

Class 17: Stress II—more grid, and feet

To do

- Manam assignment due in a week

1. What are feet?

The foot is a concept from poetic metrics. There, a foot is a grouping of stressed (or “long”, a term used more properly for Latin verse than for English) and unstressed syllables. [I’m collapsing the first two layers of the grid, using . for unstressed and *x* for stressed.]

Trochee trips from long to short;	(x .)
From long to long in solemn sort.	“ “
Slow Spondee stalks, strong foot!, yet ill-able	(x x)
Ever to keep up with Dactyl's trisyllable.	(x . .)
Iambics march from short to long.	(. x)
With a leap and a bound the swift Anapests throng.	(. . x)
One syllable long, with one short at each side,	(. x .)
Amphibrachys hastes with a stately stride; --	“ “
First and last being long, middle short, Amphimacer	(x . x)
Strikes his thundering hoofs like a proud high-bred Racer.	“ “ (Coleridge)

Linguistic feet seem to be trochees and iambs only. A language usually (but not always!) has all trochees or all iambs. English is said to have trochaic phonological feet (regardless of poetic meter):

	x	<i>or, equivalently,</i>	x	
x	x		x	x
x	x	x	(x .)	(x .)
(x x)	(x x)	(x x)	A pa	la chi co la
A pa	la chi	co la		

- Which parameter from last time would be replaced by an iambic/trochaic parameter?

For those who have studied metrics, note that metrical feet—[] below—are not the same as phonological feet—marked approximately with ():

[(Tró)(chèe)] [(tríps) from] [(lóng) to] (shórt);
 From [(lóng) to] [(lóng) in] [(sólemn)] (sórt).
 [(Slów) (Spón)] [(dèe) (stálks)], [(stróng) (fóot)!], [(yèt) (ìll)] -(áble)
 [(éver) to] [(kéep) (ùp) with] [(Dáctyl)'s (trì)] [(sýlla)ble.]
 [I(ám) [bics) (márch)] [from (shórt)] [to (lóng).]
 [With a (léap)] [and a (bóund)] [the (swift) (Á) [na](pèsts) (thréng)].
 [(Òne) (sýlla)] [ble (lóng), with] [(òne) (shórt) at] (èach) (síde),
 [(Àm)(phíbra)] [chys (hástes) with] [a (státely)] (stríde);

[(Fírst) and (lást)] [(béing) (lóng),] [(míddle) (shórt),] [(Ámphi)(mà]cer)
 [(Stríkes) his (thún) [der]ing (hóofs)] [(like) a (próud)] [(hígh)-(brèd) (Rá]cer).

Crucially, feet group syllables, not segments or moras directly:

foot
/ \
σ σ

2. Cairene Arabic revisited

- How are these data problematic for the analysis we had of Cairene stress last time?

<i>o</i>	ka.táb.ta	‘you (m.sg.) wrote’	
<i>p</i>	mu.dár.ris	‘teacher’	(not Classical)
<i>q</i>	mu.dar.rí.sit	‘teacher (f. construct)’	(not Classical)

- If we use feet, can we solve the problem? What assumptions do we need to make about feet in Cairene?

3. Some OT constraints for stress

Some from Prince & Smolensky 1993, some from McCarthy & Prince 1995,¹ others in general use but whose origin I didn’t track down.

- TROCHAIC/IAMBIC: the first/last element of each foot is more prominent than any other element of that foot.
- WEIGHTTOSTRESSPRINCIPLE: a heavy syllable must be stressed (based on pre-OT work by Prince)
- FOOTBINARITY-moraic/syllabic: a foot must consist of exactly two moras/syllables
- FOOTBINARITY-general: a foot must consist of exactly two moras or exactly two syllables (or both)
- NONFINALITY-stress/footing: the last syllable of a word must not be stressed/footed
- PARSE-σ: every syllable must be in a foot
- EDGEMOST-L/R: the first/last syllable of the word is footed
- LEFTMOST/RIGHTMOST: The first/last foot contains the primary stress of the word
- NOCLASH/NOLAPSE: don’t have two stressed/unstressed syllables in a row (could also define on grid)
- ALLFEETL/R: every foot should be at the beginning/end of the phonological word—I will leave it for 201 to define this more precisely!! (requires Generalized Alignment)
- CULMINATIVITY: every content word has exactly one main stress (sometimes treated as the combined effect of a constraint requiring a content word to project a phonological-word boundary and another requiring every phonological word to contain at least one foot).

To some extent this constraint set may be redundant: if we have feet, do we need constraints against clash and lapse? (In some cases, answer is yes.) If we have constraints against clash and lapse, do we need feet? See arguments below...

¹ McCarthy, John & Alan Prince. 1995. Generalized Alignment. In Geert Booij and Jaap van Marle, eds, *Yearbook of Morphology 1993*, 79-153. Kluwer: Boston.

4. OT analysis of Classical Cairene (assume secondary stresses are deleted post-lexically)

We need a stipulative constraint (to have an analysis faithful to Hayes's):

FINALSYLLABLECOUNTS: a mora can't be extrametrical if it's the only one in its syllable

>> FINALMORAEXTRAMETRICAL: the word-final mora is extrametrical

=> Final mora is extrametrical unless it's the only one in its syllable. Below are shown only candidates that survive these two constraints

šajaratuhu	
☞ <i>a</i>	(šà.ja)(rá.tu)hu
<i>b</i>	(šá.ja)(rà.tu)hu
<i>c</i>	(šà.ja)ra(tú.hu)
<i>d</i>	ša(jà.ra)(tú.hu)
<i>e</i>	(šá.ja)ra.tu.hu
<i>f</i>	(šà.ja)(rà.tu)(hú)

ʔadwiyatuhu	
☞ <i>a</i>	(ʔàd)(wì.ya)(tú)hu
<i>b</i>	(ʔàd.wi)(yá.tu)hu

ʔadwiyatuhumaa	
☞ <i>a</i>	(ʔàd)(wì.ya)(tú.hu)ma<a>
<i>b</i>	(ʔàd)(wì.ya)tu.(hú.ma)<a>
<i>c</i>	(ʔàd)(wì.ya)(tù.hu)(má)<a>

5. Example from Kager reading: Bedouin Hijazi Arabic

(dialect of Hijazi Arabic, an Afro-Asiatic language with 6,000,000 speakers in Saudi Arabia—data originally from Al-Mozainy, Bley-Vroman & McCarthy 1985)

Last syllable is extrametrical unless superheavy (CVVC) or unless word has just two syllables, with two-mora trochees built from right to left (only the last one gets stress):

mak.túu.<fah>	'tied (fem. sg.)'	} what else do we have to say?
mak.túub	'written'	
máa.la.<na>	'our property'	
ʔín.ki.<saR>	'he got broken'	

- Stress interacts with deletion. What happens if we order stress before deletion? After?

	sá.Ha (<i>maybe</i>)	'he pulled'
	sa.Háb.<na>	'we pulled'
/saHab+at/	sHá.<bat>	'she pulled'
/ʔinkasaR+at/	ʔink.sá.<Rat>	'she got broken'
	<i>compare to</i> ʔín.ki.<saR>	

- Another way of thinking about it: how does an x “know” where to go after its syllable is deleted?

x
 $x\ x\ x\ x$
 ?in ka sa <Rat>

- Ideas from your study-question answers about how to do this without feet?

6. Example: Winnebago/Hocąk again

(Based on discussion in Kenstowicz 1994)

If we restrict ourselves to light syllables (those with short vowels), we could say that initial syllables are extrametrical and iambs are formed from left to right.

Dorsey's Law: C C V → 1 3 2 3
 [+son]
 1 2 3

/ho+š+waža/	hošawažá	‘be sick’
/hi+kro+ho/	hikorohó	‘prepare, dress (3 sg.)’

- Based on the data above, which should apply first, basic stress or Dorsey’s Law?

In OT, perhaps we could have a constraint against stressing epenthetic vowels (as we’ve seen for Broselow, Kager, discussed in Kiparsky reading).

Let’s assume that if the final syllable is left unfooted by the basic stress rule, it can form a (“degenerate”, because too small) foot (in OT, PARSE- σ >> FTBIN). But, final stress is deleted by a late rule if it clashes with a penultimate stress (in OT, NOCLASH >> PARSE- σ).

- In that case, are these word consistent with what we’ve seen so far?

/ha+ra+ki+š+rujik+šna/ harakíšurujikš~~na~~ ‘pull taut (2d)’

- Here come the interesting cases—analysis?

/ha+ki+rujik+šna/	hakirújikš na	‘pulls taut (3d)’
/hi+ra+kro+ho/	hirakórohò	‘prepare’
/maḡ+š+rač/	maḡ.áš rač	‘you promise’
/hi+ra+kro+ho+nira/	hirakórohò nira	‘prepare, dress (2 d.)’
/wakripras/	wakiripáras	‘flat bug’

This looks very Stratal-OT-ish: we need feed to be formed before Dorsey’s Law, but what happens next looks a lot like constraint satisfaction.

- Last time we had various ideas about how disyllabic words get stress (don't apply extrametricality if disyllabic, start on peak if disyllabic, I can't remember what else). Do the following forms help narrow it down?

/ho+kwe/	hokewé	'enter'
/š+wažok/	šawažók	'mash'

(There is more to this story, and Hayes' analysis is quite different.)

7. Minimality

McCarthy & Prince 1986 (see them for references): It is common for languages to impose a minimum size on content words.

Estonian (recall from our discussion of the duplication problem): at least two moras—word-final C doesn't count

/tänav/	tānav	'street (nom.sg.)'
/konna/	kon:n	'pig (nom. sg.)'
/kana/	kana (*kan)	'chicken (nom. sg.)'

Kahnawake Mohawk: at least two syllables

/k+tats+s/	íktats	'I offer'
/hs+yaʔks+s/	íhsyaʔks	'you are cutting'

- How can we describe all these minimums?

Hayes 1995: Can we also say that "every word must be able to undergo the stress rule"? If so, must that rule refer to feet? Try it for Mohawk, which has penultimate stress.

Consider Pitta-Pitta, whose words also must be at least two syllables:²

káku	'older sister'
kákila	'coolamon, car, buggy'
kálakùra	'type of corroboree'

- What would be the main stress rule for Pitta-Pitta?
- Does your rule exclude subminimal words (*ka)? What about other formulations of the rule?

8. Other arguments for feet

- Latin enclitic stress (see Kager)—but some of you had other ideas, like the clitic comes with an floating grid-mark for the preceding syllable, or the stress rule that applies after cliticization is different from the earlier stress rule, or that *-que* is /kue/ instead of /kwe/, or

² Data warning: To get these examples I took words from Blake's "Pitta Pitta wordlist" (coombs.anu.edu.au/SpecialProj/ASEDA/docs/0275-Pitta-Pitta-vocab.html), which doesn't mark stress, and then added in the stresses according to Hayes' reporting of Blake's (1979) description.

that enclitics are exempt from extrametricality, or that the /k/ is syllabified as a coda just for this morpheme...

- Phenomena in prosodic phonology (reduplication, truncation)—see next quarter, maybe.
- Various consonantal rules that apply to the “strong” or “weak” syllable of a foot, even if the foot is not supposed to have any stress (i.e., in languages with no secondary stress). See González 2003.
- Expletive infixation (see McCarthy 1982 *LI* article)

But see, e.g., the foot-free Gordon, Matthew (2002). A factorial typology of quantity insensitive stress. *Natural Language and Linguistic Theory* 20, 491-552.

9. Exercise if extra time: Italian

- Treat the following words as representing the basic primary-stress pattern of Italian. What are the parameter settings?

<i>a</i>	mé.se	‘month’
<i>b</i>	ká.sa	‘house’
<i>c</i>	fjá.to	‘breath’
<i>d</i>	tér.ra	‘earth’
<i>e</i>	dʒór.no	‘day’
<i>f</i>	di.ví.sa	‘uniform’
<i>g</i>	tri.bú.na	‘rostrum’
<i>h</i>	kom.prá.re	‘buy’
<i>i</i>	kor.ní.tʃe	‘corniche’
<i>j</i>	me.ta.fo.ní.a	‘metaphony’

- Here are some words with a different stress pattern. There is no other systematic difference between these words and the basic words in (a), so something has to be different about their underlying representations. Ideas for what it could be (various options exist)?

<i>k</i>	ká.li.tʃe	‘chalice’
<i>l</i>	mú.si.ka	‘music’
<i>m</i>	ál.be.ro	‘poplar’
<i>n</i>	fís.si.le	‘fissionable’

- Some word shapes, however, never show antepenultimate stress. Does this follow from the analysis so far?

<i>o</i>	spa.gét.ti	‘spaghetti’
<i>p</i>	a.rán.tʃo	‘orange (color)’
<i>q</i>	am.búr.go	‘hamburger’
<i>r</i>	in.tén.to	‘intent’
<i>s</i>	*á.bur.go	
<i>t</i>	*ín.men.to	

- In addition, there are no words with preantepenultimate stress: *é.na.ti.lo Does that follow from the analysis so far?
- There are some words with final stress—they'll need different underlying representations. Options? (Note: final vowels in Italian are never long on the surface: *par.ló:, *pár.lo;; certain other vowels are predictably long, though I haven't marked them.)

<i>u</i>	ko.li.brí	'hummingbird'
<i>v</i>	dʒo.ve.dí	'Thursday'
<i>w</i>	u.ni.ver.si.tá	'university'
<i>x</i>	li.ber.tá	'liberty'
<i>y</i>	dʒo.ven.tú	'youth'
<i>z</i>	ko.sí	'thus'
<i>aa</i>	tʃit.tá	'city'
<i>bb</i>	per.ké	'why'

- There is a famous exception to the stress pattern laid out above, [mán.dor.la] 'almond' (and a small number of other words like it: [pó.lit.tsa] 'policy', [á.ris.ta] 'pork loin'). We would like to account for these few words without opening the door to completely free stress placement. Speculate on how these words' underlying representation might look.