Linguistics 251 B. Hayes

Vowel Harmony Spring 2019

Class 9 (5/1/19): Double Triggers in Manchu; Harmonic Serialism II; Sanskrit Nati

# Readings

* Read:
* Wendell Kimper (2011) Competing triggers: Transparency and opacity in vowel harmony, UMass dissertation
* On course web site for Week 5.
* Try to get through first three chapters if you can; we might extend this into a later class.

# Plan for today

* Analytic exercise: double triggers in Manchu
* Collate: what criteria for evaluating a theory of harmony do we have in hand so far?
* Cover McCarthy’s Harmonic Serialism theory of harmony.

# On tap

* Continue the theory-bazaar
* Done with Humble, Spans, and soon Harmonic Serialism
* More theories; we might do:

—Credit-for-spreading: Kimper

—Agreement by Correspondence (Rose, Walker, Hansson, etc.)

—Directional-OT (Eisner)

—Nevins’s non-OT approach

* Others perhaps on request … (I can’t keep this up forever; I want to do the other stuff too)
* Then on to phonetics, experimentalism, learnability
* We will continue the language-exercises, hoping to get a clear sense of typology by the time we are done.

today’s language exercise: double triggers in classical manchu

# Source

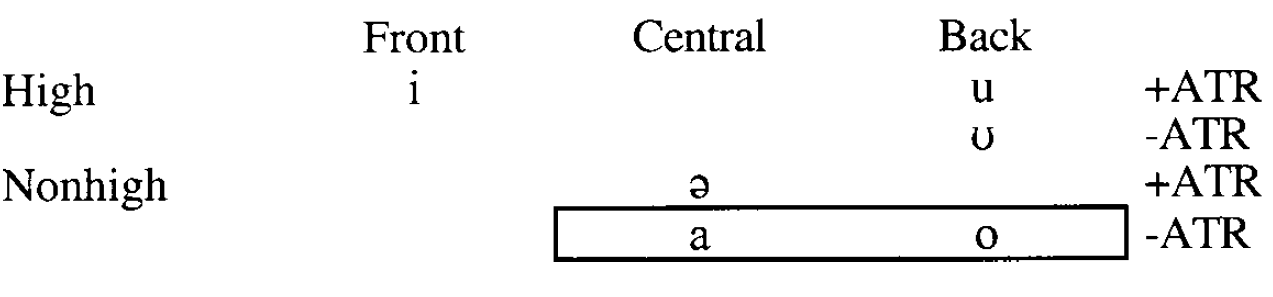
* Walker, R. (2001). Round licensing, harmony, and bisyllabic triggers in Altaic. *Natural Language and Linguistic Theory* 19: 827-878.
* Walker cites original work by Zhang and Dresher which I have not obtained.

# Background (< casual web sources)

* Tungusic, hence probably Altaic
* It once rode high as the “language of the Manchu court” (the Qing dynasty, 1644-1912 was Manchu)
* Now nearly extinct, due to cultural assimilation of its speakers to Mandarin.
* The Manchu people are hardly extinct, there being about 10 million.

# Vowel system

* Box indicates the harmonizing pair.

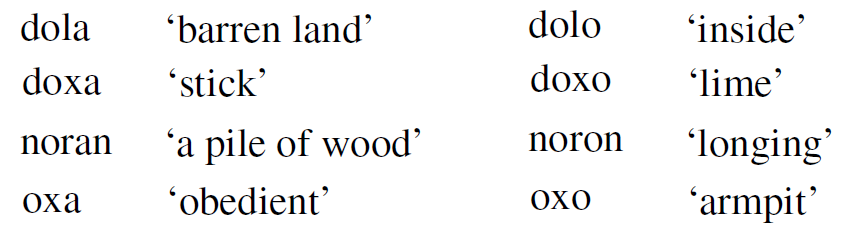


* We saw this low-only pattern when we studied Kaun’s (2004) factorial typology of vowel harmony.
* This particular pattern is a consequence of Kaun’s principles:
* “Spread bad vowel”
* “Spread among vowels equal in height”
* She has an articulatory story for the latter pattern but “like assimilates to like” is also a candidate.

# Phonotactic restriction

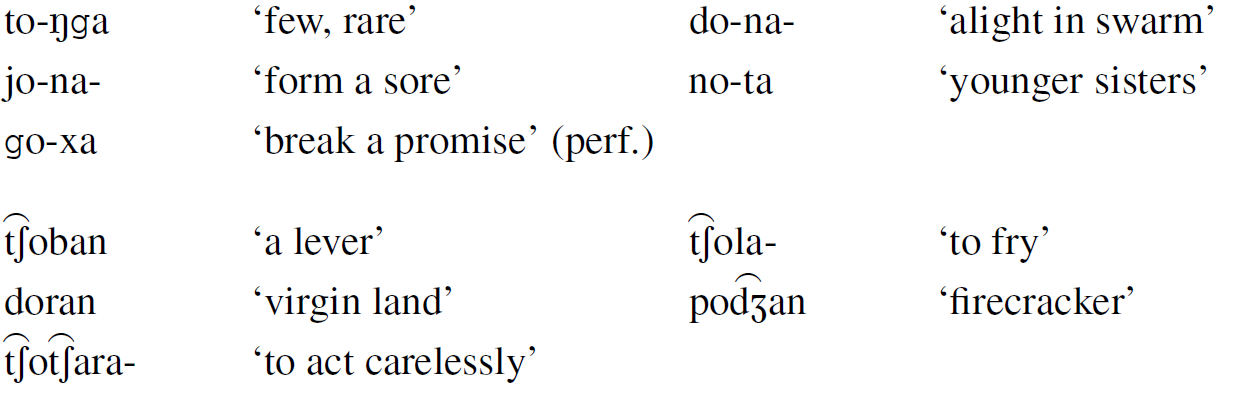
* [o] may occur non-initially only when it is in a harmonic span ([o o o …]).
* This is an intriguing possible argument for autosegmentalism (“[+round] autosegments must be linked to the first syllable”).
* It could also simply reflect a version of Agree? \*[−round][+round]

# Preceding /o/ is a necessary, not *sufficient* condition for noninitial /o/

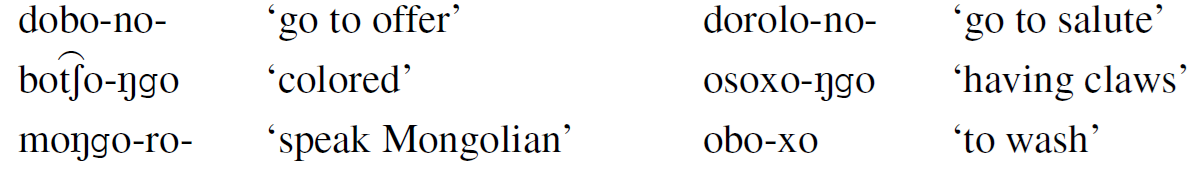


# A single /o/ does not suffice to induce rounding on a following low vowel

* This holds true both for affixed forms and for roots:



# /o o/ (and longer) *is* a harmony trigger for suffixes

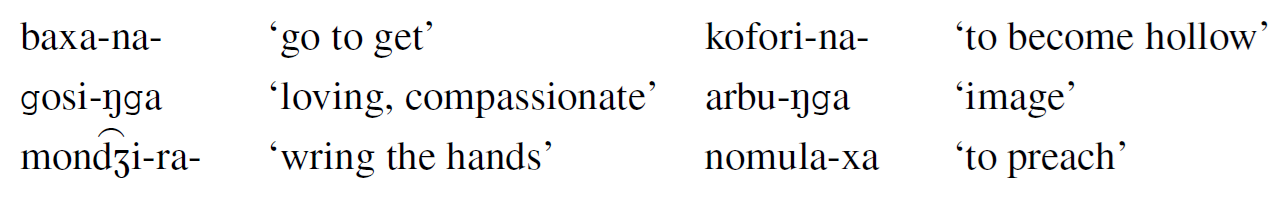


# There are /o o o/ stems



* Also, I believe [o a o] is ill-formed, though there is no direct confirmation.

# No vowel is transparent



# Inputs and candidates

|  |  |  |  |
| --- | --- | --- | --- |
| /o/ | ☞ | o | Rounding is phonemic. |
|  |  | a |  |
| /o a/ | ☞ | o a | No harmony with single trigger. |
|  |  | o o |  |
|  |  | a a |  |
| /a o/ | ☞ | a a | No non-initial [o] not licensed by preceding [o]. |
|  |  | a o |  |
|  |  | o o |  |
| /i o/ | ☞ | i a | No non-initial [o] not licensed by preceding [o]. |
|  |  | i o |  |
|  |  | u o |  |
| /o o/ | ☞ | o o | Licensed /o/ is legal. |
|  |  | o a |  |
|  |  | a a |  |
| /o o o/ | ☞ | o o o | Ditto, for longer words |
|  |  | o o a |  |
|  |  | o a a |  |
|  |  | a a a |  |
| /o o a/ | ☞ | o o o | Double-trigger harmony |
|  |  | o o a |  |
|  |  | o a a |  |
|  |  | a a a |  |
| /o a o/ | ☞ | o a a | The double trigger cannot be flanking [o]’s. |
|  |  | o o o |  |
|  |  | o a o |  |
|  |  | a a a |  |
| /o o i/ | ☞ | o o i | Other vowels do not participate in rounded harmony. |
|  |  | o o u |  |

# BH experience working on this

* I would love to get this as a gang effect but have not succeeded.
* I conjecture that initial vowels are stressed and that postinitial round vowels are “Bad Vowels” in Kaun’s sense.
* A particular dilemma for gangism here is this comparison:
* /o o a /  [ o o o ], reducing Agree-distance-2 by one, Agree-distance-1 by one
* /o a a/  [ o a a ], not \*[ o o o ], which would do the same thing.

# Software note

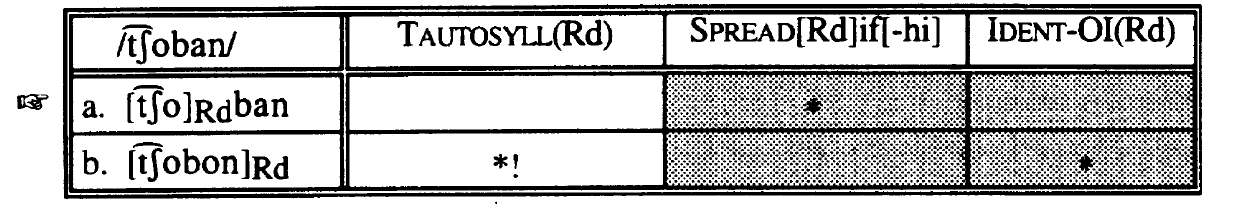
* Every OT analysis has a MaxEnt translation.
* But the Solver cannot find the (quite high) weights needed to translate (at least my) OT analysis.
* Even stranger, my own, exceedingly primitive MaxEnt implementation in OTSoft succeeds.
* Not clear what is going on.

# Walker’s analysis of Manchu

* Ident(round) in initial syllables
* Spread [round] if [–high] (penalize for every vowel a [+round] does not link to)
* CrispEdge(round): penalize cases where [+round] crosses syllable boundaries.

Crispness keeps you from spreading from a single rounded vowel:

Crisp

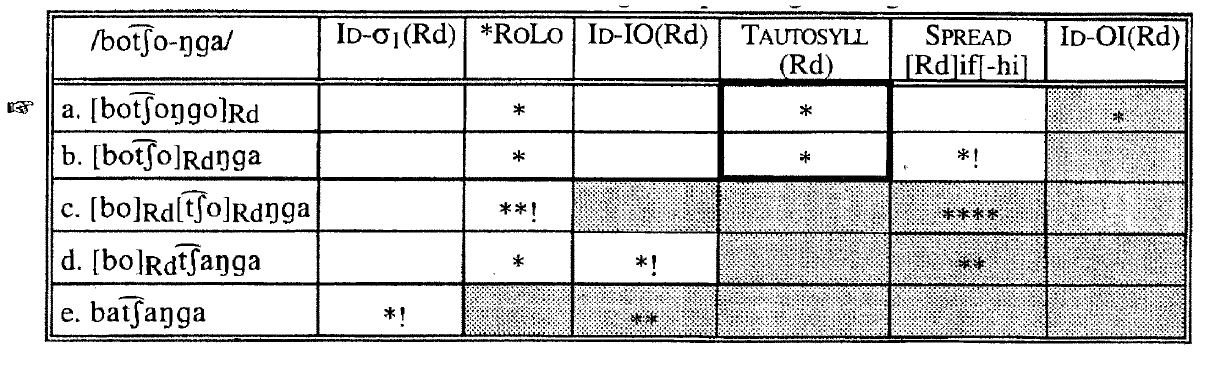


But if you already have two, you’re already uncrisp, so you spread:

Id(– +)

Id(– +)

Crisp



* I’d like to see more cases where Crisp alone determines distribution.

keeping our heads above water: what criteria can be used to evaluation proposals about vowel harmony?

part i: providing sufficient power

# Control mechanisms

* Stem control
* Dominant harmony
* Directional harmony

# More on directionality

* Mechanisms to permit LR, RL, and bidirectional harmony in cases that are
* allophonic (Faithfulness can’t help)
* phonemic (Faithfulness can help)

# Direction-specific blocking

* … if, contra McCarthy, it exists

# Iterativity

* Noniterativity is often not even considered vowel harmony, though it seem that many of the same principles should obtained.
* Jinyoung pointed out to us that Korean vowel harmony is noniterative.

# Differences between stem harmony and affix harmony

* Sometimes stem harmony is stricter (Turkish).
* Sometimes affix harmony is stricted (Wolof).
* So clearly there is more than one mechanism.

# Classifying the logically possible stem types

* Perfectly good stems
* Marginal stems, repaired by bumpkins or in unguarded speech
* Imperfect stems, felt to be such (?? need test) but not repaired
* Bad stems, felt to be impossible in the language
* Later: role in speech segmentation, both learning and on line

# Trigger conditions

* Stating them
* Explaining typological tendencies, e.g. “spread bad vowel”[[1]](#footnote-1)

# Opacity

* Opaque vowels, characteristically low
* Opaque consonants, like [lʲ] in Turkish.

# Transparency

* Mechanisms to permit skipping of transparent vowels
* Transparent vowels tend to be high

# Translucency

* Found when we do probabilistic analysis on systems with variation
* distance effects
* effects of height of intervener

# Favoring like-becomes-more-like

# Trojans

* McCarthy says nothing about them.

# Uniformity of suffixes in multi-suffix forms

* This is underinvestigated.
* We toy with inflectional classes to deal with the only documented case I know of, Hungarian.

# Gradient harmony and phonetic clines

* Seen in Diola, also Akan

part ii: Not providing excessive power

# Myopia

* Unless the myopia cases really exist (Walker, Stanton), in which case this turns into a “sufficient power” argument for the complement class of theories.

# Majority rules

* More on this later with Warlpiri

# Too-Many-Solutions

* See the huge cage full of nightmares put forth in the McCarthy article
* We reserve the possibility of explanation by
* poor language sample so far
* diachronic explanation

more on mccarthy’s harmonic serialist account of harmony

# Agree could not possibly work in Harmonic Serialism

* Try this out with /m-ajapa/, Agree(nasal), and \*Ṽ.

# Share()

* Make every feature privative (uni-valued), per much ancient history.[[2]](#footnote-2)
* Let us speak of the active value (e.g [+round], [+nasal]) of the feature.
* The new revised Agree():
* Assess a penalty for every adjacent segment-pair whose member **are not both [αF]**, where α is the active value.

# What we have so far about Share()

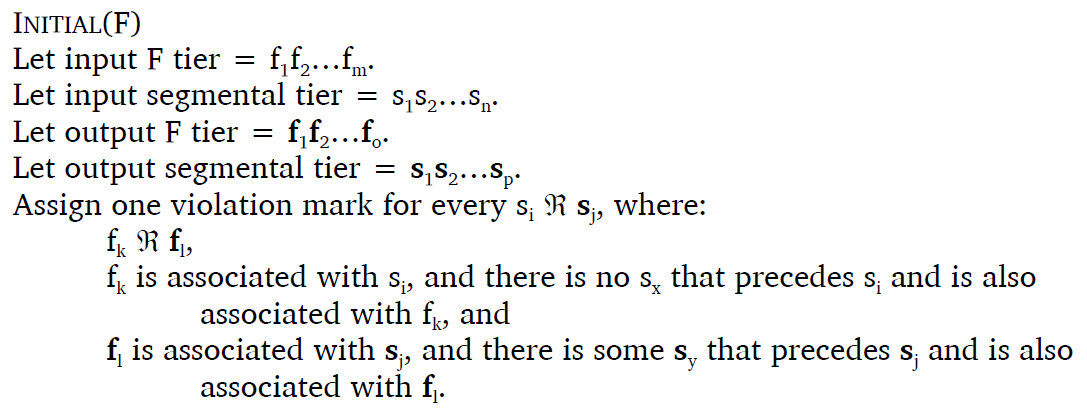
* It is myopic: the desire for abundance iteratively turns one into two, iteratively.
* It won’t force every polysyllable to be nasal, due to local search.
* It won’t make every vowel [+ATR] in a dominant harmony system, due to local search.

# Implication

* All putative cases of *non*-myopia should be scrutinized carefully from the viewpoint of this theory, querying both the constraints used and perhaps the whole framework …

# Another element: directionality with Faithfulness

* McCarthy states, with characteristic care, a Faithfulness-based implementation of directionality:



(and analogously for Final(F))

* Sorry, I would have cited this in earlier discussion if I had remembered it.
* I feel this cannot be the whole story, for harmony is sometimes allophonic (e.g. nasality in Johore Malay)
* Faith cannot help you
* … because of the rich base, which we ought to test for this theory

# McCarthy’s arguments based on restrictiveness

* They are similar to the 2004 paper with spans, focusing on Myopia and Too-Many-Solutions.
* There are a *lot* of pathologies given, but the argument is essentially the same: local search can’t reach the pathological candidate.
* For Too-Many-Solutions: Epenthesis, affix ordering, allomorph selection, deletion, stress shift

# Transparent vowels

* He mentions this for concreteness.
* There are two theories that could be used:
* Aberrant phonetic cash-out ([+back] linked to i in Hungarian is [i]).
* Gapped spans

# Direction-specific blocking

* This is a whole topic that we should probably address separately.
* Direction-specific blocking is predicted to exist in Humble Phonology, which can place featural restrictions on either the left or the right side of an Agree constraint.
* McCarthy takes the view that direction-specific blocking does not exist, and if it does his theory is not right.

comments on the theory

# The theory is completely dependent on single-valued features

* This is an ancient controversy.
* People tend to be comfortable with univalued:
* [+nasal]
* [+round]
* various consonant features
* Less so with
* [back]
* [ATR]
* vowel height features

# Samples

* Hungarian: mostly back in [Bi] stems, mostly front in [Bɛ] stems; all front in [i] or [ɛ] stems.
* … suggesting B wants back, i and ɛ want front in varying degrees.
* Turkish
* The consonant effects we covered indicate that the “real” feature has to be [front]
* Yet [ɯ] doesn’t like to combine with front vowels; how to single it out for a constraint?
* Nasal contours
* processes like Ṽd  Ṽn͡d imply values for both + and −.
* Tonal contours
* Analogous processes are commonplace: H  rise / L \_\_\_, implying values for both [+HiPitch] and [−HiPitch].[[3]](#footnote-3)

# What McCarthy (briefly) says about these

* “The best cases against privativity can be made for [ATR] and [back] … but in both cases we are probably dealing with two binary features …: [ATR] versus [RTR], and [back] versus [front].”
* This raises unanswered questions such as:
* How does spreading create contour segments when the phonetic dimension is split into separate features?
* What is the system for coordinating independent features governing the same phonetic dimension?

# What might be the sort of derivation we get for vowel harmony with two backness         features?

* Assume that the “hot” value is [front].
* Given the principle of minimal edits, the derivation will create intermediate representations of the form [front, back].
* The next step is to fix [front, back] to [front, ∅].
* But this means that the (universal?) constraint \*[front, back] can be ranked below a language-specific constraint like Share.
* Further thought on this topic might be helpful …

# Might Share erroneously trigger deletion?

* This is discussed to some extent in the article but it’s not clear to me that all cases have been covered.
* Consider this ranking: Share >> Max >> Ident(nas)
* Let a *pair* of consecutive oral segments explain themselves: “If we can’t *both* be nasal, and changing the nasality of just *one* of us won’t help, then one of us has to be deleted!”
* This could lead to trouble — e.g. truncation of certain all-oral words down to just one segment.
* We need to make the argument with care:
* Embellishment: Segments delete only gradually in Harmonic Serialism; you first remove their Place specifications, then delete the debuccalized residue (McCarthy : The gradual path to cluster simplification, *Phonology* (2008)).
* I will use “H” to denote a debuccalized residue and place these H’s in the UR. They might plausibly surface, when not deleted, as [h].
* For good measure, I will use “ə” to denote the minimal entity that still qualifies as a vowel; specifically, it may be deleted in a minimal path.
* Claimed data pattern for this impossible hypothetical language:

/əHə/  [ə] ‘duck’

/n-əHə/  [nə̃H̃ə̃] ‘ducks’

* In general: “delete all but one segment in a word consisting of minimal-type segments, unless it forms a nasal span.”
* Tableaux (1, 2, 3 … indicate stages of the Harmonic Serialism derivation):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| /əHə/ | Share | Max | Ident (nasal) | Comment |
| 1. Hə >> əHə | \* vs. \*\* | \* vs. none |  | Killing a vowel removes a Share violation |
| Hə >> ə̃Hə | \* vs. \*\* |  | \* | Nasalizing one vowel doesn’t help re. Share. |
| 2. ə >> Hə | none vs. \* | \* vs. none |  | Same as at first stage. |
| 3. ə  |  | \*\* vs. \*\*\* |  | Now it’s ok to keep the vowel; only pairs violate Share. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| /n-əHə/ | Share | Max | Ident (nasal) | Comment |
| 1. nə̃Hə >> nəhə | \*\* vs. \*\*\*! |  | \* | with one nasal in place, you can improve re. Share by spreading, a cheaper solution |
| nə̃Hə >> nəh | \*\* vs. \*\* | \*! |  |  |
| 2. nə̃H̃ə >> nə̃Hə | \* vs. \*\*! |  | \* | ditto |
| nə̃H̃ə >> nə̃H | \* vs. \* | \*! |  |  |
| 3. nə̃H̃ə̃ >> nə̃H̃ə |  vs. \*! |  | \* | ditto |
| nə̃H̃ə̃ >> nə̃H̃ |  | \* |  |  |

# What does Share-cum Harmonic Serialism say about stem well-formedness?

* Toy (but representative) language, with ATR harmony and marginally-permitted disharmonic stems
* Speakers tolerate them and adopt new ones in loanwords.
* Here are some schematic stems with their harmony scores for Share, assuming [+ATR] as the active value.

*Form Violations of Share*

a. e e e e e e 0

b. ɛ ɛ ɛ ɛ ɛ ɛ 5

c. e ɛ ɛ ɛ ɛ ɛ 5

d. e e ɛ ɛ ɛ ɛ 4

e. e e e ɛ ɛ ɛ 3

f. e e e e ɛ ɛ 2

g. e e e e e ɛ 1

h. e ɛ ɛ ɛ ɛ e 5

i. e ɛ e ɛ e ɛ 5

* Suggestion: these are very unlikely to correspond with gradient well-formedness intuitions about stems.
* Mechanism: in Share theory, ɛ ɛ ɛ ɛ ɛ ɛ is horribly disharmonic (in the OT sense of the term), but it is saved by the mechanism of local search.
* Conclusion (?): Share theory is tightly bounded to the Rich-Base conception of phonotactics: you either survive, or get repaired.
* This theory is weak at the task of capturing the existence of marginal-but-never-repaired forms.

# Same candidates assessed under Agree (local)

*Form Agree*

a. e e e e e e 0

b. ɛ ɛ ɛ ɛ ɛ ɛ 0

c. e ɛ ɛ ɛ ɛ ɛ 1

d. e e ɛ ɛ ɛ ɛ 1

e. e e e ɛ ɛ ɛ 1

f. e e e e ɛ ɛ 1

g. e e e e e ɛ 1

h. e ɛ ɛ ɛ ɛ e 2

i. e ɛ e ɛ e ɛ 5

# Candidates assessed under Align(+ATR, right)

*Form Align*

a. e e e e e e 0

b. ɛ ɛ ɛ ɛ ɛ ɛ 0

c1. e ɛ ɛ ɛ ɛ ɛ 5

c2. ɛ e ɛ ɛ ɛ ɛ 4

c3. ɛ ɛ e ɛ ɛ ɛ 3

c4. ɛ ɛ ɛ e ɛ ɛ 2

c5. ɛ ɛ ɛ ɛ e ɛ 1

c6. ɛ ɛ ɛ ɛ ɛ e 0

d. e e ɛ ɛ ɛ ɛ 4

e. e e e ɛ ɛ ɛ 3

f. e e e e ɛ ɛ 2

g. e e e e e ɛ 1

h. e ɛ ɛ ɛ ɛ e 5

i. e ɛ e ɛ e ɛ 5

kevin ryan on nati

# Reference (readings)

* Ryan, Kevin. "Attenuated spreading in Sanskrit retroflex harmony." *Linguistic Inquiry* 48, no. 2 (2017): 299-340.

# Some cute preliminary things about nati

* Short /a/ in Sanskrit is [ʌ], so call it “nutty” (but don’t tap …).
* Linguists everywhere get confused and think *nati* means “ɳ-ification” so they spell/pronounce it with [ṇ]. Don’t.[[4]](#footnote-4)

# High spots in the Ryan paper

* Phonetic realism buys you something: [VɳV] is really [Vɳ͡nV], and on the right side /ɳ/ indeed an alveolar.
* Real, non-gradient, phonological ganging.
* An application of the McCarthyan Share to a complex harmony system.

# Other general observations

* Ryan is a modernist, with searches of a big data corpus.
* Ryan (following others, such as Hansson) engages in the same sort of phonetic reconstruction that Stanton has done for Gurindji: hypothesized real phonetic spans of retroflexion on vowels, inferred by their consequences for

# Basic rule-like description

* Change

n  ɳ

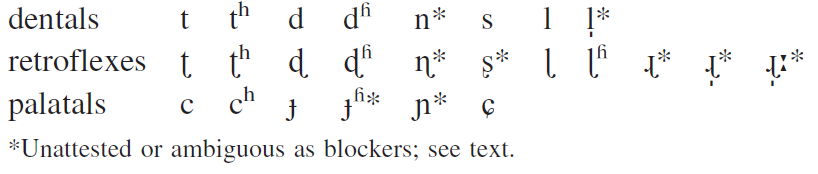
* Trigger

Retroflex continuants: ɻ, ɻ̩̩, ɻ̩̩ː, ʂ, somewhere to the left

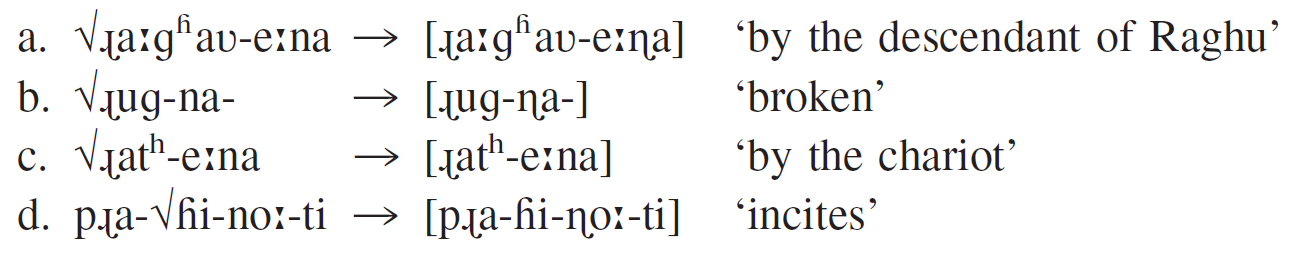
* Accompanying hypothesis

All intervening segments undergo, including vowels, velars, labials

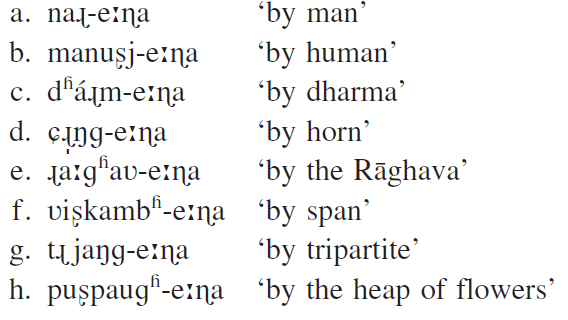
* Blockers:



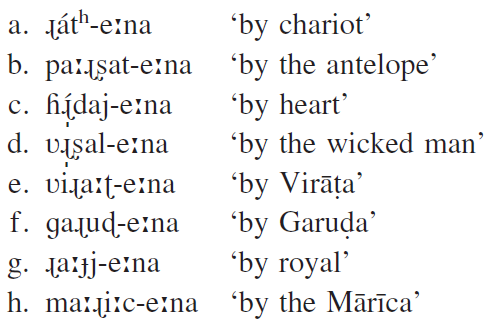
* Examples



# Examples of nonblocking consonants



# Examples of blocking consonants



# Flapping out

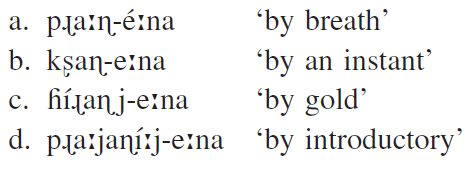
* Even newbies learning to say these things will realize that “[aʈa]” is, in full detail, [aʈ͡ta].
* This is documented in phonetic work on real languages.
* Steriade, in classical work on phonetically-based phonology, uses this as a poster child: retroflexes are uniquely better-cued on their left, and like to be postvocalic.
* Steriade, Donca. 1995. Positional neutralization. Ms., UCLA, Los Angeles, CA.

# Which retroflexes flap out?

* It would seem: stops and nasals, but not liquids or fricatives.
* Try it yourself.

# Things Ryan gets by taking flapping-out seriously

* Nati, a left-to-right process, is triggered only by continuants, not by stops or nasals.
* Indeed, retroflex stops are blockers.
* An explanation for why [ɳ] is the output of Nati but cannot trigger it!



* It would have been nice to have a form like /pɻap-nap-eːna/  [pɻap-ɳap-eːna/ but I guess these are not available.
* An explanation for why Nati is left-to-right
* If right-to-left, then the target nasal would be true [ɳ], not the actual [ɳ͡n].

# Issues of implementation

* If this were the 1980’s, Ryan would almost certainly be trotting out a fully-autosegmental representation for flapped-out segments:

T docking site, of some sort

− + tier for [anterior]

Perhaps the vexed history of feature geometry lead him to not plunge in here.

# Why are only nasals targets?

* This is pretty standard in phonetically-based phonology.
* Nasals are poorly cued for place because the neighboring vowels suffer from nasality coarticulation.
* Typology of cluster assimilation supports, I believe, the greater assimilability of nasals.

stop here

# What would it take to do this in Agree?

* Recall the main difficulty, i.e. enforcing Myopia.
* The only way we have thought of to do this is the Stantonian way: enforce Agree precisely among undergoers.
* So constraint ranking cannot be used to identify blockers.
* The left-side of Agree is easy: it is a true (“right-side”) retroflex.
* This is Ryan’s insight about Flapping Out.
* Here are the undergoers, which must appear on the right side of Agree:
* Vowels
* Non-coronal consonants
* n
* In contrast, the Share-cum-Harmonic Serialism approach that Ryan adopts can block spreading with ordinary Faithfulness (Ident(anterior) in obstruents) or markedness constraints (\*retroflected palatal)

# An aside: a good moment *not* to feel nostalgic for rule-based phonology

* A rule of the type

 [−anterior] / [−anterior] \_\_\_

is the equivalent of the Agree analysis.

* A rule of the type:

[+segment]  [−anterior] / [−anterior] \_\_\_

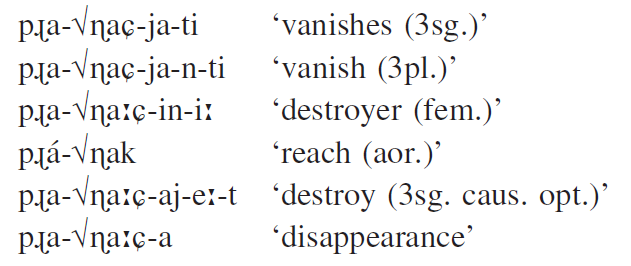
with overriding conditions:

* don’t change anteriority of obstruents
* don’t create a retroflected coronal

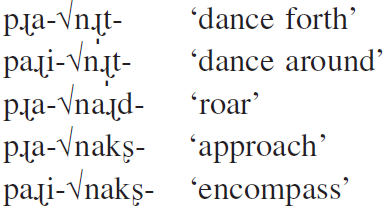
is more like Ryan’s analysis, but it brings back the vexed question, “how do constraints govern the derivation?” that OT was invented to solve.

# There is evidence for right-to-left spreading

* Again, it is indirect, based on what is preserved in the orthographic record.
* Under certain morphological circumstances, Nati is blocked by a retroflex.
* Compare:
* yes application:



* no application[[5]](#footnote-5):



# How to get this

* Assume bidirectional spreading, and ban C X

− + − [anterior] tier

This is exactly like the nasal constraint noticed by Stanton for Gurindji: NCṼ, with quick back-and-forth.

# Key forms, morphology ignored (all schematic)

* Let us use capitalization for retroflexion.
* Nn, Tt represent the contour segments of retroflexion on a [−continuant] consonant.

Simple application: S a p a - n a  S A P A Nn a

Stops not triggers: Tt a p a - n a  same

Coronals block: S a t a - n a  S A t a n a

Retroflexes block: S a Tt a - n a  S A Tt a n a

Palatals block: S a c a - n a  S A c a n a

Nati does not chain (Nn is not a trigger): S a n a - n a  S A Nn a n a

Nati per se does not apply right to left: a n a S a  a n A S A (inferred output)

Blockage (see more below) in clashing spans:

S a n a S a  S A n A S a

1. McCarthy suggests that “spread bad vowel” seems to work better for rounding harmony than for ATR harmony. [↑](#footnote-ref-1)
2. N. S. Trubetzkoy, working in the 1920’s, had already conceptualized the distinction of univalued (privative) features and two-valued (“equipollent”) features. [↑](#footnote-ref-2)
3. This raises the scary point that there is a great deal of “tone harmony” in the world (a.k.a. “tone spreading”), formally analogous to vowel harmony but neglected by us completely so far … [↑](#footnote-ref-3)
4. “Ṇati” is thus part of the silliness-activity seen in methatesis, apocop, syncpe, haplogy, epenethesis. [↑](#footnote-ref-4)
5. If the theory is right the blockers should include stops, but he doesn’t mention this and suggests in fact that stops are *not* blockers. [↑](#footnote-ref-5)