predicts:  mi.raj.t-aw
- Infix vowel gets its feature from /tk/. (No directionality issue because /r/ is morpheme-initial and has no underlying specification for backness or frontness.)

<table>
<thead>
<tr>
<th>/mi.rVj.tbk/ + Vw</th>
<th>CV-Match</th>
<th>VC-Match</th>
<th>MAX</th>
<th>VowelCopy</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. 0 mi.raj.t-aw</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. mi.raj.t-aw</td>
<td></td>
<td>0</td>
<td>0!</td>
<td>0!</td>
</tr>
</tbody>
</table>

MAX potentially predicts:  mi.rjj.t-aw
- /tk/ expresses [back] on the suffix vowel, satisfying MAX.
- Infix harmony is free to satisfy VowelCopy.

One token transcribed from spontaneous speech seems to confirm the second analysis. More data are definitely needed - can it really be that the infix vowel changes depending on context, especially given that 3pl is a “Layer 4” (outer) suffix and the infix is not productive (more “inner”)? The nature of the morphology-phonology interactions here is not clear.

A. k-ami.raj.t-aw  ‘their being buried’

Cf:

b. x-i-n-a-ami.raj.t  ‘I will be buried’

The analysis is thornier, because both (60a) and (60b) have VowelCopy violations, just in different places. (CV-Match: both [ra] and [ri] are fine.)

What is it that rules out (60a)? Multiple (60a)-like candidates with different autosegmental configurations of vowel features will need to be ruled out.

<table>
<thead>
<tr>
<th>/mi.rVj.tbk/ + Vwbk</th>
<th>CV-Match</th>
<th>MAX</th>
<th>VowelCopy</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. mi.raj.t-aw</td>
<td>0</td>
<td>0!</td>
<td>0!</td>
</tr>
<tr>
<td>b. mi.raj.t-aw</td>
<td>0</td>
<td>0!</td>
<td>0!</td>
</tr>
<tr>
<td>c. mi.raj.t-1w</td>
<td>0</td>
<td>0!</td>
<td>0!</td>
</tr>
</tbody>
</table>

Commonalities between infix and suffix harmony originate from how secondary features on consonants influence surrounding sounds, but they might not be amenable to a unified analysis.

References
