

BBN–ANG–243 Phonological analysis

Prosody: Phrase stress, rhythm & intonation

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topic outline

- ▶ prosody: stress, rhythm, intonation
- ▶ locating stress in phrases and sentences
- ▶ primary stress (tonic), secondary stress, strong unstressed and weak unstressed syllables
- ▶ The End-Weight Principle
- ▶ The Rhythm Rule
- ▶ stress in compounds

prosody /prɒsədi/

- ▶ examination of units **larger than the word**: in phrases and in sentences
- ▶ the elements of prosody are also called **suprasegmentals**: they appear in units 'above' the segments: e.g., the syllable
- ▶ prosody = the study of **stress, rhythm** and **intonation**
- ▶ in literature it also includes tempo, speed, key – all related to the delivery of oral text

stress

- ▶ stress = the **relative prominence of a syllable** over another
- ▶ 'prominence' = basically, **loudness**
- ▶ *da-da-DA-da-da-DA-da*
- ▶ *derive* = *da-DA* *deríve*
develop = *da-DA-da* *devélop*
cinema = *DA-da-da* *cínema*
- ▶ prominence cannot only be signalled by loudness but it can be enhanced by other features, too (e.g., length)

rhythm

- ▶ rhythm/beat = the way stressed syllables follow each other, forming (rhythmic) **feet**
- ▶ a **foot** = a stressed syllable plus the unstressed syllables that follow it
- ▶ *Jeremy played the guitar.*
- ▶ underline the **syllables**
- ▶ *Jeremy played the guitar.*
- ▶ mark the **stressed syllables** with an accent
- ▶ *Jérémy pláyed the guitár.*
- ▶ *| Jérémy | pláyed the gui | tár.*

intonation

- ▶ intonation = the changes in the height of the voice (the **pitch**)
- ▶ *da-da ↗ -da-da-da- ↗ -da-da*
- ▶ intonation is like melody
- ▶ loudness (stress) + pitch (intonation) combine together to create the most prominent syllable in a sentence/phrase/word: the **tonic**
- ▶ *DA-da-da-DA-da-da- ↘ **DA***
- ▶ *Jéremy | pláyed the gui | ↘ **tár.***
- ▶ *da-DA-da-da-DA-da-da- ↗ **DA***
- ▶ *Did | Jéremy | pláyed the gui | ↗ **tár?***

The End-Weight Principle/Rule

- ▶ If there is a sequence of equal stresses, the **last** must become the strongest = the most prominent. = The prosodic “weight” of an utterance must be at the end.
- ▶ this last stressed syllable is the **tonic**:

néw \↘ **bóok**

Amánda \↘ **Cólinder** *sít* \↘ **dówn**

consíderable ex \↘ **pénses** *útterly de* \↘ **strúctive** *He críticized* \↘ **éverything.**

The chíldren mánaged to cárry the súiťcases to the édge of the \↘ **róundabout.**

únbe \↘ **líevable**

- ▶ thus, the tonic is the **only primary stress in the word/phrase/sentence, everything else is downgraded to secondary**

primary stress vs. secondary stress

- ▶ **primary stress of a word/phrase/sentence** = a stressed syllable where – when the word is used in a sentence – the pitch may change, i.e., **the stressed syllable which may potentially become the tonic when put in a sentence**
- ▶ **secondary stress of a word/phrase/sentence** = a stressed syllable, which is always before the primary-stressed syllable and which does not become a tonic when used in a sentence
- ▶ INPUT: *Her new film is unbelievable.*
- ▶ STRESS PLACEMENT: *Her **n**ew film is únbelievable.* 0 1 1 0 10100
- ▶ TONIC PLACEMENT: *Her **n**ew film is únbe- ↘ **l**ievable.* 0 2 2 0 20100

primary stress vs. secondary stress

- ▶ *Ráchel + was + háppy + to + cýcle + hóme* →
- ▶ *Ráchel was háppy to cýcle **hóme**.* = 20 0 20 0 20 1
- ▶ *véry + níce + péople* → *véry níce **péople*** = 20 2 10
- ▶ *phóto + montáge* → *phóto **montáge*** = 20 01

your turn: give the stress levels

- ▶ *Amanda spent a year in the forest.*
- ▶ *Amánda spént a yéar in the **fó**rest.* = 020 2 0 2 00 10
- ▶ *Jim was interested in international law.*
- ▶ *Jím was ínterested in ínternátional **láv**.* = 2 0 200 0 20200 1

The Rhythm Rule

- ▶ as we have seen, each stressed syllable begins a foot:

| *Jím* | *pláyed* | ***tén***nis.

- ▶ often the stressed syllable in the middle is deleted:

| *Jím* _o*played* | ***tén***nis.

- ▶ when three stresses come too closely together, English tends to delete the middle one
- ▶ the stress is deleted but the vowel remains full – thus, the syllable becomes tertiary “stressed”
- ▶ *níce óld **lá**dy* 221 → *níce old **lá**dy* 231
- ▶ *Jápanése **gá**rden* 20210 → *Jápanese **gá**rden* 20310
- ▶ the Rhythm Rule has two applications depending on the position of the middle, deleted stress: 1. between words or 2. within a (longer) word

Rhythmic medial stress deletion (“nice old lady” rule)

- ▶ when three words with main stresses come closely together, with maximally one unstressed syllable between them, the stressed syllable in the middle may optionally be deleted (= reduced to 3ry: vowel quality does not change, the vowel remains a “full” vowel)
- ▶ instead of 3 feet there are 2 now:

Foot 1	Foot 2	Foot 3
<i>níce</i>	<i>óld</i>	<i>lády</i>
<i>níce</i> ◦ <i>old</i>	<i>lády</i>	

- ▶ this reduction is purely a rhythmic rule and is not connected to meaning or emphasis or grammatical role of the word
- ▶ other examples:
 - ▶ *véry nice **péople*** → *véry* ◦ *nice **péople***
 - ▶ *my són **spéaks Híndi*** → *my són* ◦ *speaks **Híndi***
 - ▶ *we stóod **right thére*** → *we stóod* ◦ *right **thére***
 - ▶ *Jóhn **dísappéared*** → *Jóhn* ◦ *dis**appéared***

Rhythmic stress shift (“afternoon tea” rule)

- ▶ if a longer word, with two stresses, is immediately (or with just one unstressed syllable between them) followed by a stressed word, the middle stress may optionally be deleted (= reduced to 3ry)
- ▶ *áfternóon* 201
but: *áfter*₀*noon téa* 203 1
- ▶ the stress in the longer word basically “shifts”: 2 1 → 2 3
- ▶ other examples:
 - ▶ *Jápanése* → *Jápa*₀*ese gárden*
 - ▶ *fiftéen* → *fif*₀*teen gírls*
 - ▶ *sárdíne* → *sár*₀*dine sándwich*
 - ▶ *démocrátic* → *démo*₀*cratic cóuntry*
 - ▶ *récomménd* → *réco*₀*mmend sómething*

nice old lady = afternoon tea

Foot 1	Foot 2	Foot 3
<i>níce</i>	<i>óld</i>	<i>lády</i>
<i>níce</i> ◦ <i>old</i>	<i>lády</i>	
<i>áfter</i>	<i>nóon</i>	<i>téa</i>
<i>áfter</i> ◦ <i>noon</i>	<i>téa</i>	

your turn: give the stress levels

- ▶ *We had a nice old lady for afternoon tea.*
- ▶ *We hád a níce óld lády for áfternóon **téa**.* = 0 2 0 2 2 2 0 2 0 2 **1** →
- ▶ *We hád a níce _old lády for áfter_onoon **téa**.* = 0 2 0 2 3 2 0 2 0 3 **1**

- ▶ *Ann's two dogs ran wild.*
- ▶ *Ánn's twó dógs rán **wíld**.* = 2 2 2 2 **1** →
- ▶ *Ánn's _otwo dógs _oran **wíld**.* = 2 3 2 3 **1**

locating phrase/sentence stress

- ▶ in connected speech, the general rule is to **stress every content-word**, and leave **function-words unstressed**
- ▶ *I think Amanda should write Jennifer a letter.*
- ▶ *I thínk Amánda should wríte Jénnifer a létter.*
- ▶ **content-words:** N, V, Adj, Adv (including adverb particles: *get up*, *sit down*, numerals, interrogative & demonstrative pronouns (*who*, *this*, *that*), negative words (*not*, *won't*)
- ▶ **function-words:** auxiliaries, pronouns, articles, conjunctions, prepositions

your turn: which words are stressed?

- ▶ *They offered to pay but I don't want them to.*
- ▶ *They óffered to páy but I dón't wánt them to.*
- ▶ *They óffered to páy but I dón't **wánt** them to.*

- ▶ *Amanda and Jennifer should wait for us.*
- ▶ *Amánda and Jénninger should wáit for us.*
- ▶ *Amánda and Jénninger should **wáit** for us.*

tertiary “stress”?

- ▶ we have seen that from a prosodic point of view, there are 2 stresses: primary and secondary
- ▶ unstressed syllables typically contain one of the **reduced** vowels:

/ə ɪ ɪj əw/:	<i>sálad</i> /sáləd/, <i>crédit</i> /krédɪt/	10
	<i>ínstrument</i> /ínstrəmənt/	100
	<i>háppy</i> /hápij/	10
	<i>Ándrew, válué</i> /ándrəw vóljəw/	10
- ▶ some unstressed syllables may contain a **full** vowel, such syllables are sometimes called **tertiary stressed** (or **strong unstressed**)
- ▶ these syllables are **not stressed** (not loud) and can **never become 1ry stressed (tonics)** – the End-Weight Principle does not “see” them

tertiary stress is not a stress prosodically

shalot /ʃəlɒt/

*That box contains a shaló*t.

alcohol /alkəhɒl/

*That box contains ál*cohol.

**That box contains ál*cohól.

- ▶ based on this the /ɒ/ in *shalot* has lexical 1ry stress but in *alcohol* it has 3ry stress (strong-unstressed)
- ▶ also: tertiary “stressed” syllables behave differently from stressed syllables with respect to the **Rhythm Rule**

Rhythmic stress shift and tertiary “stress”

- ▶ tertiary “stress” cannot be stress because the Rhythm Rule does not apply:
- ▶ *Octóber* is 310 /ɔktówbə/
- ▶ let’s suppose the vowel in the 1st syllable /ɔ/ has “real” stress:
Óctóber + *ráin* → *Óc_otóber ráin*
- ▶ but this is not grammatical, the right stress pattern is:
Octóber ráin (no deletion of middle stress+stress on 1st syllable)
- ▶ 3ry “stress” is then **not** a stress from a prosodic point of view (it is just a syllable which happens to contain an unstressed but “full” vowel)
- ▶ *salvátion*, *Salvátion Ármý* (**Sálvation Ármý*)
Montána, *Montána béar* (**Móntana béar*)
Títánic, *Titánic’s bánd* (**Títanic’s bánd*)

compounds

- ▶ *We sáw an increíblely úgly **pétrol** station.*
- ▶ stress in ***pétrol** station* is 10 30
- ▶ but based on the End-Weight Rule, shouldn't it be *pétrol **státion*** 20 10?
- ▶ no, because it is a **compound**

what are compounds?

- ▶ lexical(ized) units made up of two or more free stems (= words), they are not created “online”, like phrases
- ▶ compounds often have something special in their meaning, something beyond the mere sum of their parts
- ▶ *He bought a new car. Have you seen the black car?*
- ▶ *blackboard, blackbird, mousepad, paperback, railway, hard disk, coffee shop*

spelling of compounds

- ▶ not consistent. . .
- ▶ one word: *greenhouse, schoolboy, dishwasher, egghead, screensaver*
- ▶ with a hyphen: *word-final, write-off, can-opener, fun-loving, hair-raising*
- ▶ most are written as two words: *car ferry, geography teacher, Fifth Street, brick wall, fire alarm*
- ▶ similar in Hungarian: *rézdrót* ‘copper wire’, *jószívű* ‘kind-hearted’; *káposzta-savanyító* ‘cabbage-sourer’; *mérges kígyó* ‘venomous snake’, *bakot lő* ‘blunder’

stressing of compounds

- ▶ 2 types of compounds with respect to stress
- ▶ **initially-stressed compounds, pattern: [[1] [3]]**: *gréenhouse*, *cár ferry*, *compúter virus*, *Fíft^h Street*
- ▶ **finally-stressed compounds, pattern: [[2] [1]]**: *tráde únion*, *frúit sálad*, *Victória Státion*, *Fíft^h Ávenue*
- ▶ which compound has which stress pattern is mostly lexical (has to be learnt)

stress in phrases and compounds

- ▶ stress in phrases: End-Weight Rule: tonic on the last content word
- ▶ *(We are using a) new book.*
- ▶ *(We are úsing a) néw \bóok. 2 1*

- ▶ initially-stressed compound: **the Compound Stress Rule** “bleeds” the End-Weight Rule (= once two words have been compounded, the position of the tonic stays fixed):
- ▶ *(I'll make some) orange juice.*
- ▶ Compound Stress R.: *(I'll máke some) \órange juice. 1 3*
- ▶ End-Weight R.: — doesn't apply —
- ▶ **órange \júice (2 1)*

your turn: give the stress pattern

- ▶ *Some people have red skin.*
- ▶ *Some péo^{le} há^{ve} ré^d skín. (phrase: 2 1)*
- ▶ *That man is a red skin.*
- ▶ *That mán is a ré^d skin. (compound: 1 3)*
- ▶ *I met an English teacher.*
- ▶ *as a phrase: I mét an Énglish **té**acher. 2 1*
- ▶ *as a compound: I mét an **É**nglish teacher. 1 3*

initially-stressed compounds

- ▶ nouns: **gr**eenhouse, **car** ferry, **scr**eensaver, **can**-opener, **sh**óplifting, **pá**perback, **blá**ckboard, **blá**ckbird
- ▶ adjectives: **wá**terproof, **fún**-loving, **trú**stworthy, **sún**lit, **sé**asick
- ▶ verbs: **bá**by-sit, **bél**ly-dance, **á**ir-condition, **chá**in-smoke

obscured compounds

- ▶ in some compounds the 3ry “stress” has become completely reduced
 $1\ 3 \rightarrow 1\ 0$
- ▶ *póstman* /-mən/, *wélcome* /-kəm/, *cúpboard* /-bəd/, *nécklace* /-ləs/,
fórehead /-ɪd/, *bréakfast* /-fəst/, *vínyard* /-jəd/, *daisy* (from *day’s*
eye), etc.

finally-stressed compounds

- ▶ prosodically they are like phrases (but not syntactically/semantically!), stress pattern: 2 1
- ▶ *That's a néw wáll.* (phrase) = *That's a bríck wáll.* (compound)
- ▶ *The wrestler had a very cómpact bódy.* (phrase)
= *Very few people use a cómpact dísk.* (compound)

finally-stressed compounds: nouns

- ▶ ‘2 is/is made of 1’: *brick wáll, frúit sálád, potátó chíps*
- ▶ ‘2 is (a) 1’: *tóy sóldier, chíld áctor, Lórd Máyor, júnk fód*
- ▶ names of places (except *Street*): *Fíft^h Ávenue, Cént^ral Párk, Victó^ria Státion, Hé^roes’ Sqú^are, Cróm^well Ró^ad, Lóⁿdon Brí^dge,
— but: *Fíft^h Street**
- ▶ initials: *DJ /díj dʒéj/, OK /ów kéj/, BBC /bíjbíjsíj/, MTV /émtíjvíj/*
- ▶ others: *Só^cial Démocrat, bláck má^rket, Cóca-Có^la, wé^ekénd
(AmE: *wéekend*)*

finally-stressed compounds: other categories

- ▶ adjectives: *éasy-góing*, *úser-fríendly*, *dúty frée*, *dárk brówn*
- ▶ 2nd element is a participle: *bád-témpered*, *wéll-desérvéd*
- ▶ adverbs: *héad-first*, *úpstáirs*, *Nóρθ-Éast*
- ▶ verbs: *dówngráde*, *cróss-exámíne*, *óversléep*

phrase vs. compound stress

<i>The tourists found</i>	drínking water.	1 + 3, initially-stressed compound
<i>The tourists were</i>	drínking wáter .	2 + 1, syntactic phrase
<i>The tourists found</i>	rúnning wáter .	2 + 1, finally-stressed compound

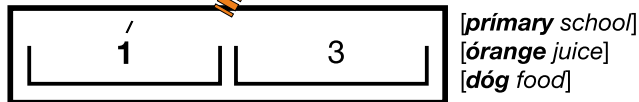
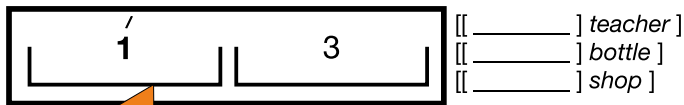
compound embedding

general scheme of initially-stressed compounds



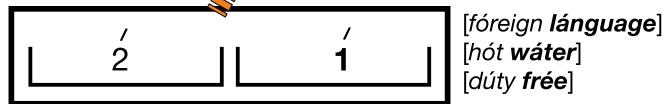
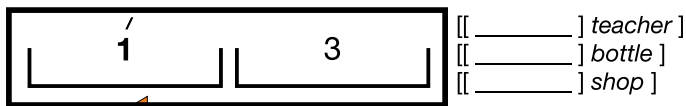
***É**nglish teacher, **phý**sics teacher, **pho**nétics teacher ...
milk bottle, **jú**ice bottle, **wá**ter bottle ...
pét shop, **fó**od shop, **tó**y shop ...*

initially-stressed [1 3] into initially stressed [1 3] → [1 3 3]



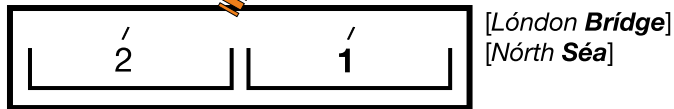
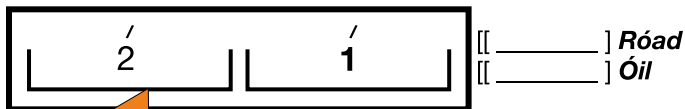
1 3 3
[primary school] *teacher*
[orange juice] *bottle*

finally-stressed [2 1] into initially stressed [1 3] → [2 1 3]



2 1 3
 [[*fóreign **lá**nguage*] *teacher*]
 [[*hót **wá**ter*] *bottle*]
 [[*dúty **frée***] *shop*]

finally-stressed [2 1] into finally stressed [2 1] → *[2 1 1] → [2 2 1] or [2 3 1]



2 3 1
[[*Lóndon* *Bridge*] ***Róad***]
[[*Nóρθ* *Sea*] ***Óil***]

Greek compounds

- ▶ words coming from Greek
- ▶ *sympathy, dialogue* = *sym+pathy, dia+logue*
- ▶ two components are fairly independent, and have describable meaning
- ▶ the second element, if monosyllabic, will preserve its strong vowel:
mono+graph /**mónəgrɑ:f**/, not /-græf/,
dia+logue /**dájəlɔg**/, not /-læg/
- ▶ yet they do not occur as words on their own, “bound stems”

Greek compounds

- ▶ Greek-initial components
mono-, ana-, thermo-, poly-, ...
- ▶ Greek-final components
-graph, -logy, -meter, -phone, ...

Greek compounds

- ▶ at least three syllables long
- ▶ stress is on the **antepenult** of the whole compound, irrespective of how many syllables the two components have

Greek compounds

		antepenult	penult	ult
		mó	no+	graph
		sým+	pa	thy
	a	ná+	lo	gous
trí	go	nó+	me	try

Greek compounds

1st component		2nd component		
		1 syllable		2 syllables
1 syllable		—	sým+pathy	sýn+chrony
			hóm+onym	trí+logy
			án+archy	éx+odus
2 syllables	móno+graph	árhoi+tect	aná+logy	catá+strophy
	díno+saur	ástro+naut	thermó+meter	kiló+metre
	phóto+graph	psýcho+path	monó+tonous	metró+polis
	cáta+logue	téle+phone	pentá+meter	antí+thesis
3 syllables	arísto+crat	icóno+clast	áristó+cracy	páleó+graphy
			méteoró+logy	chóreó+grapher

Greek compounds

- ▶ compare *phótopopy* /fɔ̃wtəwkɔpij/ – *photógraphy* /fətógrəfij/
- ▶ *phótopopy* is a regular compound (two free stems), *photógraphy* is a Greek compound (one word, two bound stems) – notice the vowels and the stress