

Verb Root Shape in Yokuts: a Consequence of Morphological and Prosodic Structure

PETER ARA GUEKGUEZIAN

UNIVERSITY OF SOUTHERN CALIFORNIA

NELS 45 – MIT, NOVEMBER 1ST, 2014

EMAIL: GUEKGUEZ@USC.EDU

Question

What are the consequences of **syntactic structure** in the word for **phonological processes** in the word?

Proposal

Syntactic material spelled out at the vP phase is sent to the phonology before other material → spelled-out material forms a **phonological constituent** (the stem)

Novel Claim: Prior spellout of vP material can result in **templatic** effects in the stem due to **minimality**

General Implication: possible cross-linguistic homology between boundaries in syntax (phases) and boundaries in phonology (stem and word edges)

Outline of Presentation

I focus on a process of verbal morphophonology in a single language, **Chukchansi**, a member of the **Yokuts** language family

- **Introduction:** the Phenomenon and the Proposal
- **Morphosyntactic Structure:** Phases
- **Phonological Effects:** Minimality

All data collected by the researcher and colleagues at California State University, Fresno

Root Shape Change in Chukchansi Yokuts

Phenomenon: **root shape change** in Chukchansi

Verb roots change shape when certain suffixes attach

Root	No Shape Change	Shape Change
/ʃawg/ 'buy'	[ʃaw.g-eʔ] 'will buy'	[ʃa.wa:.g-itʃ] 'buyer-NOM'
/k'a:mn/ 'dry'	[k'a:.min.-hil] 'dried'	[k'a.man.-ʔa-n'] 'is drying'
/lihm/ 'run'	[lih.m-im.x-it] 'just ran with X'	[le.he:.m-e-t] 'just made X run'

Main Questions

This phenomenon spurs two related questions:

- 1) What motivates these roots to change their shape?
- 2) What determines which suffixes correlate with root shape change?

Proposal

I propose principled answers grounded in morphosyntactic and prosodic structure

Root shape change is triggered by suffixes that are **vP-level phase heads**

All root shape change is to the preferred **LH iambic foot**

- **Minimality** combined with iambic parsing give one-vowel inputs an LH iamb in the output

Previous Accounts

In previous accounts of similar phenomena in the Yokuts language Yowlumne (e.g., Kenstowicz + Kisseberth 1979, Archangeli 1983, 1991, Zoll 1993, inter alia):

- Verb roots choose from set of prosodic templates
- Some suffixes impose a template chosen from this set upon roots

No **principled** means to determine

1. the set of template-imposing suffixes, or
2. which template is chosen by which suffix

Theoretical Underpinnings

Syntax builds up structure and sends it to the interfaces (PF and LF) cyclically at **phases** (e.g., Uriagereka 1999, Chomsky 2001a,b)

Words are **built in the syntax** (morphemes = bundles of syntactic features); Lexical Insertion spells out phonological exponents of these morphemes (Distributed Morphology, e.g., Halle and Marantz 1993, Marantz 2001)

Prosodic structure demands that each phonological output is a **Minimal Word**, which must contain a stress Foot (Selkirk 1984, Nespor and Vogel 1986)

Verbal Morphology

Chukchansi verb morphology: **root**, obligatory final suffix, and optional non-final suffixes in between

Subset of non-final suffixes trigger root shape change

- **Trigger suffixes** are always closer to the root than **non-triggers**

Verb Structure: **ROOT**-(**SFX**_{Trigger})-(**SFX**_{Non-Trigger})-**SFX**_{Final}

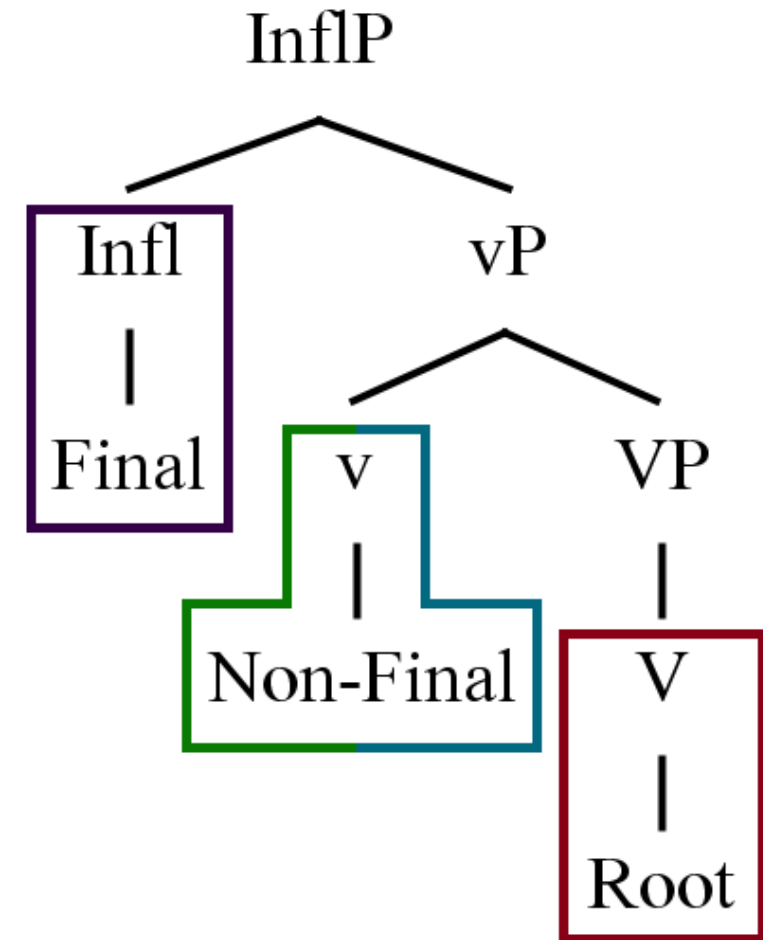
- [**lihm-it**] [**lehe:m-e-t**] [**lehe:m-e-wf-it**]
- run-REC run-CAUS-REC run-CAUS-RFLX-REC
- ‘just ran’ ‘just made X run’ ‘just made oneself run’

Morphosyntax of Suffixes

Final and non-final suffixes
encode different syntactic categories

- Final suffixes: tense, mood, non-finite subordination (gerunds)
- Non-final suffixes: voice, aspect, derivation

Final suffixes are **syntactically higher** (in Infl) than non-final suffixes (in vP domain between Infl and verb root)



Triggers vs. Non-Triggers

Trigger and non-trigger suffixes encode similar categories (voice, aspect, nominalization)

Proposal: these suffixes are in fact syntactically different

	Trigger Suffixes	Non-Trigger Suffixes
Voice	Causative	Unaccusative, Passive, Reflexive, Benefactive, Comitative
Aspect	Inchoative, Durative, Distributive	Imperfective, Processive ('go X-ing')
Nominalization	Agent, Adjunct (Instrument or Location)	Object, Activity

Triggers = Phase Heads

Generalization: Voice and nominalization triggers have an active/causative element, which non-triggers lack

Proposal: This element is the phase head v_{CAUSE} (= transitive v^* in Chomsky 2001a,b)

- v_{CAUSE} is only strong phase head in this position; other v heads (unaccusative, passive, reflexive, applicatives) are not phase heads (Chomsky 2001a,b; cf. Legate 2003)

As phase head, v_{CAUSE} sends complement (VP) to interfaces, PF and LF (Chomsky 2001a,b)

Phase Head v_{CAUSE}

v_{CAUSE} adds **external argument** and assigns **Accusative Case** to object

v_{CAUSE} is present in unergatives (one argument), transitives (two arguments) and causatives (three arguments)

Unergative:	bewn-eʔ	naʔ			“I will sew”
	sew-FUT	I.NOM			
Transitive:	bewn-eʔ	naʔ	kami:sa-ʔan		“I will sew a shirt”
	sew-FUT	I.NOM	shirt-ACC		
Causative:	bewe:n-e-nʔ	maʔ	nan	kami:sa-ʔan	“You will make me
	sew-CAUS-FUT	you.NOM	I.ACC	shirt-ACC	sew a shirt”

Causatives have **two** $v_{\text{CAUSE}}^s \rightarrow$ two external arguments, two Accusative Cases

v_{CAUSE} in Different Morphemes

Difference between unergatives/transitives and causatives:
morphological spellout of v_{CAUSE} heads

Unergatives/transitives: v_{CAUSE} spelled out with root

- Root head-moves from V to v_{CAUSE} \rightarrow not in complement of v_{CAUSE}
- Phonological “root” is exponent of both lexical root and v_{CAUSE}

Causatives: additional, higher v_{CAUSE} spelled out by separate causative morpheme

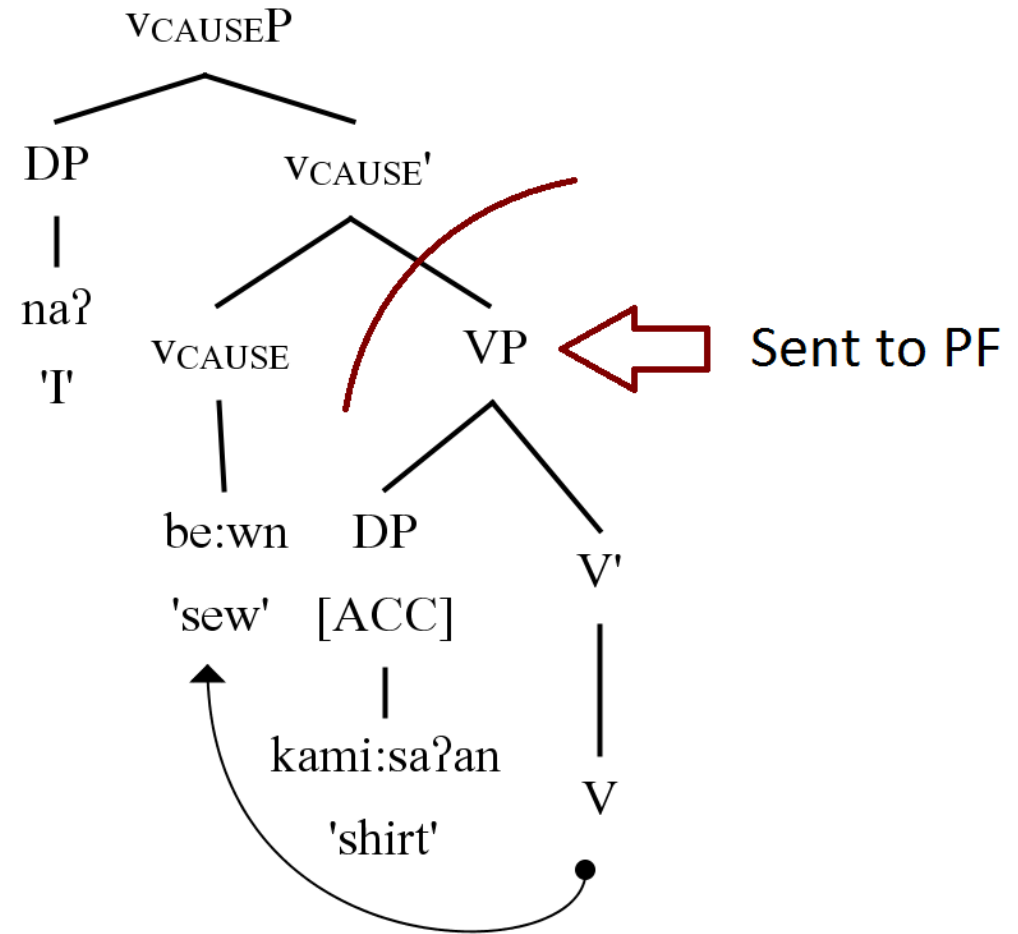
- Lexical root moved to lower v_{CAUSE} lies within higher v_{CAUSE} 's complement \rightarrow root + lower v_{CAUSE} **sent to interfaces**

Transitive: Root not Sent to PF

bewn-e? na? kami:sa-ʔan

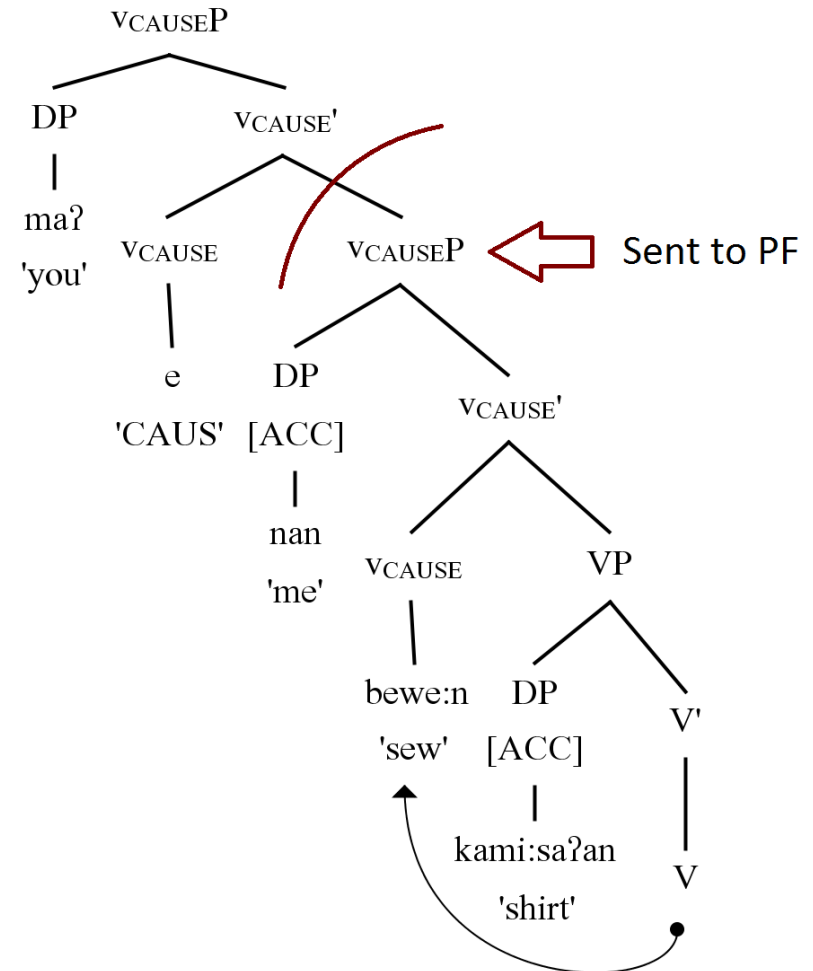
sew-FUT I.NOM shirt-ACC

“I will sew a shirt”



Causative: Root Sent to PF

bewe:n-e-n' ma?
 sew-CAUS-FUT you.NOM
 nan kami:sa-ʔan
 I.ACC shirt-ACC
 “You will make me sew a shirt”



Voices and Nominalizers

Other little v heads (unaccusative, passive, reflexive, applicatives) → not phase heads (no external argument added or Accusative Case assigned) → root not sent to PF

Claim: Nominalizers in Chukchansi spell out both little v and a category-changing n head

Agentive (actor) and adjunctive (instrument or location actor uses) nominalizers include v_{CAUSE} → send root in complement to PF

Other nominalizers (activity or object nominals) → other little v heads (not phase heads) → root not sent to PF

Aspect Heads

Some aspect suffixes are triggers, some non-triggers

- Triggers: inchoative, durative, distributive
- Non-triggers: imperfective, processive 'go X-ing'

Claim: trigger aspect suffixes → vP-internal Situation Aspect; non-trigger aspect suffixes → vP-external Viewpoint Aspect (see, e.g., Smith 1991, Travis 2000)

Situation Aspect remains visible to interact with higher Viewpoint and Tense heads → phase head (sends root to PF)

Viewpoint Aspect outside vP (in Infl domain) → not phase head

Consequences of Spellout

Syntactic material sent to PF → Lexical Insertion spells out **morphophonological exponents** (Distributed Morphology)

- These exponents are then manipulated by the phonology

Proposal: if some syntactic material (**A**) is sent to PF before other material (**B**), its morphophonological exponents (**a**) also enter the phonology before the latter's (**b**)

- Syntax: $A > B \rightarrow$ Phonology: $a > b$

Consequences of Spellout

Roots spelled out at **vP phase** go through phonology first

Suffixes and roots spelled out at **CP phase** go through phonology afterwards

Verbs **cyclically spelled out**, e.g., Chomsky and Halle (1968), Kiparsky (1982), with cycles = **syntactic phases**

[[Cycle 1]_{vP} Cycle 2]_{CP}

lambs in Chukchansi

Proposal: Root shape change is a phonological effect of cyclic spellout due to **prosodic parsing** and **minimality**

Chukchansi has **left-to-right iambic** parsing

- Shown by stress, vowel epenthesis, and root inventory

Stress: words ideally have initial H or LH Feet

- /ale:dʒa-n'/ 'is crazy' → [(?a.lé:).dʒan']
- /ade-ʃt-e?/ 'will bring for X' → [(?a.déʃ).te?]
- /k'a:bo-ta?/ 'had caught' → [(k'á:).bo.ta?]
- /ale:dʒa-la-wʃ-it/ 'just made oneself crazy' → [(?a.lé:).(dʒa.láw).ʃit]

lambs in Chukchansi

Vowel epenthesis: repair of consonant clusters results in initial LH foot (optimal iamb, e.g., Prince 1991, Kager 1993)

- /lihm-taʔ/ 'had run' → [(li.hím).taʔ], *[(líh).mi.taʔ]

Root shape inventory: Vast majority of verb roots either shapeless, or easily parsed into H or LH (**iambic**) sequences

- Very few roots in lexicon that would be parsed into LL sequences (bad iambs, e.g., Kager 1993, Hayes 1995)

Root Shape Change: LH iambs

Claim: all root shape change results in an **LH iamb**

- /**tʃi**-la-taʔ/ ‘had made X cut’ → [(**tʃi**.**ʃa:**).la.taʔ]
- /**ma:x**-tʃ'-i/ ‘collector-ACC’ → [(**ma**.**xa:**).tʃ'i]
- /**gays**-a-n'/ ‘gets better’ → [(**ga**.**ye:**).san']
- /**be:wn**-e-t/ ‘just made X sew’ → [(**be**.**we:**).net]

Other root shape changes are “rare,” “not productive” (Newman 1944), severely morphologically restricted, or due to independent phonotactic reasons

Phases and Minimality

All lexical words minimally contain one stress foot (Selkirk 1984, Nespor and Vogel 1986)

Claim: requirement enforced throughout derivation, resulting in a **minimality** effect for sufficiently small inputs

Root (bundle of syntactic features) sent to PF at vP phase →
Root (phonological exponent) enters phonology first (see e.g., Marvin (2002), Newell (2008))

Output root by itself (Cycle 1) must contain a **stress foot**

Epenthesis and LH iambs

Input has one vowel → second vowel epenthesized to form **LH iamb**

Claim: LH iamb more well-formed than H iamb → material added to create LH (see Prince 1991, Kager 1993 for LH as optimal iamb)

This is captured by the ranking FootForm >> Dep-V

Parse- σ requires the output to contain a foot

/L/	Parse- σ	FootForm	Dep-V
→ (L'H)			*
('H), (L'L)		*!	
L	*!		

H Roots and LH iambs

H inputs also receive an LH iamb:

- /ma:x-/ → [(ma.xa:)-]; /be:wn-/ → [(be.we:).n-]

Claim: this derivation is only epenthesis of a mora, not alteration of input mora associations

Pressure to create an LH foot (FootForm) outweighs Dep- μ

/H _{μμ} /	FootForm	Dep- μ
→ (L _μ 'H _{μμ})		*
('H _{μμ})L _μ	*!	*
('H _{μμ}), (L _μ 'L _μ)	*!	

Larger Roots: No LH lamb

Larger inputs do not disturb input mora association to please FootForm

- HL input (either root or word) → HL output (not *LH)

High-ranked Max- μ and Faith- μ Link prevent mora deletion or rearrangement to derive an LH output

Claim: H and LH roots → input morae need not associate to vowels; but HL roots → input morae must associate

- Grammar parses roots with 2 or 3 input morae into **H** and **LH** outputs, but not into **HL** outputs

Larger Roots: No LH lamb

- HL /**be:le-**/ → [(**be:**).**le-**], *[(be.le:)-]

$/H_{\mu\mu}L_{\mu}/$	Max- μ , Faith- μ Link	FootForm
$\rightarrow ('H_{\mu\mu})L_{\mu}$		*
$(L_{\mu}'H_{\mu\mu})$	*!	

- HH /**hayk'it-**/ → [(**hay**).**k'it-**], *[(ha.ya:).k'it-]

$/H_{\mu\mu}H_{\mu\mu}/$	Max- μ , Faith- μ Link	FootForm
$\rightarrow ('H_{\mu\mu})(H_{\mu\mu})$		*
$(L_{\mu}'H_{\mu\mu})$	*!	

Non-Shape Changing Suffixes

Root not spelled out at vP phase → sent to PF with suffixes at **CP phase**

- These include both non-final (vP) and final (Infl) suffixes

Inputs with root and suffix(es) → always enough phonological material to form a Foot without epenthesis

- Roots spelled out at CP phase → **no shape change**

Non-Shape Changing Suffixes

Root + suffix inputs cannot delete, epenthesize, or rearrange material to form LH output

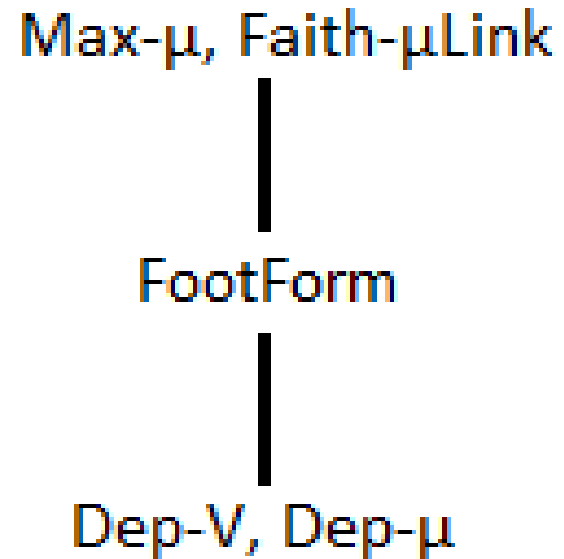
- /**tʃiʃ-ta?**/ ‘had cut’ → [(**tʃiʃ**).**ta?**], *[(tʃi.ʃa:).ta?]
- /**ma:x-e?**/ ‘will collect’ → [(**ma:**).**xe?**], *[(ma.xa:).?e?]

Vowel epenthesis to repair consonant clusters can result in an LH iamb, but cannot alter existing moraic structure

- /**lihm-ta?**/ ‘had run’ → [(**li.him**).**ta?**], *[(lih).mi.ta?]
- But, /**be:wn-hil**/ ‘sewed’ → [(**be:**).**win.hil**], *[(be.wen).hil]

LH iambs: the Complete Story

Preference for **LH iambs** →
epenthesis in roots with one
input vowel; constraints against
changing input structure →
no epenthesis in larger roots



This ranking only produces root shape change with
sufficiently small inputs = when required by **minimality**

Correct Predictions: Reduplication

Phase-based spellout account of root shape change → correct predictions about reduplication and the intransitive suffix

Reduplicated roots → no shape change with LH-triggering suffixes

Reduplicated roots have more than one vowel → no epenthesis

- Base-Reduplicant faithfulness in fact prevents epenthesis
- /RED-**tʃiʃ**-/ → [**tʃiʃ.tʃiʃ**-], *[tʃi.ʃa:.tʃiʃ-], *[tʃiʃ.tʃi.ʃa:-]

Expected if root shape change driven by **minimality**, but not if resulting from suffix template imposition or subcategorization

Correct Predictions: Unaccusative v

Also correctly predicts → any non-phase-head suffix merged below vP-phase head gets spelled out with the root

Unaccusative suffix /-n-/ becomes part of the shape-changed root:

- /**t'ul-n**-ʔa-n'/ burn-UNACC-DUR-FUT → [(**t'o.lon**).ʔan'] 'is burning'
- Asp* suffix /-ʔa-/ sends its complement (= root plus unaccusative v) to be spelled out first → LH iamb
- Identical to “fake base” phenomenon in Newman (1944)

Not expected if trigger suffixes impose templates on adjacent roots

Future Directions

Other predictions need to be checked:

Shape change due to minimality, not template imposition → multiple vP-phase head suffixes should only trigger one LH iamb

Specific structure of syntactic tree and relative height of suffixes should reveal semantic or scopal differences

- E.g., I posit LH-triggering suffix /-ʔa-/ and non-triggering suffix /-xo-/ to be Situation Aspect and Viewpoint Aspect heads, respectively
- Should be semantically distinguishable, but currently seem very similar
- Distribution possibly due to presence of suffixes in lower head

Future Directions

Integrating account into bigger picture of Chukchansi **phrasal syntax** and **derivational phonology**

- Phrasal syntax is relatively free, but phase effects may be deducible
- Other aspects of phonology refer to similar morphological structure:
 - Long high vowel lowering (Guekguezian 2012)
 - Repairs of unsyllabifiable consonants (Hansson 2005)

Thorough comparison with other Yokuts languages

- Initial look at Newman (1944) → same generalizations hold, but more data needed

Conclusions

Principled analysis of **root shape change** in Chukchansi Yokuts

- **Not arbitrarily** selected by the morphology
- Result of **syntactic** structure of words (e.g., Halle and Marantz 1993) and general **prosodic** constraints (e.g., Prince 1991, Kager 1993)

Phase-based spellout inside the word (e.g., Marantz 2001, Martin 2002, Newell 2008) → one vowel roots surface with LH iamb as **minimality effect** triggered by vP-phase head suffix

- **Prosodic Templates** = Phase-Based Spellout + Minimality

Conclusions

Chukchansi Yokuts: example of word-internal **syntactic boundary** perfectly corresponding to **phonological boundary**

This and other work (e.g., Travis 2010) suggest certain syntactic and phonological boundaries coincide in general

Tentative suggestion: languages with morphologically complex verbs show homology between **vP phase** in (morpho-)syntax and **templatic verb stem** in (morpho-)phonology

Intriguing correlations between vP phase and templatic verb stem in varied language families (Muskogean, Bantu, Semitic)

Crucial Thanks

My colleagues at CSU Fresno, especially Chris Golston, Brian Agbayani, and Niken Adisasmito-Smith

Karen Jesney and Roumi Pancheva for detailed feedback

The audiences at USC Phon Lunch and Syntax+

The USC Graduate School for funding through a Research Enhancement Fellowship

Most of all, my Chukchansi consultants, Holly and Jane Wyatt