Class 18: Stress III—more feet

To do
- Finish Manam.

1. Overview

Last time we discussed some possible arguments for feet, such as word minimality. But we also discussed counter-arguments.
This time we'll look at a famous asymmetry in the *inventory* of feet.

2. Hayes (1995) argues that the inventory of feet is asymmetric

	trochees	*iambs*
quantity-insensitive	**attested**	unattested
quantity-sensitive	**attested: moraic**	**attested: "uneven"**

3. Quantity-insensitive ("syllabic") trochees

Let L = a light syllable (1 mora, like CV)
Let H = a heavy syllable (2 moras, like CVV or CVC)
Let boldface (**L**, **H**) indicate stress

Any two syllables can form a trochee—moras don't matter.
(**L**L), (**L**H), (**H**L), (**H**H) vs. *(**L**), *(**H**), except maybe for leftover syllables

Pintupi (Australian language; data originally from Hansen & Hansen 1969)

(pá.ɲa)	'earth'
(tʲú.ʈa)ya	'many'
(má.ɭa)(wà.na)	'through from behind'
(pú.ɭiŋ)(kà.la.)tʲu	'we (sat) on the hill'
(tʲá.mu)(lìm.pa)(tʲùŋ.ku)	'our relation'
(kú.ra)(nʲú.lu)(lìm.pa)(tʲù..ɻa)	'the first one (who is) our relation'
(yú.ma)(ɻìŋ.ka)(mà.ra)(tʲù..ɻa)ka	'because of mother-in-law'

But what if coda consonants just aren't moraic in this language, so that all the syllables are light? More convincing is an example from a language with contrastive vowel length:

Votic, aka Vod (Uralic language from Russia, probably extinct; Ariste 1968[1])
IPA stress marks used below; otherwise, Ariste's transcription. Macron (ī) indicates vowel length.

(ˈka.na)	'hen'
(ˈtüt.tö)	'girl'
(ˈsā.mā)	'to get, obtain'
(ˈā.pa)	'aspen tree'

[1] Ariste, Paul (1968). *A grammar of the Votic language*. Bloomington: Indiana University and The Hague: Mouton.

(ˈko.tō)	‘home (ill.)’
(ˈpa.ла).(ˌva)	‘hot’
(ˈli.säu).(ˌgō)	‘let it increase’
(ˈvē.ret).(ˌtēB)	‘it rolls’
(ˈso.pi).(ˌzim.ma)	‘we got along’
(ˈbö.ri).(ˌze.mā̄)	‘to roar, rumble’

4. Quantity-sensitive (“moraic”) trochees

A foot is composed of two moras, whether they come from one syllable or two.
But a foot can’t begin or end in the middle of a syllable.

(**L**L), (**H**) vs. *(**L**H), *(**H**H), *(**H**L), *(**L**) [(**L**) might be OK for a leftover syllable, depending on the language]

We saw these in Cairene. Here’s another example (if we have time):

Cahuilla (Uto-Aztecan language from Southern California; data taken from Hayes, but originally from Seiler[2])

In this language, a syllable with a long vowel, diphthong, or coda [ʔ] counts as heavy.

- Draw in the foot boundaries for the simple cases—what’s the parameter setting for leftover syllables (foot them or don’t foot them)?

tá.ka.lì.čem	‘one-eyed ones’
táx.mu.ʔàt	‘song’
háʔ.tìs.qal	‘he is sneezing’
mú:t	‘owl’
páʔ.lì	‘the water (objective case)’
qá:n.kì.čem	‘palo verde (pl.)’
táx.mu.ʔàʔ.tì	‘the song (objective case)’

- What happens when a heavy syllable is awkwardly placed?

sú.kàʔ.tì	‘the deer (objective case)’
pú.kàw.tè.mih	‘gopher snakes (obj. pl.)’
kíh.mày.ʎù.qal	‘wonder why’
pá.làw.wè.net	‘that which is beautiful, pretty’
hé.ʔi ká.kàw.là:.qà	‘his legs are bow-shaped’

[2] Data sanitized a bit: optional de-stressing suppressed even in forms where only one transcription is given. See Hayes for discussion of final degenerate feet—they are probably de-stressed by a late rule.

- Lexical phonology review: what could we do about these prefixed forms ("#" indicates prefix-stem boundary)?

pà.pen#tú.le.qà.le.vèh	'where I was grinding it'
ne#yú꞉l	'my younger brother'
nè.sun#ká.vì꞉.čì.wen	'I was surprised'
tax#kí.ʌ̂w.kà.tem	'companions'
pen#pé.nì꞉.čì.ni.qà	'translate'

5. Quantity-sensitive ("uneven") iambs

Here, a heavy syllable can form a foot only on its own or with a preceding L. That is, H can't be the weak member of a foot.

(L**L**), (L**H**), (**H**) vs. *(H**L**), *(H**H**), *(**L**) [(**L**) might be OK for a leftover syllable]

Muskogee (a.k.a. Seminole/Creek)—taken from Hayes again, but data originally from Haas (1977), Tynhurst (1987), and Martin.

- Use iambic feet to explain why stress is sometimes final, sometimes penultimate:

co.kó	'house'
ni.háa	'lard'
hok.tíi	'woman'
íc.ki	'mother'
o.sá.na	'otter'
ko.fóc.ka	'mint'
ak.cáwh.ka	'stork'
hi.to.tíi	'snow'
ak.ha.síi	'lake'
ha.liis.síi	'moon'
tii.niit.kíi	'thunder'
taas.ki.tá	'to jump (sg. subj.)'
a.pa.ta.ká	'pancake'
taas.ho.kí.ta	'to jump (dual subj.)'
a.no.ki.cí.ta	'to love'
to.koɬ.ho.kí.ta	'to run (dual subj.)'
a.ti.loo.yi.tá	'to gather'
iŋ.ko.sa.pi.tá	'one to implore'
i.si.ma.hi.ci.tá	'one to sight at one'
naf.ki.ti.kaa.yi.tá	'to hit (pl. obj.)'

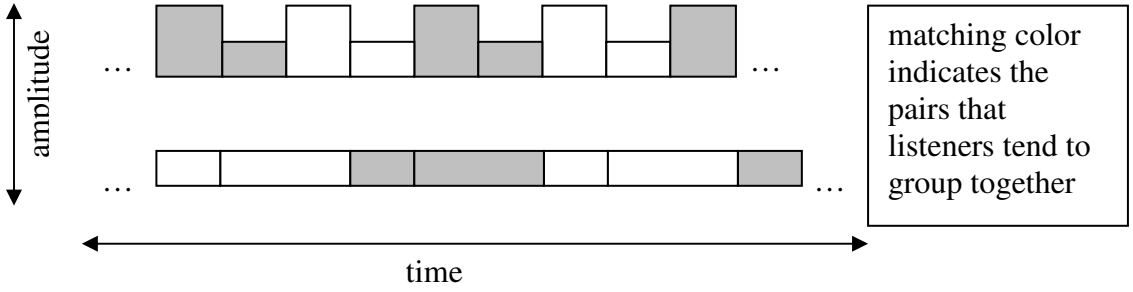
6. An asymmetric inventory

Hayes (1995) argues, through an extensive typological survey, that these 3 are the only foot types. There are claimed to be no languages with syllabic iambs, or with "uneven trochees"—i.e., (**H**), (**H**L), (**L**L) but not *(**H**H), *(**L**H).

(No moraic iambs either, but these are harder to argue about, because they would be different from uneven iambs only in allowing (L**H**), which is hard to distinguish empirically from L(**H**).)

7. Why?

Moras correspond roughly to duration: H syllables last longer than L syllables.
Hayes cites psychological research on how people group rhythmic sequences of sounds.



Grouping preference is stronger for duration-varying stimuli than for amplitude-varying stimuli.

Hayes cites also:

- similar evidence from musicians' judgments (Cooper & Meyer)
- a study of Swedish poetry (Fant, Kruckenberg & Nord) in which…
  - reciters produced greater durational contrasts in iambic verse than in trochaic
  - musicians transcribing verse into musical notation were more likely to transcribe different durations for accented and unaccented syllables in iambic verse than in trochaic
  - poets use greater contrast in number of phonemes (for accented vs. unaccented syllables) in iambic verse than in trochaic

  (see also Newton 1975 for English verse)

➔ "Iambic/Trochaic Law
a. Elements contrasting in intensity naturally form groupings with initial prominence.
b. Elements contrasting in duration naturally form groupings with final prominence." (p. 80)

8. Problems for a grammar

- What can an iambic language do when confronted with a HH sequence? HL?
- What can a language with moraic trochees do when confronted with a HH sequence? HL?

9. Iambic lengthening

Hixkaryana, Carib language with 550 speakers in Brazil. Data originally from Derbyshire (1985).

- Vowel length is not contrastive; all these long vowels are derived by rule. What is it?

kʷáː.<ja>	'red and green macaw'
ne.mòː.ko.tóː.<no>	'it fell'
a.tʃóː.wo.<wo>	'wind'
to.róː.<no>	'small bird'
àk.ma.táː.<rɨ>	'branch'
òw.to.hóː.<na>	'to the village'
tòh.ku.rʲéː.ho.<na>	'to Tohkurye'
tòh.ku.rʲèː.ho.nàː.ha.ʃáː.<ka>	'finally to Tohkurye'
nàk.ɲòh.jàtʃ.ke.náː.<no>	'they were burning it'
mɨ.hàː.na.nɨ́h.<no>	'you taught him'
kʰa.nàː.nɨ́h.<no>	'I taught you'

Asymmetry: Trochaic lengthening is much rarer.
But, in moraic-trochee languages there is sometimes *shortening* of the strong syllable! Hayes proposes that this is to allow more syllables to get included in feet: e.g., /LLLH/ → [(**L**L)(**L**L)] instead of [(**L**L)L(**H**)].

10. Trochaic shortening example

In Fijian, vowel length is contrastive, but its distribution is limited. (Based on data from Schütz and analysis by Hayes.) Mostly loan words are shown below because, as in English, they're the best source of long, monomorphemic words.
[Fijian: Austronesian language from Fiji with 334,000 speakers]

- What are the footing rules of Fijian?

láko	'go'
tálo	'pour'
βináka	'good'
atómi	'atom'
ⁿdìkonési	'deaconess'
prèsitéⁿdi	'president'
ᵐbàsikètepólo	'basketball'
seŋ́áj	'no'
ᵐbasáː	'bazaar'
ⁿdòketáː	'doctor'
palàsitáː	'plaster'
mìnisìtiríː	'ministry'
terènisìsitáː	'transistor'
ⁿdàjrèkitáː	'director'

^{n}rè:^{n}ré:	‘difficult’
^{m}bè:léti	‘belt’
taràwsése	‘trousers’
^{m}bèle^{m}bò:tómu	‘bellbottoms’
mì:sìni^{ŋ}gáni	‘machine gun’

- Account for shortening in Standard Fijian:

^{m}bú:	‘grandmother’	^{m}bú-^{ŋ}gu	‘my grandmother’
tá:	‘chop’	tá-ja	‘chop-transitive-3 sg. obj.’
^{n}ré:	‘pull’	^{n}ré-ta	‘pull-trans.’
ðaðá:	‘lots of bad things’	ðaðá-^{ŋ}gu	‘my bad things’[3]
sì:βí-ta	‘exceed-trans.’	síβi	‘exceed’
ráj	‘see’	ră̋j-ða	‘see it’

The curved diacritic over the vowel in ‘see it’ indicates that the vowel is short (it is also stressed). Assume that the resulting rime [ăj] has only one mora.

- Here’s another dialect to account for (examples partly fabricated but the dialect is real):

sì:βí-ta	‘exceed-trans.’	síβi	‘exceed’
ráj	‘see’	ré-ða	‘see it’
láw	‘wug’	ló-ða	‘wug it’

- And another dialect:

sì:βí-ta	‘exceed-trans.’	síβi	‘exceed’
ráj	‘see’	ra.í.-ða	‘see it’
láw	‘wug’	la.ú.-ða	‘wug it’

- One last dialect:

ráj	‘see’	rá-ða	‘see it’
láw	‘wug’	lá-ða	‘wug it’

[3] Made-up form.