

Phonology

speech sounds and their functions

Introduction to Linguistics
Kirsten Middeke
Institut für Englische Philologie
2020

sounds and their functions

PHONEMES

dialectal variation



Robin Hood, voiced by British actor
BRIAN BEDFORD, from West
Yorkshire

ch[æ:ə]nces

taki[n]

r[o:]pe

R[ɑ:]bin

ch[a:]nces

j[əʊ]ki[ŋ]

r[b]b

Little John, voiced by American
actor PHIL HARRIS, raised in
Tennessee

oppositions within the system

rob

rib

rub

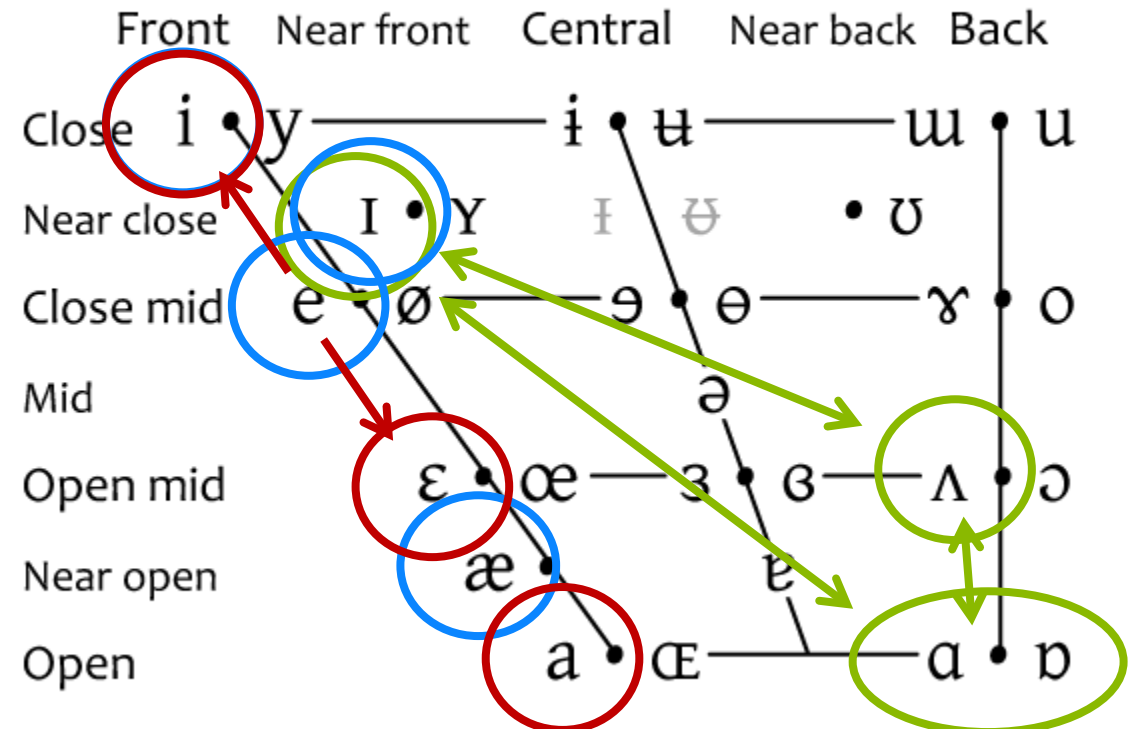
bead

bid

bed

bad

vowels



Vowels at right & left of bullets are rounded & unrounded.

positional variation

- *tick* → aspiration: [t^h]
- *stick* → no aspiration: [t]
- *knit* → no release: [t¹]

positional variation

- *tick* → aspiration: [t^h]
- *stick* → no aspiration: [t]
- *knit* → no release: [t^ɾ]

/t/, /s/, ...
phonemes

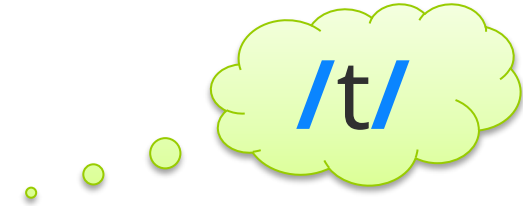
[t^h], [t], [t^ɾ]
different allophones of /t/

terminology and concepts

phoneme

mental representation

abstraction over all the various phones that fulfill the same function in a language

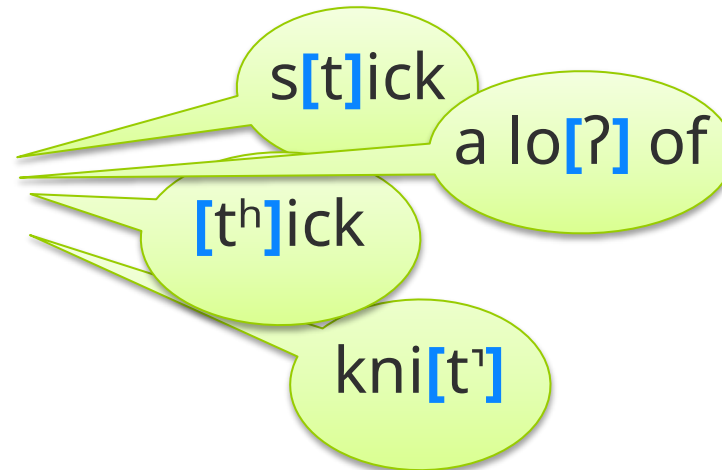


phone

the physical realisation of a speech sound

allophone

a specific realization of a phoneme



<t>, <tt>
different spellings for /t/

notation

phoneme

/t/

phone

[t]

phonemic (phonological) transcription

/tɪk/

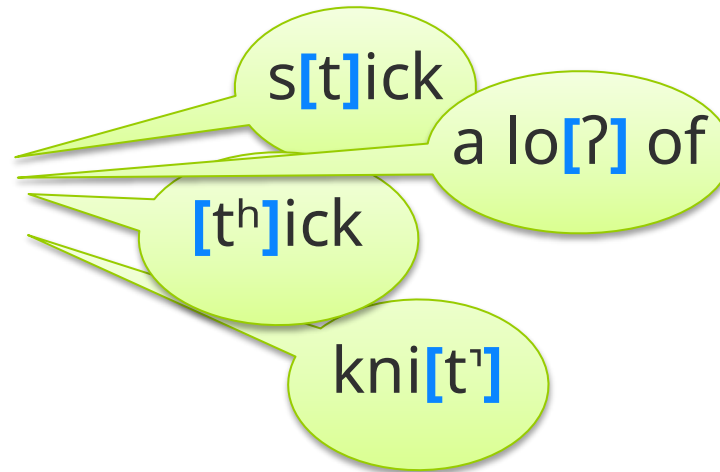
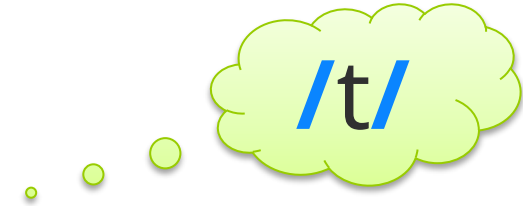
phonetic transcription

[t^hɪk^ɾ]

spelling

<tick>

tick



a lo[?] of

<t>, <tt>
different spellings for /t/

phonemes

contrastive distribution

smallest meaning-distinguishing unit

minimal pairs	phonemes	contrasting features
<i>pit</i> /pɪt/ - <i>bit</i> /bɪt/	/p/ vs. /b/	voicing
<i>sit</i> /sɪt/ - <i>shit</i> /ʃɪt/	/s/ vs. /ʃ/	place of art. (alveolar vs. post-alveolar)
<i>knit</i> /nɪt/ - <i>wit</i> /wɪt/	/n/ vs. /w/	...
<i>kit</i> /kɪt/ - <i>git</i> /gɪt/	...	
<i>fit</i> /fɪt/ - <i>hit</i> /hɪt/		
<i>lit</i> /lɪt/ - <i>writ</i> /rɪt/		

Phonemes are language-specific

EUdict :: Japanese-English dictionary

Results for: suriru		Translations: 1 – 1 / 1
 JAPANESE	 ENGLISH	
suriru	thrill	
Search time: 0.001 seconds.		

Japanese /r/ → [r] ~ [l]

English /s/ vs. /t/

Thai /s/ → [s] ~ [t]

< प > /pa/
< फ > /p^ha/
< ब > /ba/

devanagari script

phonemes and allophones

[biɫ]	‘(he) was’	[bil]	‘true story’
[poɫka]	‘shelf’	[polka]	‘polka’
[jeɫ]	‘(he) ate’	[jel]	‘pine-tree’
[meɫ]	‘chalk’	[mel]	‘shoal’ (an area of shallow water)
[piɫ]	‘passionateness’	[pil]	‘dust’
[ɫuk]	‘onion’	[luk]	‘hatch’
[gaɫka]	‘jackdaw’ (a bird)	[galka]	‘pebble’

from Plag et al. 2009: 67

allophones

English:

- /t/** → beginning of the syllable, before vowel: [t^h] *except if*
- preceded by /s/: [t]
- end of the word/syllable: [t^ʰ]

complementary distribution
conditioned by the phonological environment

German:

- /x/** → after front vowel: [ç] *Licht, schle^{ch}t, lä^{ch}elt, Lö^{ch}er, sü^{ch}tig*
- after back vowel: [x] *Such^t, la^{ch}t, Lo^{ch}*

neutralization

German:

/b,d,g/ ~ /p,t,k/

→ *mein Rad* [t] < /d/

→ *mein Rat* [t] < /t/

final devoicing (Auslautverhärtung)

Turkish:

/b,d,g/ ~ /p,t,k/

→ *kitap* [p] 'book'

→ *kitabım* [b] 'my book'



phonetics and phonology

[lœçɐ]

[çɛ|p]

[ɔçɪ]

PIE ***h**₁l̥ng^{wh}-ú-s > Gr. **elak**^hýs (ἐλαχύς) 'little'

PIE *p**h**₂tér > Gr. **patér** (πατήρ) 'father'

PIE ***h**₃d-jó- > Gr. **ózdō** (ὄζω) 'I smell'

phonetics and phonology

A **phonetic** description simply describes the physical facts of the sounds of the language. A **phonemic** description, however, describes the way that these sounds are related to each other for speakers of that particular language. (Crowley & Bower 2010: 65)

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phonotactics and syllable structure

speech sounds in their environments

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WHAT IS PHONOTACTICS?

contrastive distribution

sing /sɪŋ/

sang /sæŋ/

sung /sʌŋ/

song /sɒŋ/

sing /sɪŋ/

sin /sɪn/

sim /sɪm/

complementary distribution

pick [p^hɪk^ɪ], *pack* [p^hæk^ɪ], *put* [p^hʊt^ɪ]

speek [spi:k^ɪ], *spell* [spɛɫ^ɪ], *Spanish* [spæniʃ^ɪ]

tap [tæp^ɪ], *sip* [sɪp^ɪ], *laptop* ['læb.tɒp^ɪ]

complementary distribution

pick [p^hɪk^ɪ], *pack* [p^hæk^ɪ], *put* [p^hʊt^ɪ]

speek [spi:k^ɪ], *spell* [spɛɫ^ɪ], *Spanish* [spæniʃ^ɪ]

tap [tæp^ɪ], *sip* [sɪp^ɪ], *laptop* ['læb.tɒp^ɪ]

word boundary

/p/ → [p^h] | #_

/p/ → [p] | #s_

/p/ → [p^ɪ] | _#

an exercise

Are [ç] and [x] different phonemes in German?

schlicht [ʃlɪçtʰ] – *Schlacht* [ʃlaxtʰ]
schlecht [ʃleçtʰ] – *Schlucht* [ʃlʊxtʰ]
Löcher [lœçe] – *Loch* [lɔx]
lächelt [lɛçəltʰ] – *lacht* [laxtʰ]
süchtig [zʏçtɪç] – *Sucht* [zʊxtʰ]

an exercise

Are [ç] and [x] different phonemes in German?

schlicht [ʃlɪçtʰ] – *Schlacht* [ʃlaxtʰ]
schlecht [ʃleçtʰ] – *Schlucht* [ʃlʊxtʰ]
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lächelt [lɛçəltʰ] – *lacht* [laxtʰ]
süchtig [zʏçtɪç] – *Sucht* [zʊxtʰ]

/x/ → [ç] | V ___
[+FRONT]

/x/ → [x] | V ___
[+BACK]

assimilation

Alveolar Ridge

Hard Palate

Velum

Uvula

[ç]

[x]

Oral Cavity

Lips

Teeth

Epiglottis

Tongue

Pharynx

assimilation

progressive
assimilation


nicht


Nacht

regressive (“anticipatory”)
assimilation


oxi


impossible

assimilation

partial assimilation


impossible


haben wir nicht

complete assimilation

 
assimilation, immodest


ham wa nich

phonotactic restrictions

✓ [Iç]

? [aç]

✓ [sɒŋ]

? [ŋɒs]

phonotactic restrictions

✓ [Iç]

? [aç]

✓ [sɒŋ]

? [ŋps]

✓ #[b,d,g]

? [b,d,g]#

word boundary



✓ [k]

✓ [n]

? [kn] *knee* [ni:]

✓ [p]

✓ [s]

? [ps] *psychology* [saɪ...]

phonotactic restrictions

✓ [Iç]

? [aç]

✓ [sɔŋ]

? [ŋps]

✓ #[b,d,g]

? [b,d,g]#

word boundary

✓ [k]

✓ [n]

? [kn] *knee* [ni:]

✓ [p]

✓ [s]

? [ps] *psychology* [saɪ...]

✓ [rld]#

✗ [dlr]#

✗ #[rld]

world

*...dlr

*rld...

does not occur

syllable structure

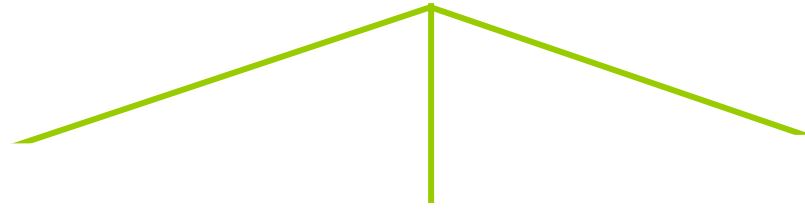
vowels in hiatus:

co-operation
naïve

j	ai	I
sp	u:	you
k	i	ich
	i	spill
	ɒ	kommt
	x	
	l	
	mt	

syllable structure

σ ← a syllable



V

nucleus
(Silbenkern)



j
sp
k

aɪ
uː
ɪ
ɪ
ɒ

x
l
mt

I
you
ich
spill
kommt

phonotactic restrictions

English			German		
<i>split</i>	[spl]	CCC	<i>Spliss</i>	[ʃpl]	CCC
<i>street</i>	[str]		<i>Straße</i>	[ʃtr]	
<i>square</i>	[skw]		<i>Skrupel</i>	[skr]	
<i>texts</i>	[ksts]	CCCC	<i>du herrschst</i>	[rʃst]	CCCC

Japanese		
<i>su.ba.ra.shii</i>	[s] [b] [r] [ʃ]	C
<i>desu</i>	[s]	(C)

sonority and syllabification

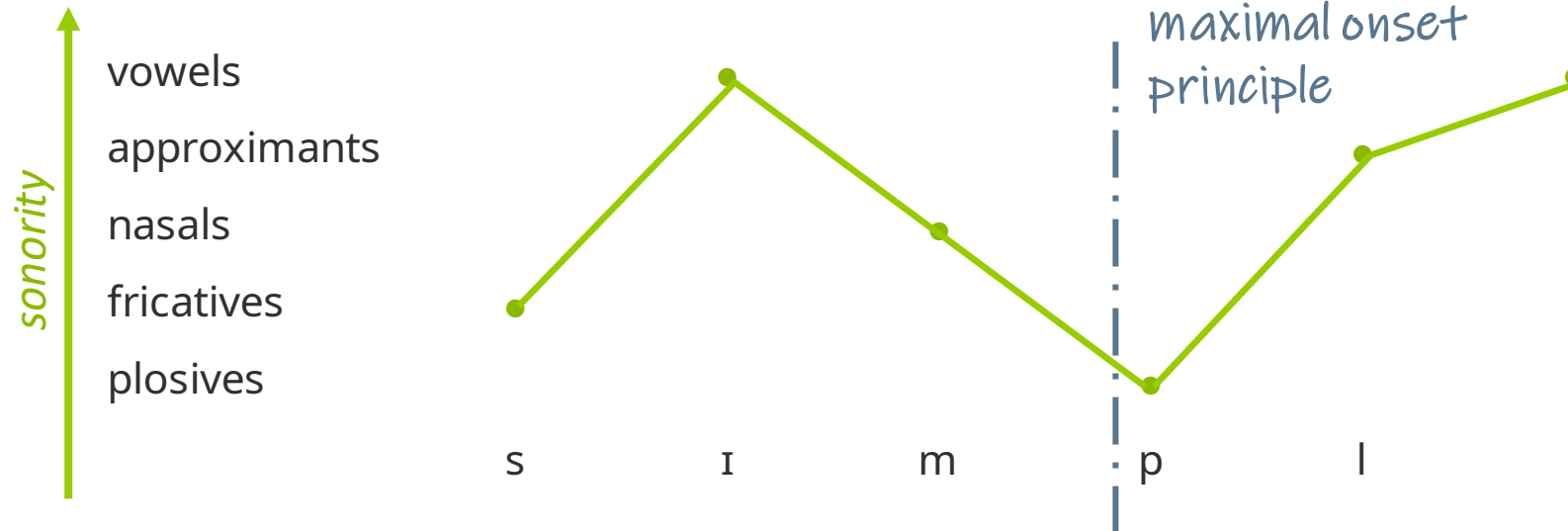
How do you syllabify the word *simply*?

- *si-mply*
- *sim-ply*
- *simp-ly*
- *simpl-y*

sonority and syllabification

the sonority hierarchy

plosives < fricatives < nasals < approximants < vowels



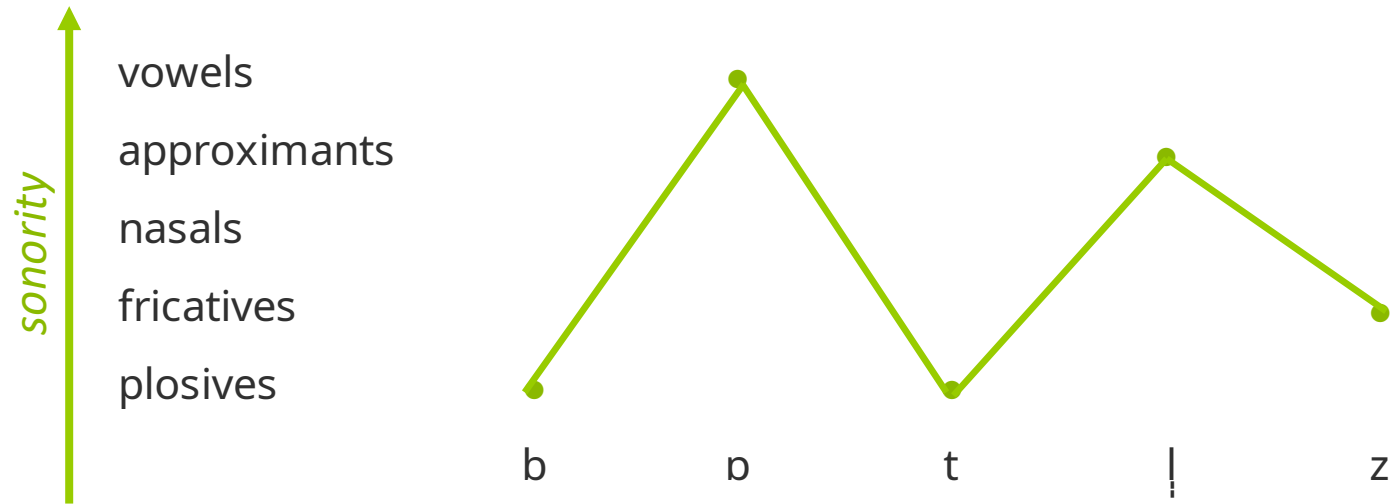
phonotactic restrictions: sonority and syllable structure

- ✓ [rld]# *world*
- ✓ #[tr] *troll*
- ✗ [dlr]# **...dlr*
- ✗ #[rld] **rld...*
- ✗ [tr]# **lotr*

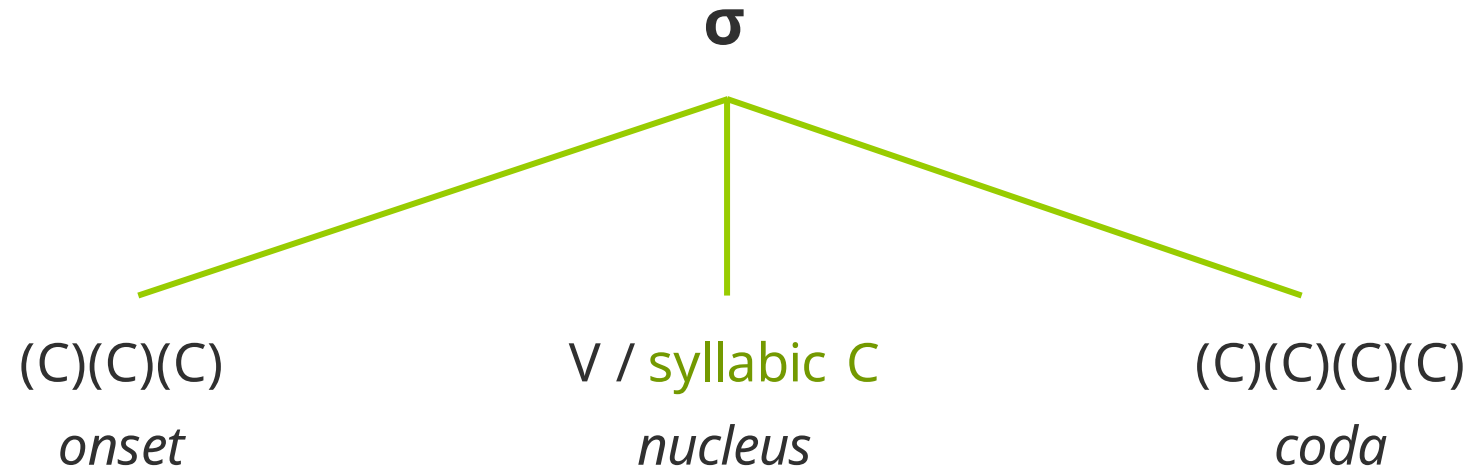
sonority and syllabification

syllabic consonants

bottles /bɒt̚l̩z/
student /stjuːd̩nt/
cupboard /kʌ(p)b̩rd/ (rhotic dialects)



syllable structure



open and closed syllables

peat /'pi:t/ one **closed** syllable

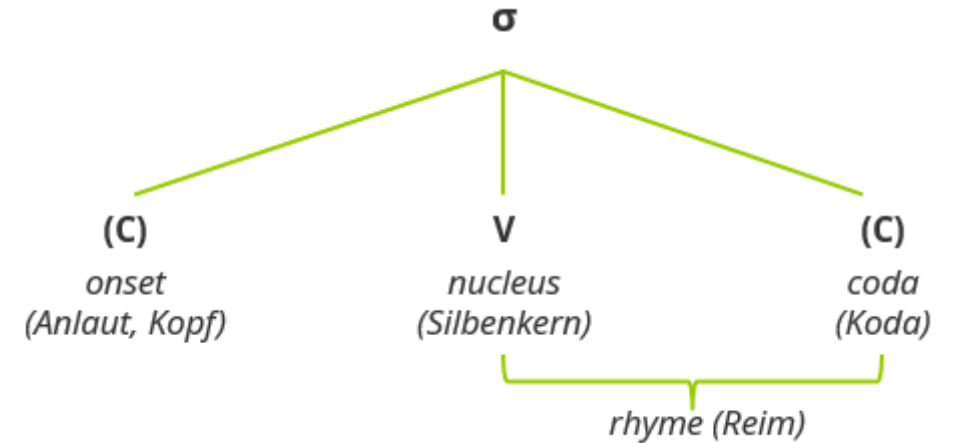
hiragana /hi.ra.ga.na/
ひ ら が な four **open** syllables

kimasu /ki.ma.s(ɯ)/
き ま す

syllable weight

Lat. *mora* (plural *morae* or *moras*), symbolized μ

- \check{V} a short vowel: 1 μ
- \bar{V} a long vowel: 2 μ
- C^* coda consonants: 1 μ

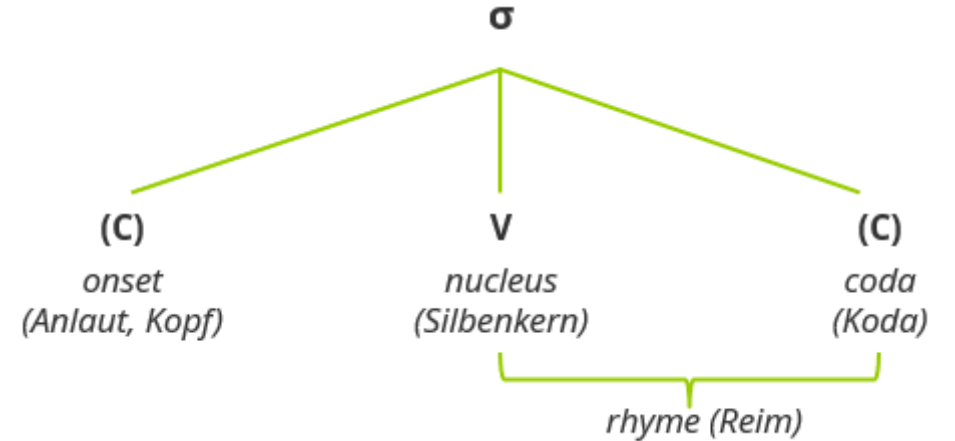


syllable weight

<i>y</i>	/i/	\check{V}	1 μ – light syllable
<i>to</i>	/tə/	$C\check{V}$	1 μ
<i>no</i>	/nəʊ/	$C\bar{V}$	2 μ – heavy syllable
<i>see</i>	/si:/	$C\bar{V}$	2 μ
<i>pit</i>	/pɪt/	$C\check{V}C$	2 μ
<i>peat</i>	/pi:t/	$C\bar{V}C$	3 μ – superheavy sy

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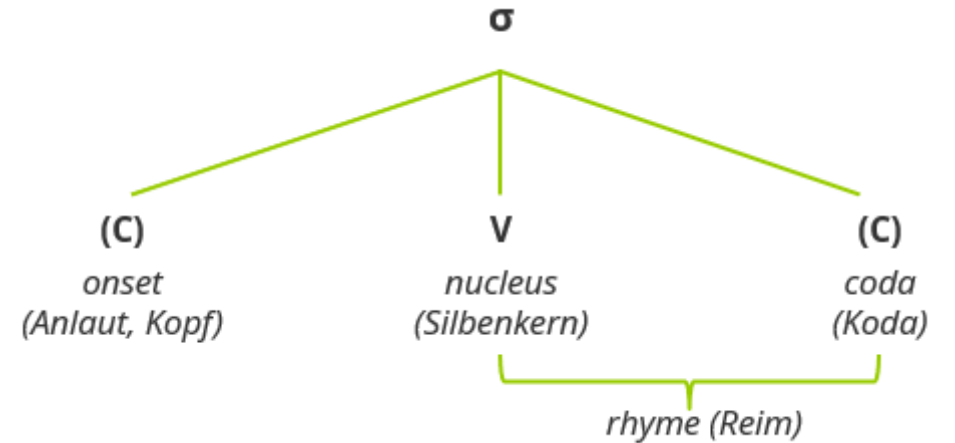


Lat. *mora* (plural *morae* or *moras*), symbolized μ

syllable weight

<i>y</i>	/i/	\check{V}	1 μ – light syllable
<i>to</i>	/tə/	$C\check{V}$	1 μ
<i>no</i>	/'nəʊ/	$C\bar{V}$	2 μ – heavy syllable
<i>see</i>	/'si:/	$C\bar{V}$	2 μ
<i>pit</i>	/'pɪt/	$C\check{V}C$	2 μ
<i>peat</i>	/'pi:t/	$C\bar{V}C$	3 μ – superheavy sy

\check{V} a short vowel: 1 μ
 \bar{V} a long vowel: 2 μ
 C^* coda consonants: 1 μ



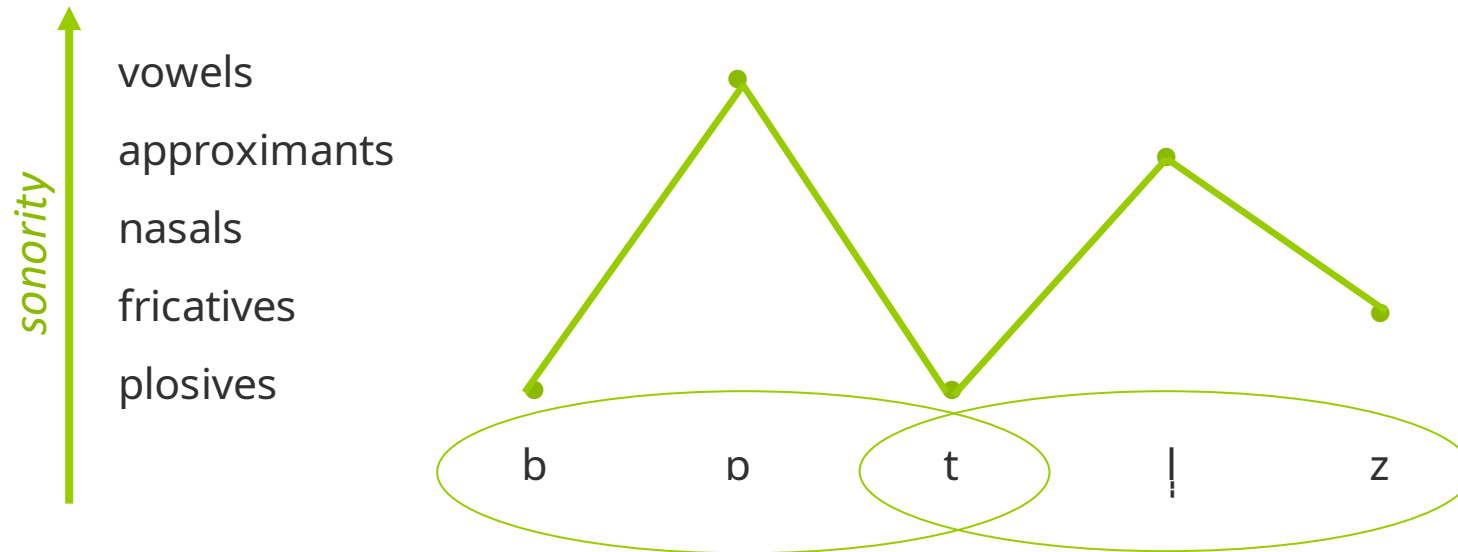
Lat. *insula, festa* > OFr *isle, feste* > modFr. *île, fête*
 modE *bring-s ~ brough-t*

exercises

<i>peat</i>	<i>/'pi:t/</i>	<i>cV̄C</i>
<i>pizza</i>	<i>/'pi:t.sə/</i>	<i>cV̄C.CV</i>
<i>peter</i>	<i>/'pi:tə/</i>	<i>cV̄.CV</i>
<i>peaty</i>	<i>/'pi:ti:/</i> <i>{peat}+{y}</i>	<i>cV̄.cV̄</i>
<i>muse</i>	<i>/'mju:z/</i>	<i>CCV̄C</i>
<i>muesli</i>	<i>/'mju:z.li/</i>	<i>CCV̄C.CV</i>
<i>music</i>	<i>/'mju:zɪk/</i>	<i>cV̄.CVC</i>
<i>musiŋ</i>	<i>/'mju:zɪŋ/</i>	<i>CCV̄.CVC</i>

sonority and syllabification

ambisyllabic consonants



phonotactic restrictions

✓ [Iç]	✓ [k]	✓ [rld]#	<i>world</i>
? [aç]	✓ [n]	✗ [dlr]#	*... <i>dlr</i>
	? [kn] <i>knee</i> [ni:]	✗ #[rld]	* <i>rld</i> ...
✓ [sɒŋ]	✓ [p]		
? [ŋps]	✓ [s]		
✓ #[b,d,g]	? [ps] <i>psychology</i> [saɪ...]		
? [b,d,g]#			

phonotactics and syllable structure

speech sounds in their environments

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phonology

What's it good for?

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phonological knowledge is useful for...

UNDERSTANDING LANGUAGE STRUCTURE AND CHANGE

phonological regularities in language structure

Why is it *intolerant*, but *impolite*, *implausible* but *illogical*, *illegitimate* but *irresponsible*?

(1) bilabial consonants	<i>polite</i>	<i>impolite</i>
	<i>balance</i>	<i>imbalance</i>
(2) alveolar consonants	<i>tolerant</i>	<i>intolerant</i>
	<i>decent</i>	<i>indecent</i>
(3) velar consonants	<i>considerate</i>	<i>inconsiderate</i>
	<i>glorious</i>	<i>inglorious</i>
(4) liquid consonants	<i>logical</i>	<i>illogical</i>
	<i>responsible</i>	<i>irresponsible</i>
(5) vowels	<i>expensive</i>	<i>inexpensive</i>
	<i>official</i>	<i>unofficial</i>
	<i>admissible</i>	<i>inadmissible</i>

phonological regularities in language structure

Why is it *intolerant*, but *impolite*, *implausible* but *illogical*, *illegitimate* but *irresponsible*?

(1) bilabial consonants	<i>polite</i>	<i>impolite</i>		
	<i>balance</i>	<i>imbalance</i>		
(2) alveolar consonants	<i>tolerant</i>	<i>intolerant</i>	/m/	_ C[bilabial]
	<i>decent</i>	<i>indecent</i>	/ŋ/	_ C[velar]
(3) velar consonants	<i>considerate</i>	<i>inconsiderate</i>	/n/ >	/n/ _ { C[alveolar] V
	<i>glorious</i>	<i>inglorious</i>		
(4) liquid consonants	<i>logical</i>	<i>illogical</i>	/l/	_ /l/
	<i>responsible</i>	<i>irresponsible</i>	/r/	_ /r/
(5) vowels	<i>expensive</i>	<i>inexpensive</i>		
	<i>official</i>	<i>inofficial</i>		
	<i>admissible</i>	<i>inadmissible</i>		

↑
any sonorant
(i.e. nasal or liquid)

phonological knowledge is useful for...

LEARNING LANGUAGES

Vowel harmony

Turkish plurals

gün 'day'

gün-ler 'days'

kitap 'book'

*kit**a**b-l**a**r* 'books'

Turkish possessives

fikir 'idea'

*fikr-**i**m* 'my idea'

gün 'day'

*gün-**ü**m* 'my day'

kitap 'book'

*kit**a**b-**i**m* 'my book'

grup 'group'

*gr**u**b-**u**m* 'my group'

phonological knowledge is useful for...

CURRICULUM PLANNING AND DIDACTICS

Rückendiktat

(Group A)

1. Read these words out to your partner slowly and distinctly:

- a) *ice*
- b) *eyes*
- c) *lies*
- d) *lice*

2. Listen to your partner and spell the words you hear.

- a) *l...*
- b) *l...*
- c) *b...*
- d) *b...*
- e) *d...*
- f) *d...*

Rückendiktat

(Group B)

1. Listen to your partner and tick the sound you hear at the end of each word:

- a) /s/ /z/
- b) /s/ /z/
- c) /s/ /z/
- d) /s/ /z/

2. Read these words out to your partner slowly and distinctly:

- a) *lab*
- b) *lap*
- c) *bad*
- d) *bat*
- e) *dog*
- f) *dock*

Rückendiktat

(Group A)

1. Read these words out to your partner slowly and distinctly:

- a) *ice*
- b) *eyes*
- c) *lies*
- d) *lice*

2. Listen to your partner and spell the words you hear.

- a) *l...*
- b) *l...*
- c) *b...*
- d) *b...*
- e) *d...*
- f) *d...*

Rückendiktat

(Group B)

1. Listen to your partner and tick the sound you hear at the end of each word:

- a) /s/ /z/
- b) /s/ /z/
- c) /s/ /z/
- d) /s/ /z/

2. Read these words out to your partner slowly and distinctly:

- a) *lab*
- b) *lap*
- c) *bad*
- d) *bat*
- e) *dog*
- f) *dock*

Rückendiktat

(Group A)

1. Read these words out to your partner slowly and distinctly:

- a) *ice*
- b) *eyes*
- c) *lies*
- d) *lice*

2. Listen to your partner and spell the words you hear.

- a) *l...*
- b) *l...*
- c) *b...*
- d) *b...*
- e) *d...*
- f) *d...*

(1) Bier, (2) wir
(3) vier.

!?!
!?!

Rückendiktat

(Group B)

1. Listen to your partner and tick the sound you hear at the end of each word:

- a) /s/ /z/
- b) /s/ /z/
- c) /s/ /z/
- d) /s/ /z/

2. Read these words out to your partner slowly and distinctly:

- a) *lab*
- b) *lap*
- c) *bad*
- d) *bat*
- e) *dog*
- f) *dock*

phonology

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