

# Globality in Stratal OT

## Stratal Chains in Kashaya Metrical Structure

EUGENE BUCKLEY  
UNIVERSITY OF PENNSYLVANIA

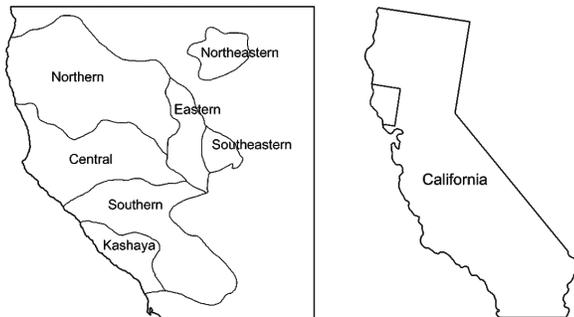
May 2012  
20th Manchester Phonology Meeting

## Outline of talk

- Kashaya stress patterns
  - interactions with morphological structure
- evidence for global interaction
  - problems with ordered operations
- some approaches within OT
  - Classic OT and Constraint Domains
  - OT-CC and Optimal Interleaving
- Stratal OT with Candidate Chains
  - lexical levels with globality
  - and a global syllabification alternative

2

## Pomoan family



3

## Iambs and syllable extrametricality

- syllable extrametricality in disyllabic or prefixed **roots** (Buckley 1994)
- iambic lengthening of stressed open syllables

[[ **mo**-mul-ic'-ed ] u ]  
( mo mú· ) ( li c'e· ) du  
'run in circles'

[[ **kel**-mul-ad-uced ] u ]  
( kél ) ( mu la· ) ( du ce· ) du  
'keep peering around'

[[ **qaʔc'**at-ad-uced ] u ]  
<qaʔ> ( c'a tá· ) ( du ce· ) du  
'used to cry and cry'

[[ **qaʔc'**at ] ʔkʰe ] tʰin  
<qaʔ> ( c'át' ) ( kʰe tʰin )  
'shouldn't cry'

4

## Foot extrametricality

- applies to initial Cv· foot; long vowel can be derived by elision
- initial Cv· relative to syllable extrametricality, if present

[[ **di**·c'-id ] ba ]  
«di·» ( c'in' ) ba  
'after having said'

[[ **cu**·se-to-ʔna ]  
«cu·» ( se tóʔ ) na  
'at our uncle's house'

[[ **du**·ʔya·q-ad-qa ] ba ]  
<duʔ> «ya·» ( qán' ) ( qa ba )  
'after thinking about it'

[[ **ba**·ne-aduc-qa ] ·li ]  
<ba> «ne·» ( dúcʰ ) ( qa· ) li  
'when (they) sent it off in the distance'

5

## Foot Flipping

- initial Cv·Cv → CvCv· modulo syllable extrametricality
- results in a "perfect iamb", which is also extrametrical

[[ **t'e**·t-ibic ] ba ]  
«t'e ti·» ( bic' ) ba  
'having stood up'

[[ **di**·c'-id-uwad-uced ] u ]  
«di c'i·» ( du wá· ) ( du ce· ) du  
'he used to tell (this story)'

[[ **muna**·c-id ] uʔba ]  
<mu> «na ci·» ( dúʔ ) ba  
'would be shy'

[[ **loq'o**·c-ad-uwad ] u ]  
<lo> «q'o ca·» ( du wá· ) du  
'make noise by moving around'

6

## Level ordering

- fundamental structure of a Kashaya verb  
[[ [ t'e-t ]<sub>ROOT</sub> ibic ]<sub>STEM</sub> ba ]<sub>WORD</sub>
- “Level 1” = Stem Level suffixes
  - a verb can contain many such suffixes, but sometimes none
    - directionals, inceptives
    - reflexive, reciprocal
    - causative
    - duratives, distributive
- “Level 2” = Word Level suffixes
  - every verb requires one slot to be filled, chosen from several categories
    - absolutive
    - evidentials
    - imperatives
    - modals
    - switch reference
  - a few other suffixes can precede or follow this slot

7

## Stem-level phenomena

- most changes in vowel length are restricted to the Stem
  - Iambic Lengthening and Foot Flipping
    - many examples to follow
  - also Elision of V+V to produce a long vowel
    - e.g. /ba-ne-aduc/ → /bane-duc/ ‘send away’
    - at the Word level, the output is short
- Sonorization of /c/ to /y/ preceding /ic/
  - e.g. /tubic-ic'/ → /tubiyic'/ ‘get oneself up’
  - does not occur with Word-level suffixes
- “Decrement” or deletion of laryngeal increments /h, ʔ/
  - triggered by several classes of suffixes
    - e.g. /bahcu-ibic/ → /bacu-bic/ ‘jump up’
  - but all are in the Stem level
- possibly several other phenomena
  - Aspirate Dissimilation, Height Harmony
  - depends on exact formulation of the processes

8

## Lengthening only within the stem

- Stem Level suffixes undergo Lengthening and Flipping
- Word Level suffixes do not undergo either process

|   |                               |
|---|-------------------------------|
| [[ [ s'i ] p <sup>h</sup> ila ]<br>( s'i p <sup>h</sup> i ) la<br>'if it happens' | * ( s'i p <sup>h</sup> i ) la |
| [[ mo-mac-ed ] ela ]<br>( mo má ) ( ce de ) la<br>'I keep running in there'       | * ( mo má ) ( ce de ) la      |
| [[ ca-hke ] wi-ya-e ]<br><cah> ( ke wí ) ( ye )<br>'it blocked me from sitting'   | * <cah> ( ke wí ) ( ye )      |
| [[ bawil ] ela ]<br><ba> ( wí lé ) la<br>'I am putting (it) in'                   | * <ba> ( wí lé ) la           |

9

## Flipping only within the stem

- Foot Flipping occurs only if the entire Cv·Cv is located in the Stem
- otherwise the Cv· remains a nonbranching (and extrametrical) foot

|  |   |
|--|---|
| [[ q'a· ] mela ]<br>«q'a·» ( me lá )<br>'I left'                           | [[ q'a·-cid ] u ]<br>«q'a ci·» ( dú )<br>'keep leaving'                                   |
| [[ sima·q ] eti ]<br><si> «ma·» ( qa tí )<br>'although he's asleep'        | [[ sima·q-ad ] u ]<br><si> «ma qa·» ( dú )<br>'usually sleep'                             |
| [[ qa-t'·o· ] wi-ya-e ]<br><qa> «t'o·» ( wí yé )<br>'rubbed off my (skin)' | [[ qa-t'·o·-cid-uced ] u ]<br><qa> «t'o ci·» ( du cé· ) du<br>'be peeling with the teeth' |

- a degenerate foot such as (*du*) is permitted when necessary
- so this cannot be what causes avoidance of Flipping in the Word level

10

## No Flipping before CVC

- since Flipping applies to Cv·Cv, it is blocked in Cv·CvC
- this is true even fully within the Stem Level

|  |   |
|--|---|
| [[ [ q'a·-cid ] ba ]<br>«q'a·» ( cin' ) ba<br>'after leaving'  | [[ [ q'a·-cid ] u ]<br>«q'a ci·» ( dú )<br>'keep leaving'                                   |
| [[ [ sima·q-ad ] t <sup>h</sup> -e ]<br><si> «ma·» ( qá? ) t <sup>h</sup> e<br>'can't sleep'               | [[ [ sima·q-ad ] u ]<br><si> «ma qa·» ( dú )<br>'usually sleep'                             |
| [[ [ qa-t'·o·-cid ] t <sup>h</sup> u ] ?<br><qa> «t'o·» ( cí? ) ( t <sup>h</sup> u? )<br>'don't peel (it)' | [[ [ qa-t'·o·-cid-uced ] u ]<br><qa> «t'o ci·» ( du cé· ) du<br>'be peeling with the teeth' |

- Flipping is restricted to the Stem Level suffixes
- but whether CvC occurs can depend on the Word Level suffixes

11

## Ordering analysis of Lengthening

- apply Lengthening to the Stem
  - only Stem level suffixes are present at this point
- then add the Word level suffixes without Lengthening
  - new suffixes do not undergo the process
- this approach can be implemented in Lexical Phonology (Buckley 1994)
  - also in any derivational theory that permits an intermediate representation of the Stem to which phonological processes apply

12

## Final extrasyllabic C

- extrasyllabic final C in Stem to permit Lengthening there  
[ **mo**-mul-ic'-ed ]  
( mo mú· ) ( li c'e· ) d'
- necessary since often ends up as an open syllable due to Word suffix  
[ [ **mo**-mul-ic'-ed ] u ]  
( mo mú· ) ( li c'e· ) du 'run in circles'
- if the syllable ends up closed, it can shorten again independently  
[ **mo**-mul-ic'-ed ]  
( mo mú· ) ( li c'e· ) d  
[ [ **mo**-mul-ic'-ed ] ba ]  
( mo mú· ) ( li c'en' ) ba 'after running in circles'
- so here, look-ahead is not crucial; but Flipping is more complicated...

13

## Look-ahead for Flipping

- when we see just the Stem with extrasyllabicity, Flipping should apply  
[ **q'a**· - cid ]  
«q'a ci·» d'
- but we can't predict whether we'll eventually have CvC or Cv  
[ [ **q'a**·-cid ] ba ] [ [ **q'a**·-cid ] u ]  
«q'a·» ( cin' ) ba «q'a ci·» ( dú )  
'after leaving' 'keep leaving'
- and we can't just undo it by shortening, unlike with Iambic Lengthening  
[ [ **q'a**·-cid ] ba ]  
«q'a ci·» d ba  
→ «q'a ci-n'» ba  
→ \* «q'a cin'» ( bá ) ~ \* ( q'a cin' ) ba

14

## Avoiding look-ahead

- Buckley (1994) splits the effect of Foot Flipping into two steps
  - first set the stage for Flipping
  - implemented later only if syllable structure permits
  - converted here to a two-level analysis
- Stem Level: adjoin the Cv to Cv', creating "anti-iamb" Cv·Cv
 

|                              |                        |
|------------------------------|------------------------|
|                              | [ <b>q'a</b> · - cid ] |
| <i>Foot Extrametricality</i> | «q'a·» ci d'           |
| <i>CV Adjunction</i>         | «q'a· ci» d'           |
- Word Level: closed syllable destroys Cv·Cv, else Flipping occurs
 

|                             |                            |
|-----------------------------|----------------------------|
| [ [ <b>q'a</b> ·-cid ] ba ] | [ [ <b>q'a</b> ·-cid ] u ] |
| «q'a· ci» d ba              | «q'a· ci» d u              |
| «q'a·» ( cin' ) ba          | «q'a ci·» du               |

15

## Lexical Phonology summary

- advantages
  - architecture captures Stem / Word distinction
  - Iambic Lengthening, CV Adjunction simply turn off
  - the general problem of opacity has an easy solution in ordered rules
- disadvantages
  - Flipping is split into two processes
    - temporary anti-iamb violates general pattern of language
  - makes no connection with Lengthening
    - yet both are fundamentally about changes in vowel length
- classic Optimality Theory avoids the look-ahead problem
  - evaluates the output directly, with surface syllabification present
  - but requires some other means of identifying the lengthening suffixes
    - some domain equivalent to the Stem
    - or a long list of relevant morphemes

16

## Constraint Domains

- Buckley (1996, 1997) proposes Constraint Domains
  - index constraints to particular substrings of the output
  - roughly the same as the morphological bracketing, but not nested

|  |   |
|--|---|
| [ [ <b>si</b> ma·q ] eti ]                     | [ [ <b>si</b> ma·q-ad ] u ]                     |
| { si ma·q } <sub>S</sub> { e ti } <sub>W</sub> | { si ma· qa d } <sub>S</sub> { u } <sub>W</sub> |
| <si> «ma·» ( qa tí )                           | <si> «ma qa·» ( dú )                            |
- ranking ensures that Word suffixes are faithful to underlying length
  - IDENT-LENGTH : the length of a segment is identical in input and output
  - \*(CV·)CV or other FtFORM constraints that force Flipping to occur
  - IDENT-LENGTH<sub>WORD</sub> >> \*(CV·)CV >> IDENT-LENGTH<sub>STEM</sub>

17

## Flipping with Stem vs. Word suffixes

[ [ **si**ma·q-ad ] u ]

|                   | {si ma·q ad } <sub>S</sub> {u } <sub>W</sub> | IDENT-L <sub>W</sub> | *(CV·)CV | IDENT-L <sub>S</sub> |
|-------------------|--|----------------------|----------|----------------------|
| a.                | si (ma·) (qa dú)                             |                      | *!       |                      |
| b. <sup>ESP</sup> | si (ma qa·) (dú)                             |                      |          | **                   |

[ [ **si**ma·q ] eti ]

|                   | {si ma·q } <sub>S</sub> {eti } <sub>W</sub> | IDENT-L <sub>W</sub> | *(CV·)CV | IDENT-L <sub>S</sub> |
|-------------------|---|----------------------|----------|----------------------|
| c. <sup>ESP</sup> | si (ma·) (qa tí)                            |                      | *        |                      |
| d.                | si (ma qa·) (tí)                            | *!                   |          | *                    |

- here Flipping causes two IDENT violations, unlike Buckley (1997)
- the difference is not crucial

18

## Similar for Iambic Lengthening

[[ mo-mac-ed ] ela ]

|                   | {momaced} <sub>S</sub> {ela} <sub>W</sub> | IDENT-L <sub>W</sub> | SWP | IDENT-L <sub>S</sub> |
|-------------------|---|----------------------|-----|----------------------|
| a.                | (mo má) (ce de) la                        |                      | *!* |                      |
| b. <sup>ESP</sup> | (mo má·) (ce de) la                       |                      | *   | *                    |
| c.                | (mo má·) (ce de·) la                      | *!                   |     | *                    |

- SWP = STRESS-TO-WEIGHT PRINCIPLE : a stressed syllable is heavy
  - causes Iambic Lengthening
- it may be possible to unify the constraints for Lengthening and Foot Flipping
  - cf. also PERFECT-IAMB or UNEVEN-IAMB: a foot has the shape CVCV·
  - details remain to be worked out
- Buckley (1997) used gradient foot alignment for Foot Flipping
  - favoured expanding a foot rightward
  - this type is now generally deprecated in favor of categorical constraints
    - Kager (2001), McCarthy (2003), Buckley (2009)

19

## No look-ahead required

[[ q'a-cid ] u ]

|                   | {q'a-cid} <sub>S</sub> {u} <sub>W</sub> | IDENT-L <sub>W</sub> | *(CV-)CV | IDENT-L <sub>S</sub> |
|-------------------|---|----------------------|----------|----------------------|
| a.                | (q'a·) (ci dú)                          |                      | *!       |                      |
| b. <sup>ESP</sup> | (q'a ci·) (dú)                          |                      |          | **                   |

[[ q'a-cid ] ba ]

|                   | {q'a-cid} <sub>S</sub> {ba} <sub>W</sub> | IDENT-L <sub>W</sub> | *(CV-)CV | IDENT-L <sub>S</sub> |
|-------------------|--|----------------------|----------|----------------------|
| c. <sup>ESP</sup> | (q'a·) (cin') ba                         |                      |          |                      |
| d.                | (q'a ci·n') (bá)                         |                      |          | *!*                  |
| e.                | (q'a cin') (bá)                          |                      |          | *!                   |

- forms (d) and (e) would be distinguished by a phonotactic constraint \*v·C
- the main point is that they both lose

20

## Constraint Domains summary

- advantages
  - IDENT-L connects Lengthening and Flipping
    - one indexed constraint for the Word level accounts for both
  - no need for look-ahead
    - the full output is evaluated at once
- disadvantages
  - stipulates Stem / Word distinction
    - laid on top of output, rather than part of architecture
  - has no inherent account for opacity
    - would require extra mechanisms just like Classic OT
  - e.g., Phrasal footing can be different from Word, without Flipping
    - [[ baco· ] ] [[ si-bo-ad ] u ] hat tip to Paul Kiparsky
    - (ba) «co·» ( si bó· ) dú 'a group of boats is sailing along'
    - \*(ba) «co si·» ( bó· ) dú
  - yet the entire sequence /co·si/ is in two Stem domains
    - so changes to vowel length there ought to be permitted

21

## Stratal Optimality Theory

- fixed stages in derivation (Kiparsky, Bermúdez-Otero)
  - Stem, Word, Phrase
  - output of level  $n$  is input to level  $n+1$
  - limited handling of opacity across strata
- assume each stage is internally global like Classic OT
  - candidates evaluated against constraint ranking at that level

|                   |                       |                                     |
|-------------------|-----------------------|-------------------------------------|
| <b>Stem Level</b> | <i>morphology</i>     | mo-mac-ed                           |
|                   | <i>output of Eval</i> | (mo ma ) ce d' SWP >> IDENT-L       |
| <b>Word Level</b> | <i>morphology</i>     | (moma )ced-ela                      |
|                   | <i>output of Eval</i> | (mo ma·) (ce de) la IDENT-L >>> SWP |

22

## Stratal OT and globality

- stratum-internal globality won't help with the look-ahead problem
  - in this regard, it's exactly like Lexical Phonology
- would still need some equivalent to CV Adjunction in the Stem level
  - but what kind of constraints will generate this result?
  - why no Lengthening at the Word level if Flipping occurs there?

|                   |                       |                                     |
|-------------------|-----------------------|-------------------------------------|
| <b>Stem Level</b> | <i>morphology</i>     | q'a-cid                             |
|                   | <i>output of Eval</i> | (q'a ci) d PARSE-SYL >> Ft-FORM ?   |
| <b>Word Level</b> | <i>morphology A</i>   | (q'a ci)d-u                         |
|                   | <i>output of Eval</i> | (q'a ci·) (dú) PERFECT-IAMB ?       |
| <b>or</b>         | <i>morphology B</i>   | (q'a ci)d-ba                        |
|                   | <i>output of Eval</i> | (q'a·) (cin') ba *v·C >> Ft-FAITH ? |

23

## OT with Candidate Chains

- Eval compares CHAINS of candidates (McCarthy 2007)
  - a set of representations moving from input to output
  - e.g. transparent derivation < pap, papə, pabə, paβə, 'paβə, 'pa:βə >
- Gradualness
  - one step in the chain for every faithfulness violation
  - each step must be HARMONICALLY IMPROVING
- handles opacity by PRECEDENCE constraints: PREC(A,B)
  - violation of Faith constraint A has to precede violation of B in the chain
  - and violation of A cannot follow violation of B
  - e.g. opaque < pap, papə, pabə, paβə, 'paβə > without lengthening
    - reject < ... papə ... 'pa:βə > if IDENT-L cannot be violated after DEP
- original theory does not handle level ordering
  - perhaps use morpheme-specific ranking for all the Word-level suffixes
  - but no inherent account of Stem vs. Word clustering and ordering

24

## Optimal Interleaving

- Spell-out of each morpheme occurs as a step in the chain (Wolf 2008)
    - ordering of spell-out can therefore be controlled by Precedence
  - in Kashaya, Word-level suffixes would be spelled out after lengthening
    - chain (b) violates PREC ( IDENT-L, Insert-Aff<sub>ClassW</sub> )
    - violation of IDENT-L (8) cannot be preceded by spell-out of a “Word” affix (6)
- |  |  |
|--|--|
| <p><b>a.</b></p> <ol style="list-style-type: none"> <li>1 &lt; mo-DIR,-DUR,-EVID<sub>s</sub>,</li> <li>2 momac-DUR,-EVID<sub>s</sub>,</li> <li>3 momaced-EVID<sub>s</sub>,</li> <li>4 (moma)ced-EVID<sub>s</sub>,</li> <li>5 (moma·)ced-EVID<sub>s</sub>,</li> <li>6 (moma·)cedela,</li> <li>7 (moma·)(cede)la &gt;</li> </ol> | <p><b>b.</b></p> <ol style="list-style-type: none"> <li>1 &lt; mo-DIR,-DUR,-EVID<sub>s</sub>,</li> <li>2 momac-DUR,-EVID<sub>s</sub>,</li> <li>3 momaced-EVID<sub>s</sub>,</li> <li>4 (moma)ced-EVID<sub>s</sub>,</li> <li>5 (moma·)ced-EVID<sub>s</sub>,</li> <li>6 (moma·)cedela,</li> <li>7 (moma·)(cede)la,</li> <li>8 (moma·)(cede)la &gt;</li> </ol> |
|--|--|
- would need separate PREC for clustered Stem-level phenomena
    - Sonorization, Decrement, possibly others
    - not related to vowel length and so IDENT-L is not relevant

25

## Global evaluation of Stratal OT

- proposal: maintain the Stratal OT levels of representation
  - Stem ⇒ Word ⇒ Phrase
- but evaluate all representations globally
  - somewhat similar idea in Baker (2009)
- borrow the notion of Chains from OT-CC
  - but here, a fixed number of steps in chain, defined by strata
    - < Input , Stem-Output , Word-Output , Phrase-Output >
  - certain affinities to Constraint Domain approach
- unlike OT-CC, which is GRADUAL
  - also will not use Precedence constraints
  - level ordering and opacity receive usual Stratal OT analyses

26

## Stratal Chains

- same structural relations among Stem, Word, Phrase levels
  - but choice of output  $n$  is potentially affected by output  $n+1$
- chain consists of Input (≈UR) plus three stratal outputs
  - first item in chain, the Input, might be “fully faithful parse” of UR
    - with syllabic and possibly moraic structure added; not foot structure
  - morphology is not present from the beginning
    - unlike OT-CC and Classic OT, but more like OI
- I’ll mostly set aside the Phrase-Output here
  - but it’s actually central for other facts about Kashaya stress, which is assigned to the phonological phrase and can span words (Buckley & Gluckman 2012)
  - in particular, a degenerate foot is probably not created until the Phrase level (lower ranking of FT-BIN there)
  - the effect of Foot Extrametricality is felt in the Phrase as well

27

## Kashaya derivations

- vowel length in the Stem depends on the suffix added in the Word level

|                   |                       |                |                  |
|-------------------|-----------------------|----------------|------------------|
| <b>Input</b>      | <i>root</i>           | q'a·           | q'a·             |
|                   | <i>faithful parse</i> | q'a·           | q'a·             |
| <b>Stem Level</b> | <i>morphology</i>     | q'a·-cid       | q'a·-cid         |
|                   | <i>output of Eval</i> | (q'a ci·) d    | ! (q'a·) ci d    |
| <b>Word Level</b> | <i>morphology</i>     | (q'a ci)d-u    | (q'a ci)d-ba     |
|                   | <i>output of Eval</i> | (q'a ci·) (dú) | (q'a·) (cin') ba |

- global evaluation of the chains can achieve this effect
  - < q'a· , (q'a ci·) d , (q'a ci·)(dú) >
  - < q'a· , (q'a·) ci d , (q'a·)(cin') ba >

28

## SL and WL for /q'a·-cid-u/

### Stem Level

|                               |      |          |                      |
|-------------------------------|------|----------|----------------------|
| q'a·-cid                      | *V·C | *(CV·)CV | IDENT-L <sub>S</sub> |
| a. (q'a·) ci d                |      | *!       |                      |
| b. <sup>ESP</sup> (q'a ci·) d |      |          | **                   |

### Word Level

|                                    |      |                      |          |
|------------------------------------|------|----------------------|----------|
| a. (q'a·)cid-u                     | *V·C | IDENT-L <sub>W</sub> | *(CV·)CV |
| i. ( <sup>ESP</sup> (q'a·) (ci dú) |      |                      | *        |
| ii. (q'a ci·) (dú)                 |      | *!*                  |          |

|                                  |      |                      |          |
|----------------------------------|------|----------------------|----------|
| b. (q'aci·)d-u                   | *V·C | IDENT-L <sub>W</sub> | *(CV·)CV |
| i. <sup>ESP</sup> (q'a ci·) (dú) |      |                      |          |

29

## Global evaluation of /q'a·-cid-u/

- violations for each step in the chain are considered as a group, but presented heuristically
- candidate *a.i.* without Flipping fails because it violates the relevant constraint without being forced to by a higher constraint
- candidate *a.ii.* is homophonous with the winner but only by chance; it is rejected due to Word-level Flipping

|                     |                |                      |          |                      |
|---------------------|----------------|----------------------|----------|----------------------|
|                     | *V·C           | IDENT-L <sub>W</sub> | *(CV·)CV | IDENT-L <sub>S</sub> |
| a.i.                | (q'a·) ci d    |                      | *!       |                      |
|                     | (q'a·) (ci dú) |                      | *        |                      |
| a.ii.               | (q'a·) ci d    |                      |          |                      |
|                     | (q'a ci·) (dú) | *!*                  |          |                      |
| b.i. <sup>ESP</sup> | (q'a ci·) d    |                      |          | **                   |
|                     | (q'a ci·) (dú) |                      |          |                      |

30

## SL and WL for /q'a·-cid-ba/

### Stem Level

| q'a·-cid       | *V·C | *(CV·)CV | IDENT-L <sub>S</sub> |
|----------------|------|----------|----------------------|
| a. (q'a·) ci d |      | *!       |                      |
| b. (q'a ci·) d |      |          | **                   |

### Word Level

| a. (q'a·)cid-ba      | *V·C | IDENT-L <sub>W</sub> | *(CV·)CV |
|----------------------|------|----------------------|----------|
| i. (q'a·) (cin') ba  |      |                      |          |
| ii. (q'a ci·n') (bá) | *!   | **                   |          |

| b. (q'aci·)d-ba     | *V·C | IDENT-L <sub>W</sub> | *(CV·)CV |
|---------------------|------|----------------------|----------|
| i. (q'a ci·n') (bá) | *!   |                      |          |
| ii. (q'a cin') (bá) |      | *                    |          |

31

## Global evaluation of /q'a·-cid-ba/

- crucial example of the Word level affecting the Stem level
- candidate *b.i.* has Flipping and leaves an ill-formed syllable
- candidate *b.ii.* has Flipping with Word-level shortening

|                                      | *V·C | IDENT-L <sub>W</sub> | *(CV·)CV | IDENT-L <sub>S</sub> |
|--------------------------------------|------|----------------------|----------|----------------------|
| a.i. (q'a·) ci d<br>(q'a·) (cin') ba |      |                      | *        |                      |
| b.i. (q'a ci·) d<br>(q'a ci·n') ba   | *!   |                      |          |                      |
| b.ii. (q'a ci·) d<br>(q'a cin') ba   |      | *!                   |          | **                   |

32

## Global syllabification

- the Kashaya pattern is very much dependent on syllable structure
  - so consider an approach that refers directly to syllabification
  - limit the effect of globality to this domain for a more restrictive theory
- constraint GLOBALSYL that looks at next-level output syllabification
  - penalize a segment whose syllable role is different from its later correspondent
  - an unsyllabified consonant satisfies the constraint vacuously
  - but violates PARSE, so such candidates are preferred only when motivated

| Stem: /q'a·-cid/       | GLOBALSYL | PARSE | *(CV·)CV | IDENT-L |
|------------------------|-----------|-------|----------|---------|
| a. (q'a·) cid          |           |       |          |         |
| b. (q'a·) ci d'        |           | *!    | *        |         |
| c. (q'a ci·) d'        |           | *!    |          | **      |
| Word: (q'a·) (cin') ba |           |       |          |         |

33

## Contingent non-syllabification

- when the final C is later in the onset, it is temporarily unsyllabified
  - don't need a defective syllable to provide a stem-final onset position
  - also prevents coda processes from wrongly applying to such consonants (Rice 1990)
- eliminates need for general extrasyllabicity at the Stem level
  - instead, it is forced exactly when motivated by later onset position
  - otherwise, Stem coda directly blocks Foot Flipping
  - IDENT-L is still ranked higher in the Word level, but has no global effect

| Stem: /q'a·-cid/   | GLOBALSYL | PARSE | *(CV·)CV | IDENT-L |
|--------------------|-----------|-------|----------|---------|
| a. (q'a·) cid      | *!        |       |          |         |
| b. (q'a·) ci d'    |           | *     | *!       |         |
| c. (q'a ci·) d'    |           | *     |          | **      |
| Word: (q'a ci·) du |           |       |          |         |

34

## Conclusion

- global evaluation of stratal chains
  - captures the Stem / Word dichotomy like Stratal OT
  - captures the central role of IDENT-LENGTH like Constraint Domains
- generates a superset of the grammars that regular Stratal OT does
  - something like this is necessary for Kashaya
  - more cases? alternative approaches?
- what aspects of the representation can be subject to cross-level global effects?
  - can only Faithfulness constraints be re-ranked and therefore indexed?
  - or just global sensitivity to syllabification in the next output form
- could global power help with level-internal opacity?
  - a challenge for Stratal OT (McCarthy 2007)

35

## References

- Baker, Adam. 2009. Parallel evaluation in Stratal OT. Ms., University of Arizona.
- Bermúdez-Otero, Ricardo (2011). Cyclicity. *The Blackwell Companion to Phonology*, vol. 4, 2019-2048. [etc]
- Buckley, Eugene. 1994. Persistent and cumulative extrametricality in Kashaya. *Natural Language and Linguistic Theory* 12, 423-464.
- Buckley, Eugene. 1996. Levels vs. domains: the case of Kashaya vowel length. *Proceedings of the Berkeley Linguistics Society* 22, 36-45.
- Buckley, Eugene. 1997. Optimal iambs in Kashaya. *Rivista di Linguistica* 9, 9-52.
- Buckley, Eugene. 2009. Locality in metrical phonology. *Phonology* 26, 389-435.
- Buckley, Eugene & John Gluckman. 2012. Syntax and prosody in Kashaya phrasal accent. *U. Penn Working Papers in Linguistics* 18, 21-30.
- Kager, René. 2001. Rhythmic directionality by positional licensing. Handout of presentation given at HILP-5, University of Potsdam, January 11.
- Kiparsky, Paul. 2000. Opacity and cyclicity. *The Linguistic Review* 17, 351-367. [etc]
- McCarthy, John. 2003. OT constraints are categorical. *Phonology* 20, 75-138.
- McCarthy, John. 2007. *Hidden Generalizations: Phonological Opacity in Optimality Theory*. Equinox.
- Oswald, Robert L. 1961. *A Kashaya grammar (Southwestern Pomo)*. Dissertation, UC Berkeley.
- Oswald, Robert L. 1964. *Kashaya texts*. University of California Press.
- Rice, Keren. 1990. Predicting rule domains in the phrasal phonology. In S. Inkelas & D. Zec (eds.), *The Phonology-Syntax Interface*. CSLI, Stanford and University of Chicago Press, 289-312.
- Wolf, Matthew. 2008. *Optimal Interleaving: Serial phonology-morphology interaction in a constraint-based model*. Dissertation, UMass Amherst.
- Wolf, Matthew. 2011. Limits on global rules in Optimality Theory with Candidate Chains. *Phonology* 28, 87-128.

36