

Syllabic Trochees

Review from last time

Rhythm

NOCLASH No $\acute{\sigma}$ follows $\acute{\sigma}$
NOLAPSE No σ follows σ

Alignment

TROCHEE No σ between $\acute{\sigma}$ and beginning of ω
IAMB No σ between $\acute{\sigma}$ and end of ω
ALLFTLEFT No σ between φ and beginning of ω

Binarity

FtBin Every foot has two syllables.

A new piece of machinery

CULMINATIVITY Every word has one *primary* stress.

this isn't a common phonological property
words can have many vowels, nasals, stops, tones, etc.

níyiyá

ṅábuwàṅga

ṅárapùwàṅga

mílajìrìṅbìra

‘that-loc’

‘father-his-ERG’

‘mother-his-ERG’

‘we’ll see you’

(níyi)ya

(ŋábu)(wàŋga)

(ŋára)(nùwan)ga

(míla)(jìrìjì)(bìra)

‘that-loc’

‘father-his-ERG’

‘mother-his-ERG’

‘we’ll see you’

($\acute{\sigma}$ σ) σ
($\acute{\sigma}$ σ)($\acute{\sigma}$ σ)
($\acute{\sigma}$ σ)($\acute{\sigma}$ σ) σ
($\acute{\sigma}$ σ)($\acute{\sigma}$ σ)($\acute{\sigma}$ σ)

TROCHEE
NOCLASH
ALLFTLEFT
FTBIN
> PARSE- σ

	TROCHE	NOCLASH	AllFtLeft	FtBin	PARSE-σ
☞ (σσ)(σσ)σ					*
(σσ)(σσ)(σ)				*	
(σσ)σ(σσ)			*		
(σ)(σσ)(σσ)		*			
(σσ)σ(σσ)	*				

equally important

less important


	TROCHEE	NOCLASH	AllFtLeft	FtBin	PARSE-σ
☞ (σσ)(σσ)σ					*
(σσ)(σσ)(σ)				*	
(σσ)σ(σσ)			*		
(σ)(σσ)(σσ)		*			
(σσ)σ(σσ)	*				

Some formalism

input	CONSTRAINT	CONSTRAINT	CONSTRAINT	CONSTR	CONSTRAINT
☞ winner					*
loser				*!	
loser			*!		
loser		*!			
loser	*!				

fatal violation

violation

input	CONSTRAINT	CONSTRAINT	CONSTRAINT	CONSTR	CONSTRAINT
 winner					*
loser				*!	
loser			*!		
loser		*!			
loser	*!				

equally important

less important

	AGE 35	US CITIZEN	NOFASCISTS	NOWOMEN
👉 Joe Biden				
Hilary Clinton				*
Donald Trump			*!	
Vladimir Putin		*!	*	
Angela Merkel		*!		*
Jesus Christ		*!		
your mother				
etc.				

West Finnmark Saami (Bye 2001)



tíeh.tiih

'to know'

véah.ke.hih

'to assist'

át.tes.tèas.tiih

'to give a tiny bit'

póar.raa.sèep.mo.sah

'the oldest ones'

ráah:.kaa.sìj:.ta.sèa.meh

'to our loved ones'

meáh:.tse.tàa.luj.ǎà.sa.meh

'to our forest farms'

(tíeh.tiih)

'to know'

(véah.ke)hih

'to assist'

(át.tes)(tèas.tiih)

'to give a tiny bit'

(póar.raa)(sèep.mo)sah

'the oldest ones'

(ráah:kaa)(sìj:ta)(sèa.meh)

'to our loved ones'

(meáh:tse)(tâa.luj)(đà.sa)meh

'to our forest farms'

($\acute{\sigma}$ σ) σ
($\acute{\sigma}$ σ)($\acute{\sigma}$ σ)
($\acute{\sigma}$ σ)($\acute{\sigma}$ σ) σ
($\acute{\sigma}$ σ)($\acute{\sigma}$ σ)($\acute{\sigma}$ σ)
($\acute{\sigma}$ σ)($\acute{\sigma}$ σ)($\acute{\sigma}$ σ) σ

TROCHEE
NOCLASH
ALLFTLEFT
FTBIN
> NOLAPSE

Babies



Most humans sing songs to their children in trochees.
They are part of our ‘shared, common humanity’.
(Burling 1966)

‘The natural metric form of children 's words is trochaic. ’
(Allen & Hawkins 1978)

‘I would argue that children may come into the world
with a preference for trochaic structure.’
(Archibald 2000)

‘Children are biased towards the trochaic foot.’
(Adams & Bat–El 2007)



Optimality Theory assumes

constraints are innate (TROCHEE, FTBIN, etc.)

babies have to learn how they are ranked

ie, which are absolute, which are tendencies

If there's a trochaic bias in babies,

Trochee > Iamb at birth

Ono
(Phinnemore 1985)



déne

lólotnè

mésikène

árimàgeàke

'my eye '

'many '

'you will sit '

'he always goes '

(´σ)
(´σ)(ò)
(´σ)(´σ)
(´σ)(´σ)(ò)
(´σ)(´σ)(´σ)

TROCHEE
NOCLASH
NOLAPSE
> FTBIN

TROCHEE	←	seems to be an innate bias
NOCLASH	←	grounded in perception, OCP
NOLAPSE	←	grounded in perception, OCP
> FTBIN	←	cf. binary branching in syntax

baby just needs to learn that
NOLAPSE > FTBIN

	TROCHEE	NOCLASH	NoLapse	FTBIN
☞ (óσ)(óσ)(ò)				*
(óσ)(óσ)(σ)			*!	
(ò)(óσ)(óσ)		*!		
(σó)σ(óσ)	*!			

baby learns that NOLAPSE > FTBIN
when she hears her mother say

☞ (óσ)(óσ)(ò)

and not

(óσ)(óσ)(σ)

Hungarian
(Hammond 1987)



(ví:z)	‘water’
(kópɔ)	‘hoe’
(kópa:)(vòl)	‘with hoe’
(téri:)(tò:vɛl)	‘with tablecloth’
(fé:lɛ)(mèlɛ)(tèn)	‘on mezzanine’
(fé:lɛ)(mèlɛ)(tèid)	‘your mezzanines’
(kířku:n)(fè:lɛɟ)(hà:za:)(bòn)	‘in Kiskunfelegyaiza’
(mégvɛs)(tègɛt)(hètɛt)(lènɛk)	‘unbriable (ones)’
(mégvɛs)(tègɛt)(hètɛt)(lènɛk)(nèk)	‘to those unbriable’
(élka:)(pòsta:)(řì:tot)(tòlɔ)(nì:tott)	‘decabbagised’
(légmɛg)(vèstɛ)(gèthɛ)(tètɛ)(nèbbɛk)(knèk)	‘to those least briable’
(élka:)(pòsta:)(řì:tot)(tòlɔ)(nì:tot)(tà:tok)	‘you have decabbagised it’

(´)
(´σ)
(´σ)(`)
(´σ)(`σ)
(´σ)(´σ)(`)
(´σ)(`σ)(`σ)
(´σ)(´σ)(´σ)(`)
(´σ)(`σ)(`σ)(`σ)
(´σ)(´σ)(´σ)(´σ)(`)
(´σ)(`σ)(`σ)(`σ)(`σ)
(´σ)(´σ)(´σ)(´σ)(´σ)(`)
(´σ)(`σ)(`σ)(`σ)(`σ)(`σ)

TROCHEE
NOCLASH
NOLAPSE

(ó) ←
(ós)
(ós)(ò)
(ós)(òσ)
(ós)(ós)(ò)
(ós)(òσ)(òσ)
(ós)(ós)(ós)(ò)
(ós)(òσ)(òσ)(òσ)
(ós)(ós)(ós)(ós)(ò)
(ós)(òσ)(òσ)(òσ)(òσ)
(ós)(ós)(ós)(ós)(ós)(ò)
(ós)(òσ)(òσ)(òσ)(òσ)(òσ)

one syllable words
require one syllable feet

but one syllable feet
are needed word-finally
anyway

(ó) ← CULMINATIVITY > FTBIN

(óσ)

(óσ)(ò) ← NO LAPSE > FTBIN

(óσ)(òσ)

(óσ)(óσ)(ò) ← NO LAPSE > FTBIN

(óσ)(òσ)(òσ)

(óσ)(óσ)(óσ)(ò) ← NO LAPSE > FTBIN

(óσ)(òσ)(òσ)(òσ)

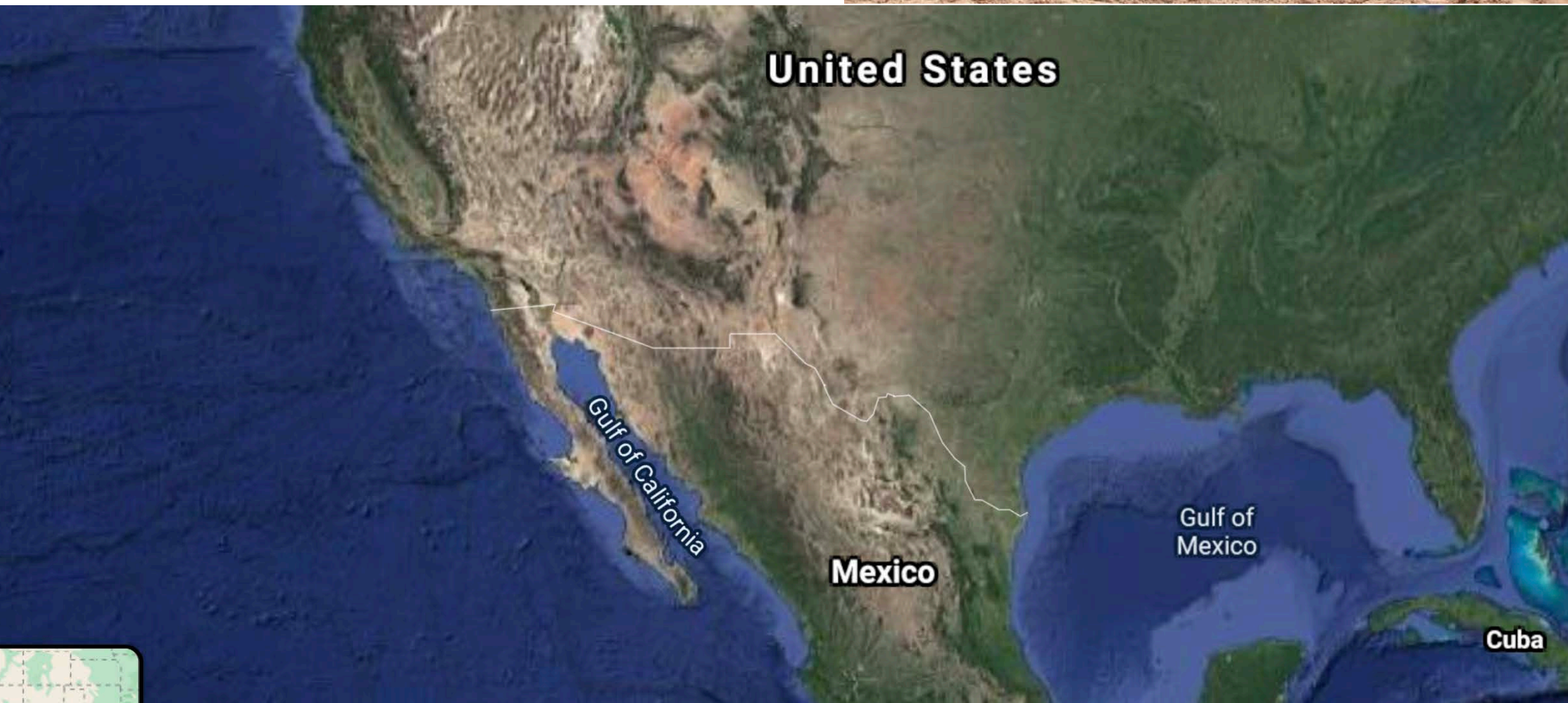
(óσ)(óσ)(óσ)(óσ)(ò) ← NO LAPSE > FTBIN

(óσ)(òσ)(òσ)(òσ)(òσ)

(óσ)(óσ)(óσ)(óσ)(óσ)(ò) ← NO LAPSE > FTBIN

(óσ)(òσ)(òσ)(òσ)(òσ)(òσ)

Tohono O'odham
(Yu 2000)



kí:	‘house’
tó:n	‘knee’
pí:ba	‘pipe’
háiwaj	‘cow’
ʔásugal	‘sugar’
símindzul	‘cemetery’
pákoʔòla	‘Pascola dancer’
(pímiàndo	‘pepper’

(kí:)	‘house’	
(tó:n)	‘knee’	
(pí:ba)	‘pipe’	TROCHEE
(háiwəŋ)	‘cow’	ALLFTL
(ʔásu)gal	‘sugar’	FTBIN
(símin)ɖzul	‘cemetery’	> PARSE-σ
(páko)(ʔòla)	‘Pascola dancer’	
(pími)(àndo)	‘pepper’	

We can add NOCLASH and NOLAPSE to the constraints that are never violated in this language.

The kid on the sheep didn't need to learn anything here.

NOCLASH

NOLAPSE

TROCHEE

ALLFTL

FTBIN

> PARSE- σ

he *did* need to learn this

Golston's Axiom:
learning makes babies cry.



Estonian
(Viitso 2007)



(súu)

(mína)

(sáda)mad

(lýkka)(zìme)

(kóǵe)(lèzi)me

($\acute{\sigma}$)
($\acute{\sigma}\sigma$)
($\acute{\sigma}\sigma$) σ
($\acute{\sigma}\sigma$)($\grave{\sigma}\sigma$)
($\acute{\sigma}\sigma$)($\acute{\sigma}\sigma$) σ

TROCHEE
ALLFTL
FTBIN
> PARSE- σ

AGAIN, can add NOCLASH and NOLAPSE to the constraints that are never violated in this language.

NOCLASH

NOLAPSE

TROCHEE

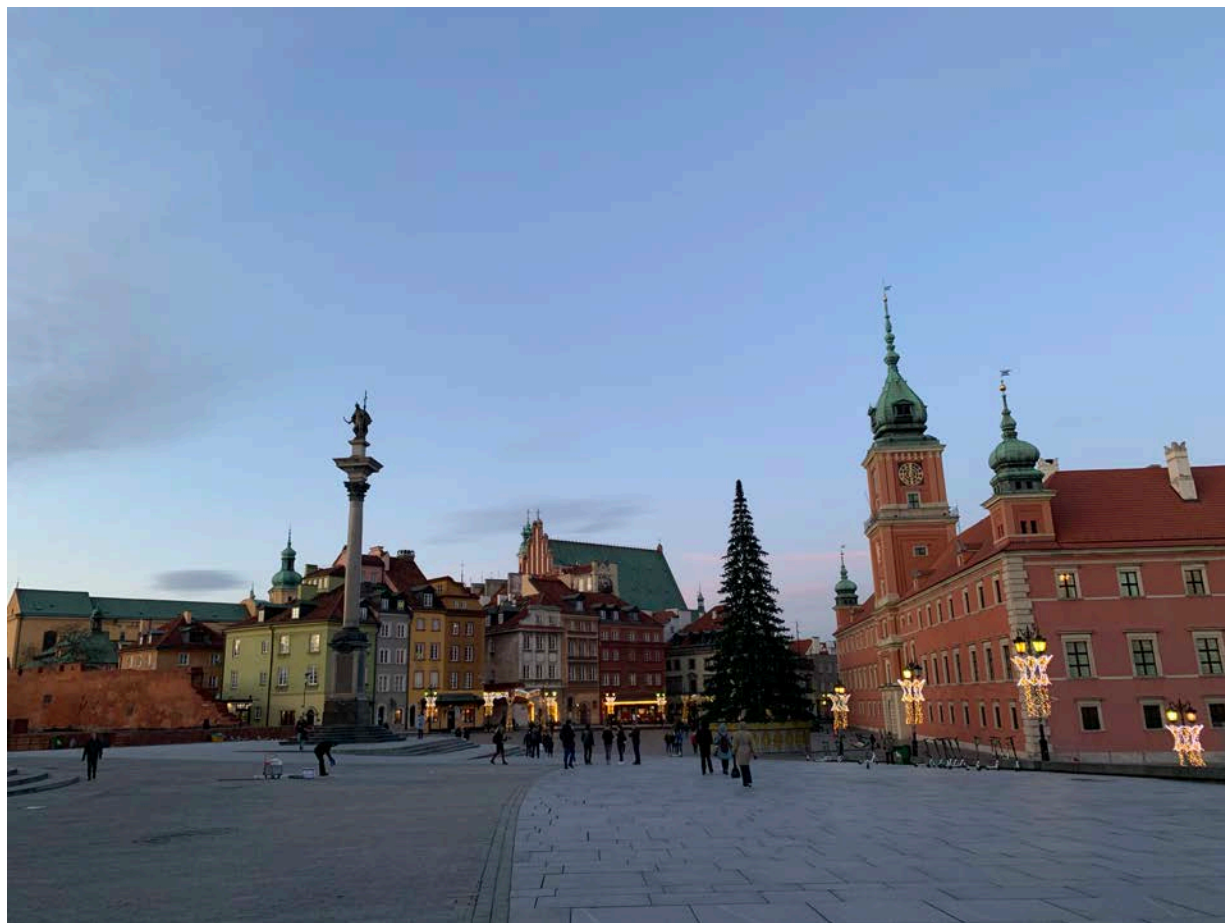
ALLFTL

FTBIN

> PARSE- σ

Estonian babies
learn this

Polish
(Rubach & Booij 1985)



('rozpraw)
war('szawa)
(,hipo)('potam)
(,hipo)po('tamus)
(,revo)(,lucjo)('nista)
(,revo)(,lucjo)ni('stami)
(,konstan)(,tyno)(,poli)('tanczyk)
(,konstan)(,tyno)(,poli)tan('czyka)
(,konstan)(,tyno)(,poli)(,tanczy)('kami)

‘discussion (GEN PL)’
‘Warsaw’
‘hippopotamus’
‘hippopotamus (GEN)’
‘revolutionary’
‘revolutionaries (INSTR PL)’
‘resident of Constantinople’
‘res. of Const. (GEN)’
‘res. of Const. (INSTR PL)’

(óσ)

σ(óσ)

(óσ)(òσ)

(óσ)σ(óσ)

(óσ)(òσ)(òσ)

(óσ)(óσ)σ(óσ)

(óσ)(òσ)(òσ)(òσ)

(óσ)(óσ)(óσ)σ(óσ)

(óσ)(òσ)(òσ)(òσ)(óσ)

FINALFOOT: every word ends in a φ

(´σ)
σ(´σ)
(´σ)(`σ)
(´σ)σ(´σ)
(´σ)(`σ)(`σ)
(´σ)(´σ)σ(´σ)
(´σ)(`σ)(`σ)(`σ)
(´σ)(´σ)(´σ)σ(´σ)
(´σ)(`σ)(`σ)(`σ)(`σ)

NOCLASH
TROCHEE
FTBIN
FINALFOOT
 > ALLFTLEFT
 NOLAPSE

Phrasal Trochees

Piro
(Matteson 1965)



(nsó)
(wálo)
ru(txítxa)
(tšiya)(háta)
(sàlway)eh(kákna)
(pètšì)(tšìma)(tlóna)
(rùslu)(nòti)ni(tkána)
(sàple)(whìma)(mtàna)(tnáka)
(kàxru:)(kàkhi)(màna)ta(tkána)
(rùmka)(hètko)(hìmta)(pànat)(kána)

‘genipa
‘rabbit’
‘he observes taboos’
‘he cries’
‘they visit each other’
‘they say they stalk it!’
‘their voices already changed’
‘they say he went along screaming again’
‘they were joking together then, it is said’
‘it is said that they were perhaps
unfortunately asleep as they were going
along’

a gap shows up before the final foot
if there's an odd number of syllables

(yànta)(mùtško)(nkàkha)(pkàhi)ma(tána)
‘next, it is said, they wrestled’

(kòšpa)(khìtška)(phìma)(tàna)(ktàtka)(lúna
‘then, it is said, someone removed his intestines’

(xèma)(nsìni)(kànkà)(khètko)(hìma)ta(tkána)
‘it is said that maybe they conferred then!’

(tàpa)(lùška)(nàwa)(thìma)(nànu)(mtàna)(tnáka)
‘it is said that his canoe alone was going along again’

a gap shows up before the final foot
if there's an odd number of syllables

ALLFTL applies to the *clause*, not the *word*
FINALFT Every *clause* ends in a foot.

(xèma)(nsìni)(kànkà)(khètko)(hìma)tat(kána)

‘it is said that maybe
they conferred then!

Someone asked yesterday about ternary feet

(óσσ) dactyl

(σόςσ) amphibrach

(σσό) anapest

Garawa (Garrwa)
(Furby 1974)



yámi	‘eye’
púnjala	‘white’
wátjimpàŋu	‘armpit’
kámalařinji	‘wrist’
yákalâkalâmpa	‘loose’
ŋánkiřikîrimpàyi	‘fought with boomerangs’
ŋámpalâŋinmûkunna	‘at our many’
nářinjmûkunjînamìřa	‘at your own many’
nímpalâŋinmûkunânjimìřa	‘from your own two’

“Initial dactyl effect”

Words with 3, 5, 7, 9σ begin with a ‘dactyl’ óσσ

Is this a ternary foot (óσσ)?

(**´σ**)

(**´σ**)σ

(**´σ**)(**̀σ**)

(**´σ**)σ(**´σ**)

(**´σ**)(**̀σ**)(**̀σ**)

(**´σ**)σ(**´σ**)(**´σ**)

(**´σ**)(**̀σ**)(**̀σ**)(**̀σ**)

(**´σ**)σ(**´σ**)(**´σ**)(**´σ**)

(**´σ**)(**̀σ**)(**̀σ**)(**̀σ**)(**̀σ**)

Probably just an unparsed syllable.

Every word begins with (**´σ**), but the rest of the feet are *right*-aligned, presumably to avoid stress lapse...

(**óσ**)
(**óσ**)σ
(**óσ**)(**òσ**)
(**óσ**)σ(**òσ**)
(**óσ**)(**òσ**)(**òσ**)
(**óσ**)σ(**òσ**)(**òσ**)
(**óσ**)(**òσ**)(**òσ**)(**òσ**)
(**óσ**)σ(**òσ**)(**òσ**)(**òσ**)
(**óσ**)(**òσ**)(**òσ**)(**òσ**)(**òσ**)

TROCHEE

FTBIN

INITIALFOOT

> NOLAPSE

	ALLFTL	NO LAPSE
!! $(\sigma)\sigma(\sigma)$	*!	*
☞ $(\sigma)(\sigma)\sigma$		*

PROBLEM If ALLFTL \gg NO LAPSE

we get the wrong winner

	NO LAPSE	ALLFTL
!! (σσ)σ(σσ)	*	*!
☞ (σσ)(σσ)σ	*	

AND

If NO LAPSE >> ALLFTL

we get the wrong winner

	NOWEAKLAPSE	ALLFTL
☞ (´σ)σ(̀σ)		*
(´σ)(̀σ)σ	*!	

this seems to
solve the problem

Alber suggests that
lapse after primary stress (´σ)σ
is worse than after secondary stress (̀σ)σ
‘= WeakLapse’

	INITIALDACTYL	ALLFTL
☞ (´σσ)(`σ)		*
(´σ)(`σσ)	*!	

but the evidence
for dactyls in
language is weak

Another option would require an initial dactyl

Back to
Ancient
Greece



Most of us
hope that
natural language
uses only two feet

iamb ✓
trochee ✓

and that poetic feet
are combinations of
phonological feet
(Golston & Riad 2000, 2004)

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