Vowel Raising and Positional Privilege in Klamath
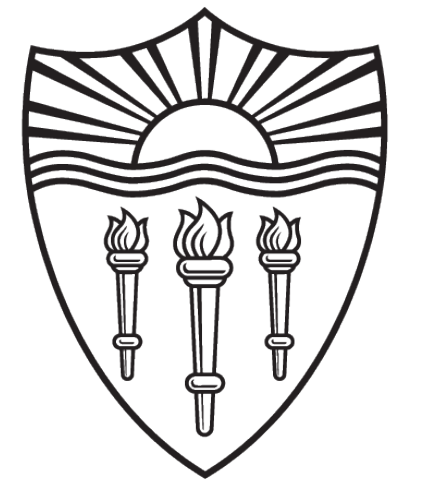
Charlie O'Hara
University of Southern California
charleso@usc.edu

1. Overview

In previous work on Klamath (Barker, 1963, 1964), several opaque alternations are explained using abstract phonemes, such as /i/, in the underlying representations (UR).

50 verb stems have /i/ in their final syllable. (Barker 1963)

/i/ alternates between [i] and deletion.

/ʔe:wi-a/→[ʔe:w̥_a]   /ʔe:wi-tkʰ/→[ʔe:w̥itkʰ]

Why doesn't /i/ appear in non-final syllables? Or nouns?

CLAIM: The [i]~[∅] alternation is best analyzed as underlyingly /e/.
/e/ deletes or raises in unprivileged positions.

This alternation between [i] and [∅] only appears in non-stem-initial syllables of verbs, at the morpheme boundary.

This alternation is often accompanied with glottalization of the last consonant when combined with /-a/

[ntʰe:w̥_'-a]~[ntʰe:wi-tkʰ]

No surface exponent can serve as a UR.

- [a] is the default epenthetic vowel in Klamath, not underlyingly /∅/

/taq'-a/→[taq'a]
/taq'_-tkʰ/→[taq'atkʰ]
/taq'-n'i/→[taqn'i]

/ntʰe:w'-a/→[ntʰe:w'a]
/ntʰe:w'_-tkʰ/→*[ntʰe:w'atkʰ]

- /i/-final verb stems cause deletion of /a/, not underlyingly /i/

/stupw̥i-a/→[stupw̥i_]
/stupw̥i-tkʰ/→[stupw̥itkʰ]

/ntʰe:wi-a/→*[ntʰe:wi_]
/ntʰe:wi-tkʰ/→[ntʰe:witkʰ]

2. Distribution of e

- Barker never posits underlying /e/ in noninitial syllables of verbs.
- [e] (almost) never surfaces in verb non-stem-initial syllables
- [e] and the [i]~[∅] alternation are in complementary distribution.

Nouns/Stem Initial Syllables
i   u
e
a

Non-initial syllables in Verbs
i   u
a

3. Positional Privilege

In unprivileged positions, vowel contrasts can be lost.

- Nouns are privileged over verbs (Smith 1998, 2011)
- Stem-initial syllables are privileged over non-stem initial vowels (Steriade 1995, Walker 2011, Trubetzkoy 1969, Beckman 1998)
- Long vowels are privileged over short vowels. (Steriade 1995, Beckman 1998)

[e] is more marked than the other vowels in Klamath

- /e/ is protected in nouns

/sqʰule/_NOUN→[sqʰule]

- /e/ is protected in stem-initial syllables

/teju:w-a/→[teju:wa]

If short /e/ is in a non-stem-initial syllable in a verb, it must be repaired.

- Since [w̥itkʰ] never surfaces, /e/ cannot delete, so must raise to [i].

/ʔe:w̥e-a/→[ʔe:w̥_a]
/ʔe:w̥e-tkʰ/→[ʔe:w̥itkʰ]

- If /e/ is followed by a glottal stop, the glottal stop coalesces with the preceding consonant if e deletes

/ntʰe:weʔ-a/→[ntʰe:w_'a]
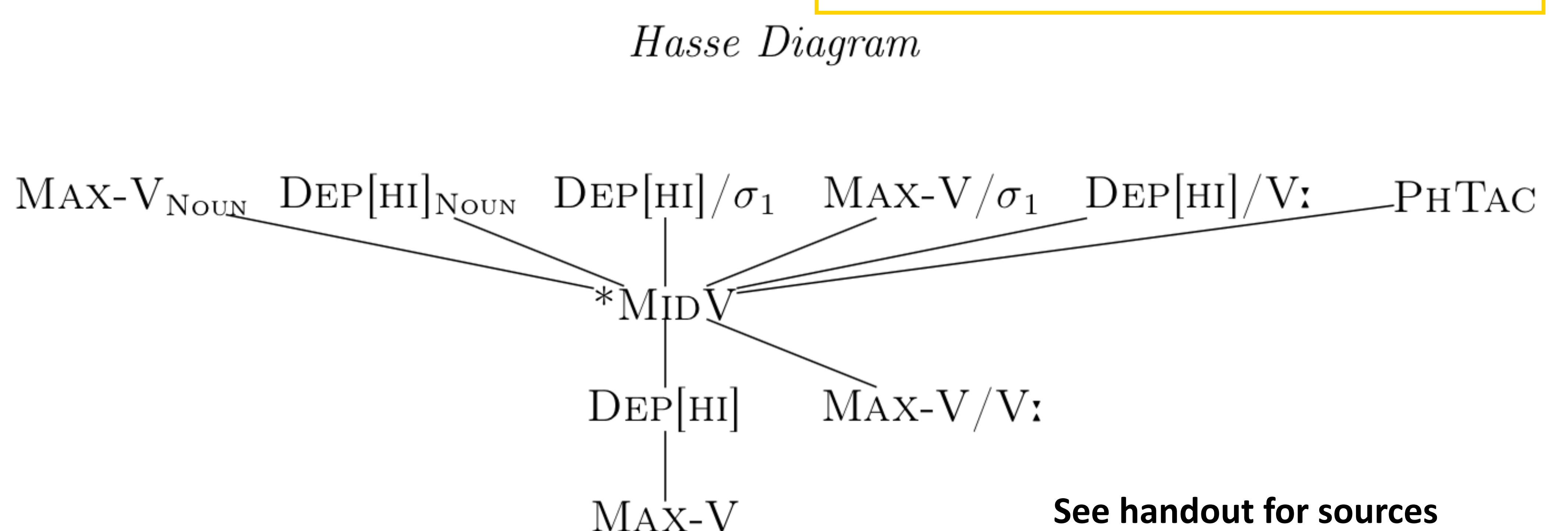
- It deletes if it would not be prevocalic. (O'Hara 2013)

/ntʰe:weʔ-tkʰ/→[ntʰe:witkʰ]

- /e:/ appears faithfully usually, but in the positions where [i]~[∅] are found, it alternates between [e:] and [∅].

/nt'use:ʔ-tkʰ/→[nt'use:tkʰ]
/nt'use:ʔ-a/→[nt'us_ʔa]

These phenomena can be modeled in OT using positional faithfulness constraints (Beckman 1998), with the following ranking.

/e/ Deletes in unprivileged positions

/ʧ'u:jeʔ-a/	PHTAC	*MIDV	DEP[HI]	MAX-V
☞ a. ʧ'u:j'a				*_e
b. ʧ'u:jeʔa		*_eW		L
c. ʧ'u:jiʔa			*_iW	L

/e/ Raises in unprivileged positions to avoid illicit clusters

/ʧ'u:jeʔ-tkʰ/	PHTAC	*MIDV	DEP[HI]	MAX-V
☞ a. ʧ'u:jitkʰ			*_i	
b. ʧ'u:jtkʰ	*_jtkʰ W		L	*_eW
c. ʧ'u:jetkʰ		*_eW	L	

Long /e:/ is not totally protected in unprivileged positions

/nt'use:ʔ-tkʰ/	PHTAC	DEP[HI]/V:	*MIDV	MAX-V/V:
☞ a. nt'use:tkʰ			*_e:	
b. nt'usi:tkʰ		*_i: W	L	
c. nt'ustk	*_stkW		L	*_e:W

/nt'use:ʔ-a/	PHTAC	DEP[HI]/V:	*MIDV	MAX-V/V:
☞ d. nt'us?a			*_e:	
e. nt'usi:ʔa		*_i: W	L	
f. nt'use:ʔa			*_e:W	L

4. Conclusion

This analysis allows these class of 50 verb stems to all show this same alternation.

This is evidence that noun faithfulness effects extend to the segmental level, c.f. Smith (2011)

It also explains the gaps in the distribution of /e/.

- /e/ in other unprivileged positions absolutely neutralizes with /i/ or /∅/.

No other abstract UR (/i/, /ɪ/, etc.) explains both the distribution of /e/ and of this alternation.

A positional privilege approach is necessary to explain the distribution of [e], and can also explain the less opaque [e:]~[∅] alternations.

By positing this slightly abstract UR, a learner can explain a large amount of data without increasing the abstractness of the grammar.

- Doesn't add underlying phonemes
- Doesn't require cophonologies
- Makes otherwise accidental gaps systematic.
- Doesn't require otherwise unnecessary constraints

A phonological learner that allows some abstractness in URs and minimizes grammar complexity should be able to learn this data.

Hasse Diagram

MAX-V$_{Noun}$ DEP[HI]$_{Noun}$ DEP[HI]/σ_1 MAX-V/σ_1 DEP[HI]/V: PHTAC

*MIDV

DEP[HI]   MAX-V/V:

MAX-V

See handout for sources