

24.961 Stress-2      **Trochaic typology (QI)**

[1]. S" = main stress, S = secondary stress, s = unstressed

Proto-Germanic:	S" s s s s s	S" s s s s s s	S" s s
Pintupi:	S" s S s S s	S" s S s S s s	S" s s
Maranungku:	S" s S s S s	S" s S s S s S	S" s S
Warao:	S s S s S" s	s S s S s S" s	s S" s
Passamaquoddy:	S s S s S s	S S s S s S s	S S s
Garawa:	S" s S s S s	S" s s S s S s	S" s s
Polish:	S s S s S" s	S s S s s S" s	s S" s
Indonesian:	S s S s S" s	S s s S s S" s	s S" s

rules:

Proto-German: one trochee at left edge

Pintupi: trochaic left-to-right

Maranungku: trochaic left-to-right plus degenerate foot

Warao: trochaic right-to-left

Passamaquoddy: trochaic right-to-left plus degenerate

Garawa: one Trochee at left edge, right-to-left of residue  
with no clash or with destressing

Polish: one Trochee at right edge and left-to-right parse of residue

Indonesian: same as Garawa with main stress on right

[2]. **Constraints:** based on McCarthy & Prince (1993)

Ft-Bin: feet are disyllabic

Parse-s: every syllable is parsed by a foot

Align-Ft-L: every foot is aligned with the left edge of the word (gradient evaluation)

Align-Ft-R: every foot is aligned with the right edge of the word (gradient eval)

Align-PW-L: the left edge of the prosodic word is aligned with a foot

Align-PW-R: the right edge of the prosodic word is aligned with a foot

Trochaic: Align the left edge of a foot with a stressed syllable

Iambic: Align the right edge of a foot with a stressed syllable

**[3]. Analysis:**

Germanic: Align-Ft-L >> Parse-s (long lapses allowed)  
Align-Ft-L >> Align-Ft-R: leftward orientation

Pintupi: Parse-s >> Align-Ft-L >> Align-Ft-R: multiple, left-oriented footing  
Ft-Bin >> Parse-s: lapse at right edge in odd-parity words

Maranungku: Parse-s >> Align-Ft-L >> Align-Ft-R: multiple, left-oriented footing  
Parse-s >> Ft-Bin: monosyllabic foot at right edge in odd-parity words

Warao: Parse-s >> Align-Ft-R >> Align-Ft-L: multiple, right-oriented footing  
Ft-Bin >> Parse-s

Passamaquoddy: Parse-s >> Align-Ft-R >> Align-Ft-L: multiple, right-oriented footing  
Parse-s >> Ft-Bin (stress clash in odd-parity words)

Garawa: Germanic+Warao  
Parse-s >> Align-Ft-R >> Align-Ft-L: multiple, right-oriented footing  
Ft-Bin >> Parse-s  
Align-PW-L >> Align-FT-R

Polish: Pintupi+Swahili  
Parse-s >> Align-Ft-L >> Align-Ft-R: multiple, left-oriented footing  
Align-PW-R >> Align-Ft-L

Indonesian: same as Garawa except that main stress is penultimate  
Parse-s >> Align-Ft-R >> Align-Ft-L: multiple, right-oriented footing  
Ft-Bin >> Parse-s  
Align-PW-L >> Align-FT-R  
Align-PW-R >> Align-PW-L

alternative Indonesian analysis (Kenstowicz 1996):  
Main stress is penultimate (top-down effect)

**[4] grammar tour**

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Germanic

/1 2 3 4 5 6/	Align-Ft-L	Parse-s
> (1 2) 3 4 5 6		****
1 (2 3) 4 5 6	*	***
(1 2) (3 4) 5 6	**	**
(1 2) (3 4) (5 6)	**+****	

Pintupi

/1 2 3 4 5 6/	Parse-s	Align-Ft-L
>(1 2) (3 4) (5 6) 7		**+*****
(1 2) 3 4 5 6 7	*****	

/1 2 3 4 5 6 7/	Ft-Bin	Parse-s
> (1 2) (3 4) (5 6) 7		*
(1 2) (3 4) (5 6) (7)	*	

Maranungku

/1 2 3 4 5 6 7/	Parse-s	Align-Ft-L	Align-Ft-R
1 (2 3) (4 5) (6 7)	*	*+***+*****	*****+**
>(1 2) (3 4) (5 6) 7	*	**+*****	*****+***+*

Passamaquoddy

/ 1 2 3 4 5 6 7/	Parse-s	Ft-Bin
>(1) (2 3) (4 5) (6 7)		*
1 (2 3) (4 5) (6 7)	*	

Garawa

/ 1 2 3 4 5 6 7/	Align-PW-L	Align-FT-R
1 (2 3) (4 5) (6 7)	*	*****+**
->(1 2) 3 (4 5) (6 7)		*****+**

Polish

/ 1 2 3 4 5 6 7 /	Align-PW-R	Align-Ft-L
(1 2) (3 4) (5 6) 7	*	**+*****
->(1 2) (3 4) 5 (6 7)		** +*****

Indonesian

/1 2 3 4 5 6 7/	Align-PW-L	Align-FT-R
(1 2) 3 (4 5) (6 7)	*	*****+**
		*****+**

/1 2 3/	Align-PW-R	Align-PW-L
> 1 (2 3)		*
(1 2) 3	*	

[5] Reductive analysis (Kager 2001, Alber 2001/5)

motivations:

- For even parity words with Foot Binariness and Parse-syll undominated, there are just two options, which are covered by Iambic (sS)(sS)(sS) vs. Trochaic (Ss)(Ss)(Ss)

- for odd-parity words where Ft-Bin >> Parse, we have an unparsed syllable
- RK rejects gradient alignment as an anachronism of directional parsing rule
- Licensing constraints proposed on the location of the unparsed syllable
- Certain gaps must be explained

Trochaic family		Iambic family	
(Ss)(Ss)(Ss)s	Pintupi	(sS)(sS)(sS)s	Araucanian
(Ss)(Ss)s(Ss)	unattested	(sS)(sS)s(sS)	not attested
(Ss)s(Ss)(Ss)	Garawa	(sS)s(Ss)(sS)	Chugach
s(Ss)(Ss)(Ss)	Warao	s(sS)(sS)(sS)	not attested
(Ss)(Ss)(Ss)s	Cairene	s(sS)(sS)(sS)	not attested
(Ss)(Ss)s(Ss)	Polish, Piro	(sS)(sS)(sS)s	Creek
(Ss)s(Ss)(Ss)	unattested	(sS)s(Ss)(sS)	not attested
s(Ss)(Ss)(Ss)	Warao	(sS)(sS)s(sS)	not attested

S = primary stress

[6]. constraints:

- a core set that recapitulates basic metrical structures
  - Ft-Binarity: feet are composed of two syllables
  - Parse-syllable: penalize a syllable that is not parsed into a foot
  - Iambic: prominence at right edge of foot
  - Trochaic: prominence at left edge of foot
  - Align-L: left edge of word starts with a foot
  - Align-R: right edge of word starts with a foot
- rhythmically motivated constraints on departures from alternating stress in odd-parity words

\*Lapse: penalize two successive unstressed syllables

Lapse-at-end: a lapse is permitted at the right edge of the domain

Lapse-at-peak: a Lapse is permitted adjacent to main stress

[7]. Model implies a bias against word-initial lapses since there is no constraint permitting a lapse in this position; this bias this abandoned in later work (Kager 2012): cf. América, Monòngahéla, àbracadábra, to#Monòngahéla, àpparátus, apèratíf

harmonic bounding of initial and medial lapses that are not adjacent to a peak

(32) Rhythmic licensing, binary iambs, odd-numbered forms

	*LAPSE	LAPSE-AT-PEAK	LAPSE-AT-END	NON-FIN	END-RULE-L	END-RULE-R	ALIGN-WD-L	ALIGN-WD-R	Example
a. 01)(02)(02)0						*		*	Araucanian
b. (01)(02)0(02)									HB by 32c
c. (01)0(02)(02)	*		*	*		*			Chugach
d. 0(01)(02)(02)									HB by 32c
e. 0(02)(02)(01)									HB by 32g
f. (02)0(02)(01)									HB by 32g
g. (02)(02)0(01)	*		*	*	*				<b>n.a.</b>
h. (02)(02)(01)0					*			*	Creek etc

Kager, René. "A Factorial Typology of Rhythmic Licensing Constraints." *Phonological Studies* 5 (2005): 47-155. © De Gruyter. All rights reserved. This content is excluded from our Creative Commons license. For more information, see <http://ocw.mit.edu/help/faq-fair-use/>.

Polish and Garawa permitted; Indonesian (àme)ri(kàni)(sási) "Americanization" and (dèmi)li(tàri)(sási) are treated as loanwords from Dutch *milité:r* and *amerikán* in which the main stress is preserved as a secondary stress via cyclic (output-output) faithfulness; this faithfulness effect motivates the lapse that is otherwise not permitted by the constraint set since it is neither at a word edge nor adjacent to the main stress

[7]. Licensing of unary feet: Parse-syll >> Ft-Bin

- one strategy places them at the edge, avoiding a clash of two adjacent stresses

(Ss)(Ss)(Ss)(S)      Maranungku  
 (S)(sS)(sS)(sS)      Weri

- the other strategy allows a clash but apparently avoids a clash with main stress S if possible and places the clash at an edge

(Ss)(Ss)(S)(Ss)      unattested  
 (Ss)(S)(Ss)(Ss)      unattested  
 (S)(Ss)(Ss)(Ss)      Passamaquoddy

\*Clash-at Peak: penalize adjacent stresses if one is the main stress  
 Clash at Edge: allow adjacent stresses if at least one is at a word edge

[8] Kager's functional explanation for location of lapses and clashes: "peaks are focal points of rhythmic density that must be compensated in their immediate surroundings by less dense (rarified) portions" (i.e. lapses)

[9] Gordon's (2002) typology for QI systems

- metrical grid but no metrical grouping; constraints on line-1 grid marks

line-1    x  
 line-0   x x x x x x

- corpus of c. 262 lgs.
- constraints:
  - Align-\* to R/L edge (gradient)
  - Align-\* to both edges
  - Non-Finality
  - \*Clash
  - \*Lapse: penalize each pair of unstressed syllables
  - \*Lapse-Left: no more than one syll separates line-1 \* from left edge
  - \*Lapse-Right: no more than one syll separates line-1 \* from right edge
  - \*Extended-Lapse: penalize each triple of unstressed syllables
  - \*Extended-Lapse-Right: no more than two unstressed syllables at right
- typology of fixed stress

Initial: Align-\*L >> Align-\*R, Align-\*Edges  
 Final: Align-\*R >> Align-\*L, Align-\*Edges  
 CF: Align-\*Edges >> Align-\*R, Align-\*L  
 Penult: Non-Fin >> Align-\*R  
 Peninitial: Lapse-L >> Align-\*R  
 Penult-2: Lapse-\*R >> Align-\*L  
 Antepenult: Extended-Lapse-R >> Align-\*L

remarks:

- right edge repels stress: Non-Finality, \*Extended Lapse-Right
- peninitial arises from rightward alignment dominated by \*Lapse-L
- antepenult arises from leftward alignment dominated by \*Extended lapse R
- there is no \*Extended Lapse-L and so no analogue of Macedonian with stress on the third syllable
- this is challenged by Kager (2012)

single stress: alignment dominates lapse

final stress (Farsi)

/s:sss/	Align-*R	Align-*L	*Lapse
> s:sssS		****	***
sssSs	*!	***	**
SsSsS	****+***	**+****	

Peninitial (Lakota)

/s:sss/	Lapse-L	Align-*R	Lapse
> sSsss		***	**
Ssss		****!	***
ssSss	*!	**	**

Antepenult (Macedonian)

/sssss/	Extended-Lapse-R	Align-*L	Lapse
> ssSss		**	**
sssSs		***!	**
sSsss	*!	*	***

[10] Factorial Typology:

Degrees of stress: [0,1,2]

Words up to eight syllables:  $n * 2^{(n-1)}$

12 constraints: permutation: 12! (479,001,600)

output set: eight forms for mono<--->octo-syllabic words

results:

- given 12! possible rankings and the number of possible stress patterns for a set of candidates between one and eight syllables
- 10,823,318,000,000 logically possible output sets
- just 152 possible output sets generated by these constraints of which 79 differ in the location of stress
- generates all six attested single stress patterns

[11] alternating stress: clash and lapse become high ranking

- by referring directly to the presence and absence of grid marks, no grouping into feet is needed to generate the trochaic typology

*Maranungku*: \*Clash, \*Lapse, >> Align-Edges >> Align-\*L >> Nonfin, Align-\*R

\*Lapse >> Align (forces insertion of multiple stresses)

/sss/	*Lapse	*Clash	Align-*L
> SsS			**
Sss	*!		
SSs		*!	

Align-\*L >> Align-\*R

/sssss/	Align-*L	Align-*R
> SsSs	**	**+*
sSsS	*+***	**

Align-Edges >> Non-Fin (derives final stress in odd-parity words)

/sssss/	Align-Edges	Non-Fin
> SsSsS		*
SsSss	*!	

\*Lapse, \*Clash >> Align-Edges (blocks SsSssS, SsSsSS, and SS)

/sssss/	*Clash	*Lapse	Align-Edges	Align-L
> SsSsSs			*	**+*****
SsSsSS	*!			
SsSssS		*!		
sSsSsS			*	*+****+*****

*Pintupi:*

Non-Fin, \*Clash >> Align-Edges >> \*Lapse >> Align-\*L >> Align-\*R

Final stress blocked by Non-Fin; but this entails a lapse so \*Lapse is demoted

/sssss/	Non-Fin	*Lapse
> SsSss		*
SsSsS	*!	

Align-Edges >> \*Lapse ( SsSss beats sSsSs)

/sssss/	Align-Edges	*Lapse
> SsSss	*	*
sSsSs	**!	

*Garawa:*

\*Clash, Non-Fin >> Align-Edges >> \*Lapse >> Align-\*R >> Align-\*L

/ssssss/	Align-Edges	*Lapse	Align-R
> SssSsSs	*	*	6+3+1
SsSsSss	*	*	6+4+2
sSsSsSs	**!		5+3+1
sSsssSs	**!	**	5+1
SssssSs	*	**!*	6+1

The lapse is pushed as far to the left as possible without violating edge stress

*Passamaquoddy:*

\*Lapse, Non-Fin >> Align-\*L, Align-Edges >> Align-\*R, \*Clash

Non-Fin blocks final stress; Align-Edges >> \*Clash forces

/ssss/	*Lapse	Align-Edges	Align-*L
>SsSs		*	**
SSss	*!	*	*
SSSs		*	***
sSSs		**!	***

/sss/	*Lapse	Align-Edges	Align-L	*Clash
>SSs		*	*	*

Sss	*!	*		
sSs		**!		
/sssss/	*Lapse	Align Edges	Align-*L	*Clash
>SSsSs		*	*+***	*
SssSs	*!		***	
sSsSs		**!	*+***	

[12] summary remarks

The constraints in Gordon’s system are phonetically/psycho-linguistically grounded: marking word edges may aid in parsing and \*clash and \*lapse enforce rhythmic distribution of prominence

It is more parsimonious in that it eschews grouping; cf. Kager’s constraint set, which includes constraints against clashes and lapses as well as footing constraints

different intuition from foot parsing, which sees prosody as a “chunking” operation

analogous alternative conceptions of syllabification as waves of sonority vs. constituents with internal headed structure

**selected references**

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