Freie Universität Berlin

Seminar 17312
Introduction to Linguistics

Institute for English Philology
Winter Semester 2020/2021

Academic Instructor: Magdalena Borowik

Session 4: Segmental phonology

Phonology: phones, phonemes and allophones

Phonetics vs. phonology

Phonetics: how you *make* sounds (Plag et al. 2009: 9);

Phonology:

"Phonology is the study of the abstract categories that organise the sound system of a language" (ibid.).

It is "[…] concerned with the speakers' knowledge of the sound system of one specific language"; investigates the "sound inventory" of a language and "the function and (mental) organisation of these sounds […]" (Bieswanger & Becker 2017: 58).

Two main **levels of analysis**:

1. **Segmental phonology:** functions of individual sounds (segments) in a language (ibid.); **phonemes** *i.e. idealised sounds*

2. Suprasegmental phonology: combination of sounds *i.e. syllables, phonotactics, assimilation, stress, intonation* (ibid.)

Phonology: https://www.youtube.com/watch?v=L-iyXUFMwNk

Phonemes & Allophones: https://www.youtube.com/watch?v=MTCx2hCxvHQ

Terminology and concepts

PHONEME: ”[...] the minimal distinctive unit in the sound system of the language” (Plag et al. 2009: 36, 232), the mental representation, and abstraction over all the various allophones of what we consider one sound; the smallest meaning-distinguishing units in language” (Bieswanger & Becker 2017: 59).

PHONE: “physical realisation of a speech sound” (Plag et al. 2009: 33)

ALLOPHONE is a specific realisation of a phone (ibid.); allophones are “different phones representing the same phoneme“ (ibid., p. 224). **They do not distinguish meaning** (ibid., p. 36).

Phonetic vs phonemic transcription

Phonology

Phoneme

/t/

In phonemic transcription, we note only abstract phonemes, i.e. those characteristics that make a difference in identifying the word.

Phonetics

Allophone

[t]

The specific realisation of a phoneme can be described in as detailed a manner as you need [tʰ]ick kni[t̚]

[tʰ] aspirated

[t̚] unreleased

Phonetic vs phonemic transcription

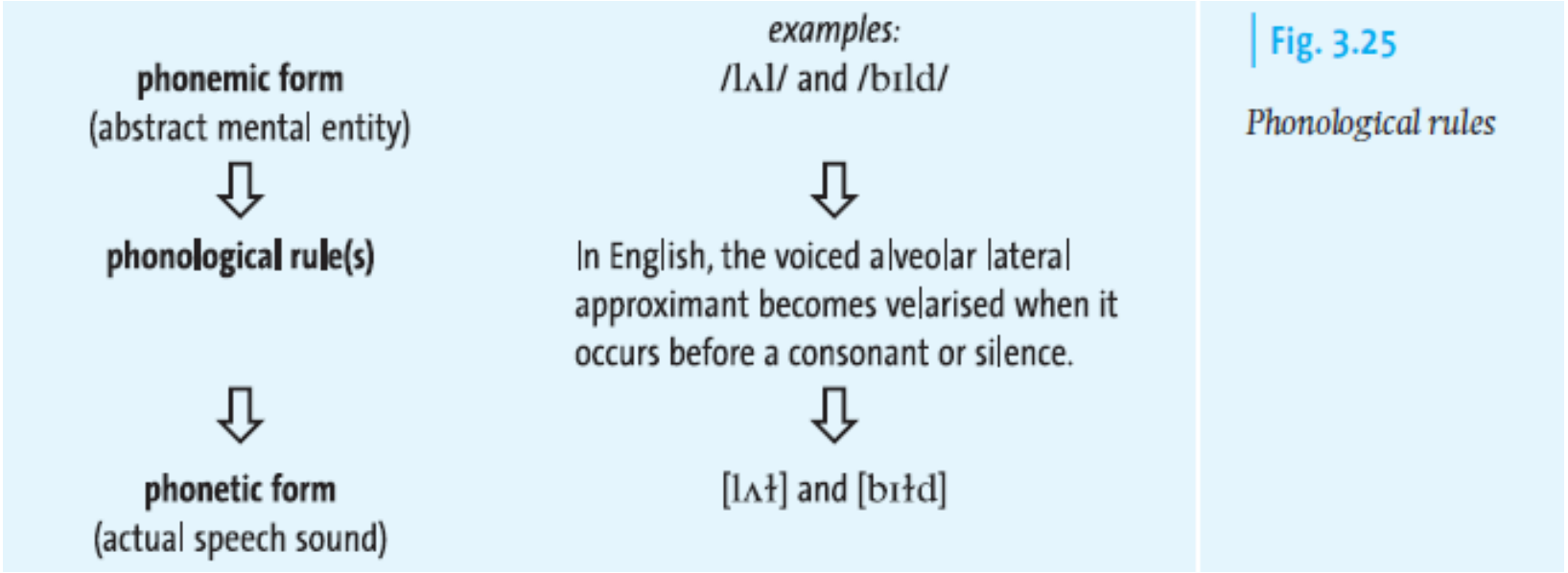


Fig. 3.25

Phonological rules

Bieswanger & Becker (2017: 63)

Phonemes vs. allophones

How do we determine **PHONEME STATUS?**

A minimal-pair test.

MINIMAL PAIR is a pair of words with different meaning that differ in only one sound at the same place (Plag et a. 2009: 36, 230)

bad /bæd/ - *bed* /bed/

pit /pɪt/ - *bit* /bɪt/

sit /sɪt/ - *shit* /ʃɪt/

knit /nɪt/ - *wit* /wɪt/

tick /tɪk/ - *nick* /nɪk/

Tick and *nick* differ in meaning, so the different initial consonants must be phonemes: /t/ vs. /n/.

”[…] constrasting sounds identified by the minimal pair test form the **phoneme inventory** of a language” (Bieswanger & Becker 2017: 59).

Phonemes vs. allophones

Allophones can be in:

1. **free variation**: “different realisations of a linguistic category can occur in the same position” (Plag et al. 2009: 228). Examples:

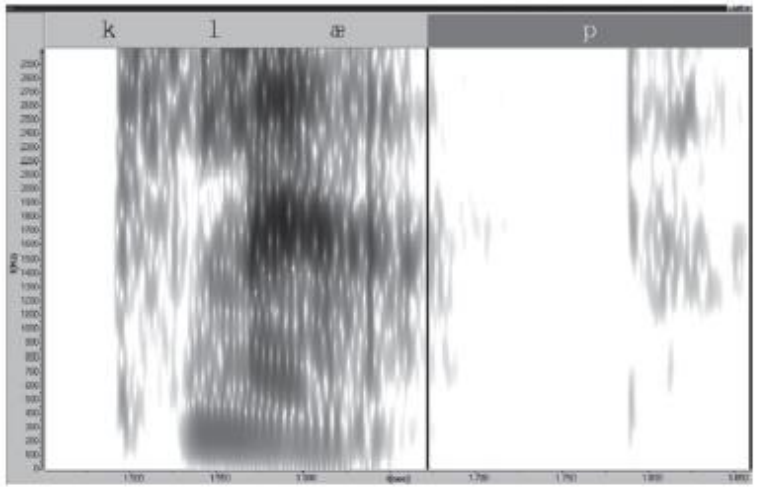
cat: [kʰæt] [kʰæt˺] [kʰæt’] /kæt/

Aspirated plosives: https://www.youtube.com/watch?v=6PSdIctYBsw

Released/unreleased consonants: https://www.youtube.com/watch?v=zNP-D-QTyIo

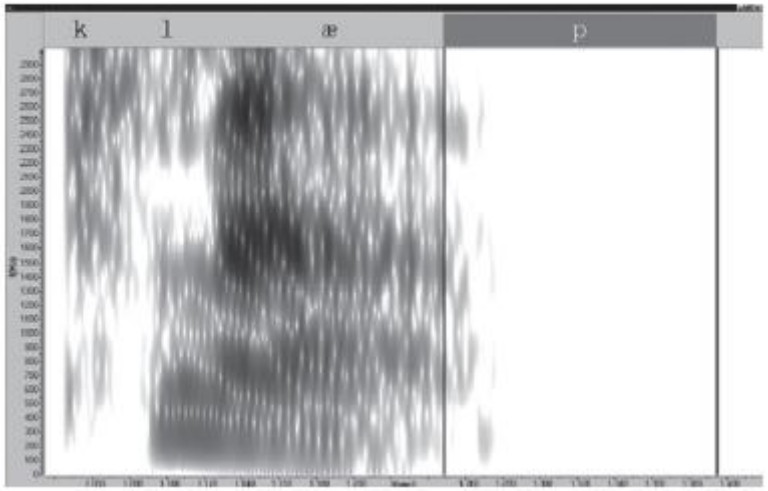
Free variation

(8) a. clap 1



released consonant [p]

b. clap 2



unreleased consonant [p]

Plag et al. (2009: 37)

Phonemes vs. allophones

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2. **complementary distribution**: Two allophones of one phoneme are in complementary distribution if they do not occur in the same environment (Kortmann 2005: 70):

eg. [ɹ̥] after voiceless consonants

[ɹ] in other contexts

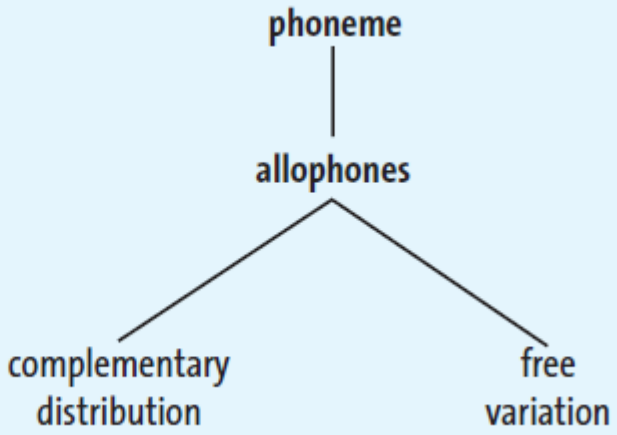
wrap	[ɹæp]	trap	[tɹ̥æp]
room	[ɹuː m]	pray	[pɹ̥ eɪ]
very	[veɹiː]	crude	[kɹ̥ uːd]

DISTRIBUTION: "[...] refers to the different positions in which a speech sound can occur or cannot occur in the words of a language" (Plag et al. 2009: 35)

Allophones: complementary distribution vs free variation

Fig. 3.24

The distribution of allophones



Bieswanger & Becker (2017: 62)

If one allophone cannot occur when the other one does (but they do not distinguish meaning), they are in **COMPLEMENTARY DISTRIBUTION**.

If allophones are in the same environment and do not distinguish meaning, they are in **FREE VARIATION**.

(ibid., p. 61-62).

Complementary distribution: allophones of /l/

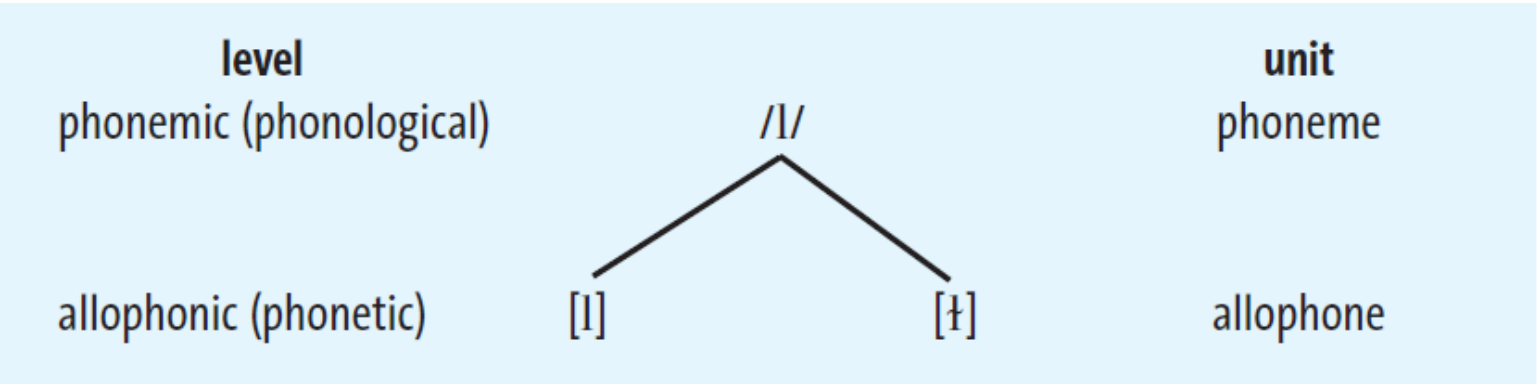


Fig. 3.22

Allophones of the phoneme /l/

Bieswanger & Becker (2010: 61)

https://www.youtube.com/watch?v=zf5laPOZuos

Complementary distribution: allophones of /l/

(15) The distribution of [ɬ]

# __		V __ V		__ #	
*[ɬɪp]	lip	*[mɪɬə]	miller	[pɪɬ]	pill
*[ɬeɪ]	lay	*[sɪɬi:]	silly	[eɪɬ]	ale
*[ɬi:n]	lea n	*[ni:ɬə]	kneeler	[ni:ɬ]	kneel

(16) the distribution of [l]

# __		V __ V		__ #	
[lɪp]	lip	[mɪlə]	miller	*[pɪl]	pill
[leɪ]	lay	[sɪli:]	silly	*[eɪl]	ale
[li:n]	lean	[ni:lə]	kneeler	*[ni:l]	kneel

[ɬ] and [l] are in RP the complementary distribution

Plag et al (2009: 44)

Complementary distribution: allophones of /l/

(15) The distribution of [ɬ]

# __		V __ V		__ #	
*[ɬɪp]	lip	*[mɪɬə]	miller	[pɪɬ]	pill
*[ɬeɪ]	lay	*[sɪɬi:]	silly	[eɪɬ]	ale
*[ɬi:n]	lea n	*[ni:ɬə]	kneeler	[ni:ɬ]	kneel

(16) the distribution of [l]

# __		V __ V		__ #	
[lɪp]	lip	[mɪlə]	miller	*[pɪl]	pill
[leɪ]	lay	[sɪli:]	silly	*[eɪl]	ale
[li:n]	lean	[ni:lə]	kneeler	*[ni:l]	kneel

[ɬ] and [l] are in RP the complementary distribution

Plag et al (2009: 44)

Allophones of /l/

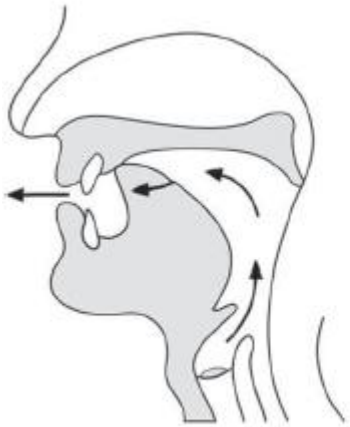
(14) # __		C[– voice] __ V		V __ V		__ #	
[lɪp]	lip	[kl̥ɪp]	clip	[mɪlə]	miller	[pɪɬ]	pill
[leɪ]	lay	[kl̥eɪ]	clay	[sɪliː]	silly	[eɪɬ]	ale
[liːn]	lean	[kl̥iːn]	clean	[niːlə]	kneeler	[niːɬ]	kneel

(ibid. , p. 45)

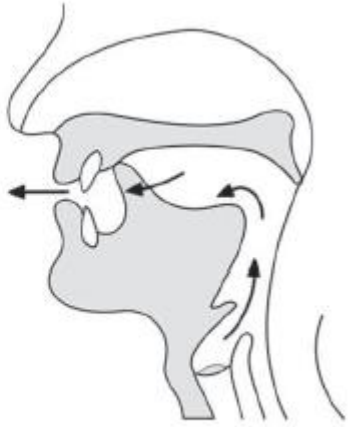
[l] i.e. at the beginning of words, between two vowels; in syllable onsetw

[l̥] voiceless after voiceless consonants

[ɫ] velarised realisation of /l/, ”dark l”, word-final position; in syllable codas



clear l



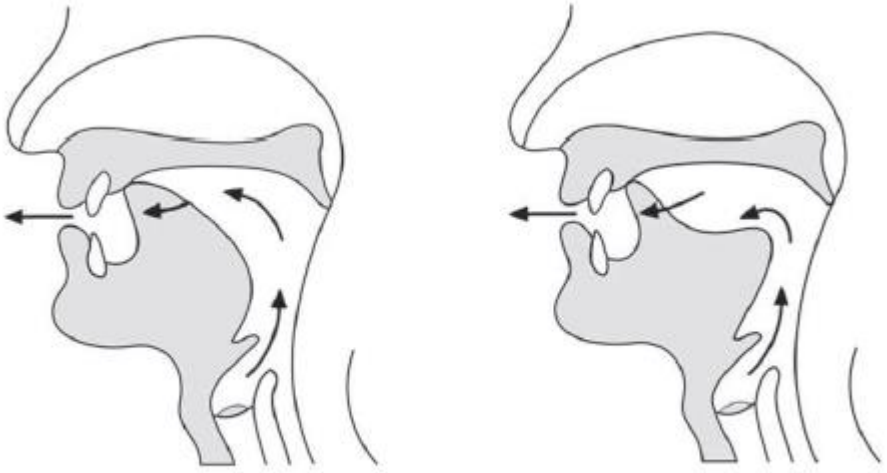
dark l

(ibid., p. 43)

https://www.youtube.com/watch?v=zf5laPOZuos

Complementary distribution: allophones of /l/

- [l] ”light” l (Bieswanger & Becker 2017: 60);
- [ɬ] ”dark l”, velarised variant of the alveolar lateral approximant (ibid., Plag et al 2009: 43);
- [l̥] voiceless (Plag et al 2009: 42)



clear l dark l

(Davis 2004: 22, as cited in Plag et al 2009: 43)

Free variation: released and unreleased stop phonemes /p/ /t/ /k/

a.	/p/			
	clap	[klæp]	or	[klæp̚]
	stop	[stɒp]	or	[stɒp̚]
b.	/t/			
	hat	[hæt]	or	[hæt̚]
	hot	[hɒt]	or	[hɒt̚]
c.	/k/			
	stack	[stæk]	or	[stæk̚]
	duke	[djuːk]	or	[djuːk̚]

Plag et al. (2009: 45)

Aspirated and unaspirated allophones of /p/

(21) The distribution of [pʰ]

# __ V	#[s] __ V	V __ V	__ #
[**pʰ**ɪn]	*[s**pʰ**ɪn]	*[swiː**pʰ**ə]	[hɪ**pʰ**]
[**pʰ**ɪɬ]	*[s**pʰ**ɪɬ]	*[ɹæ**pʰ**ɪd]	[ɹæ**pʰ**]
[**pʰ**eə]	*[s**pʰ**eə]	*[ʃiː**pʰ**ɪʃ]	[kiː**pʰ**]

(22) The distribution of [p]

# __ V	#[s] __ V	V __ V	__ #
*[**p**ɪn]	[s**p**ɪn]	[swiː**p**ə]	[hɪ**p**]
*[**p**ɪɬ]	[s**p**ɪɬ]	[ɹæ**p**ɪd]	[ɹæ**p**]
*[**p**eə]	[s**p**eə]	[ʃiː**p**ɪʃ]	[kiː**p**]

Stop phonemes /p/ /t/ /k/ - aspiration

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[pʰ] stands for aspirated /p/. It means that it is produced with an additional “breath of air” (Plag et al 2009: 46-47)

(21) The distribution of [pʰ]

# __ V	#[s] __ V	V __ V	__ #
[**pʰ**ɪn]	*[s**pʰ**ɪn]	*[swiː**pʰ**ə]	[hɪ**pʰ**]
[**pʰ**ɪɬ]	*[s**pʰ**ɪɬ]	*[ɹæ**pʰ**ɪd]	[ɹæ**pʰ**]
[**pʰ**eə]	*[s**pʰ**eə]	*[ʃiː**pʰ**ɪʃ]	[kiː**pʰ**]

(22) The distribution of [p]

# __ V	#[s] __ V	V __ V	__ #
*[**p**ɪn]	[s**p**ɪn]	[swiː**p**ə]	[hɪ**p**]
*[**p**ɪɬ]	[s**p**ɪɬ]	[ɹæ**p**ɪd]	[ɹæ**p**]
*[**p**eə]	[s**p**eə]	[ʃiː**p**ɪʃ]	[kiː**p**]

- [pʰ] and [p] are in complementary distribution:

1. **word-initially;**
2. **after s;**
3. **between a vowel and between two vowels;**

- [pʰ] and [p] **are in free variation in the word-final context** (ibid., p. 47)

Summary: allophones of the phoneme /p/

Phoneme /p/ can be realised:

- as [pʰ] in word-initial position before vowels (with exception to the case when it is after [s]);
- as [p] between [s] and a vowel and between two vowels;
- as [pʰ] or [p] or [p̚] in word-final position

(Plag et al. 2009: 50)

[ɾ] and [ɹ] in RP

(27)	*very*	[veɾiː]	or	[veɹiː]
	sorry	[sɒɾiː]	or	[sɒɹiː]
	courage	[kʌɾədʒ]	or	[kʌɹədʒ]

- **[ɾ] voiced alveolar flap**
- **[ɾ]** can only occur between two vowels in RP English
- **[ɾ]** and **[ɹ]** are in free variation in RP between two vowels;
- **[ɾ]** and **[ɹ]** and in complementary distribution in word-initial position

(Plag et al. 2009: 51)

https://www.youtube.com/watch?v=J0IYx-WGebg

t/d flapping in General American

- /t/ and /d/ realised as voiced alveolar flap [ɾ] in **word-medial, intervocalic position**
- [ɾ] as an allophone of the phonemes /t/ and /d/
- the tongue taps the alveolar ridge (Plag et al. 2009: 49, Bieswanger & Becker 2017: 63)

word	General American pronunciation
team	[tʰiːm]
tier	[tʰiɹ]
steam	[stiːm]
stole	[stoʊɬ]
writer	[ɹaɪɾəɹ] or [ɹaɪtəɹ]

word	General American pronunciation
deem	[diːm]
dear	[diɹ]
rider	[ɹaɪɾəɹ] or [ɹaɪdəɹ]
medal	[meɾəɬ] or [medəɬ]
hid	[hɪd]
bode	[boʊd]

Videos:

https://www.youtube.com/watch?v=WAs5kPfl_OY

https://www.youtube.com/watch?v=te3Tua6EUng

https://www.youtube.com/watch?v=1FDjhKY8HwM

Non-rhotic and rhotic variaties of English

- In non-rhotic varieties of English, r-sounds do not occur in the word-final position

(30) **base form, __ #**

hear	[hɪə]	*[hɪɹ]
care	[keə]	*[keɹ]
cure	[kjʊə]	*[kjʊɹ]
pour	[pɔː]	*[pɔːɹ]
bar	[bɑː]	*[bɑːɹ]
purr	[pɜː]	*[pɜːɹ]

https://www.youtube.com/watch?v=hWjcoajXRVg

Plag et al. (2009: 50-51)

in RP is realised....

- as [ɹ̥] after voiceless consonants

- as [ə] word-finally after [ɪ], [e] and [ʊ] (i.e. centring diphthongs
- as a ”zero” allophone word-finally after long vowels
- as [ɻ] and [ɾ] in intervocalic positions
- as [ɹ] elsewhere

(32) spelling	RP	General American
hear	[hɪə]	[hiɹ]
care	[keə]	[keɹ]
cure	[kjʊə]	[kjʊɹ]
purr	[pɜː]	[pɜɹ]
pour	[pɔː]	[pɔɹ]
bar	[bɑː]	[bɑɹ]

Plag et al. (2009: 54)

The syllable

- ”A phonological unit consisting of a vowel or other unit that can be produced in isolation, either alone or accompanied by one or more less sonorous units” (Matthews 2014);
- ”Phonological units above the phoneme level that can be vaguely defined as the smallest rhytmic unit of speech” (Bieswanger & Becker 2010: 65);
- A minimum syllable: single vowel in isolation:

<are> /ə/ /ɑː/ (RP) <or> /ə/ /ɔː/ <err> /ɜː/ (RP)

- Some of them have an onset: one or more consonants preceding the centre of the syllable (non-compulsory):

<bar> /bɑː/, <key> /kiː/ (RP)

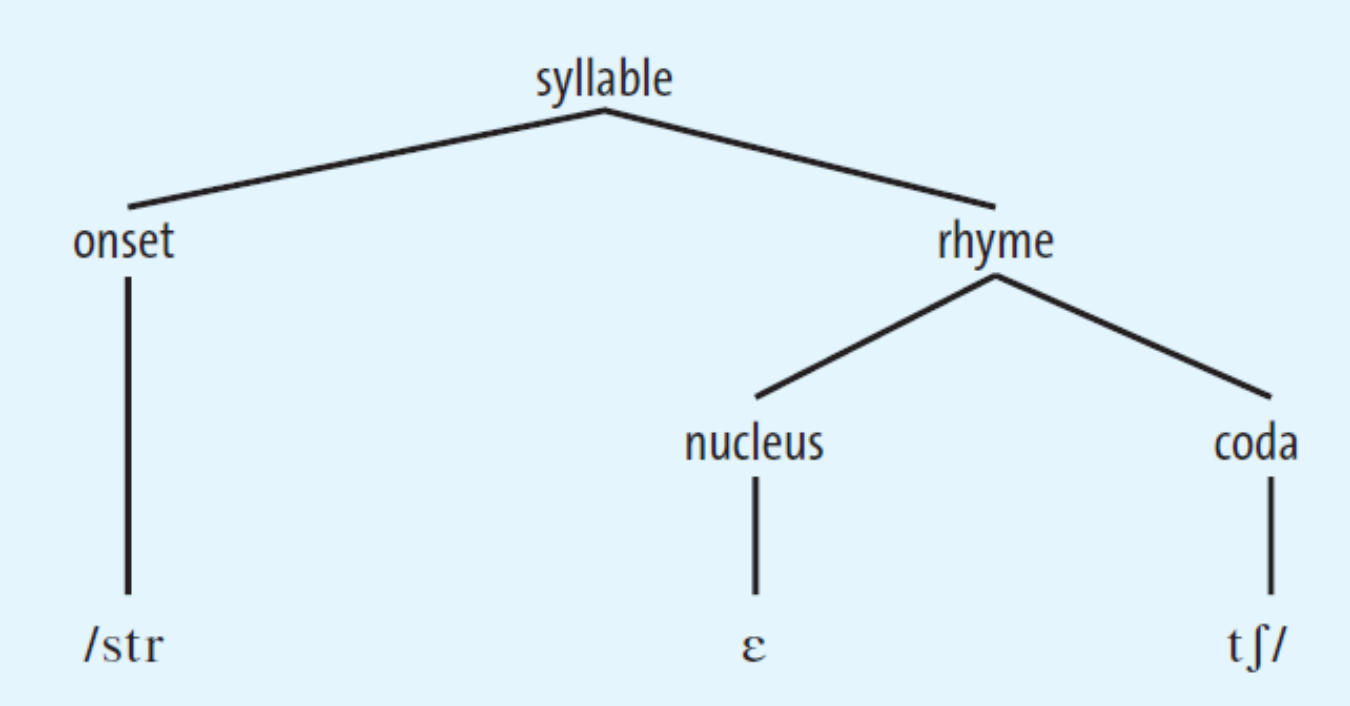
- Some of them have a coda: end with one or more consonants:

<ran> /ræn/ <fill> /fɪl/

- l, w r, j can be in an initial position in a **consonant cluster**: <splay> /spleɪ/, <try> /traɪ/, <stew> /stjuː/

Roach (2009: 56)

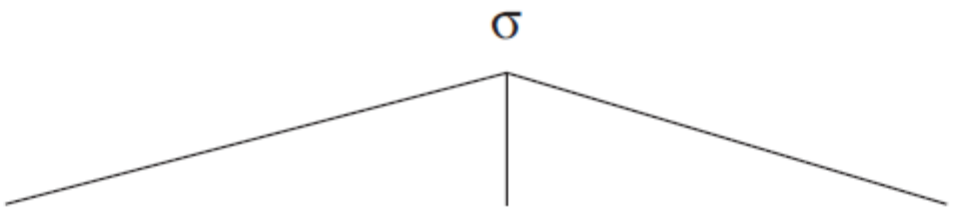
The structure of the English syllable



Source: Bieswanger & Becker (2017: 65)

The structure of the English syllable

(39) The structure of the syllable



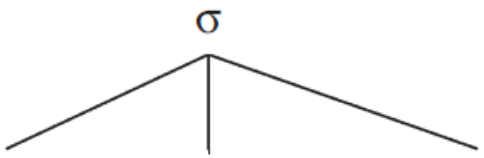
constituents:	onset	nucleus	coda
English:	optional	obligatory	optional
	1 + x consonants	vowel diphthong syllabic consonant	1+ x consonants

Source: Plag et al (2009: 57)

Nucleus is sometimes referred to as peak (Roach 2009: 74)

Example of a syllable division

- Elements of a syllable are called **CONSTITUENTS**



	C *(optional)*	**V** *(obligatory)*	**C** *(optional)*
Alfred, Al			
[æl]		æ	l
[fɹəd]	fɹ	ə	d
Susan, Sue			
[suː]	s	uː	
[zən]	z	ə	n
Patricia			
[pə]	p	ə	
[tɹɪ]	tɹ	ɪ	
[ʃə]	ʃ	ə	
Trish			
[tɹɪʃ]	tɹ	ɪ	ʃ

Plag et al (2009: 56)

Syllabification

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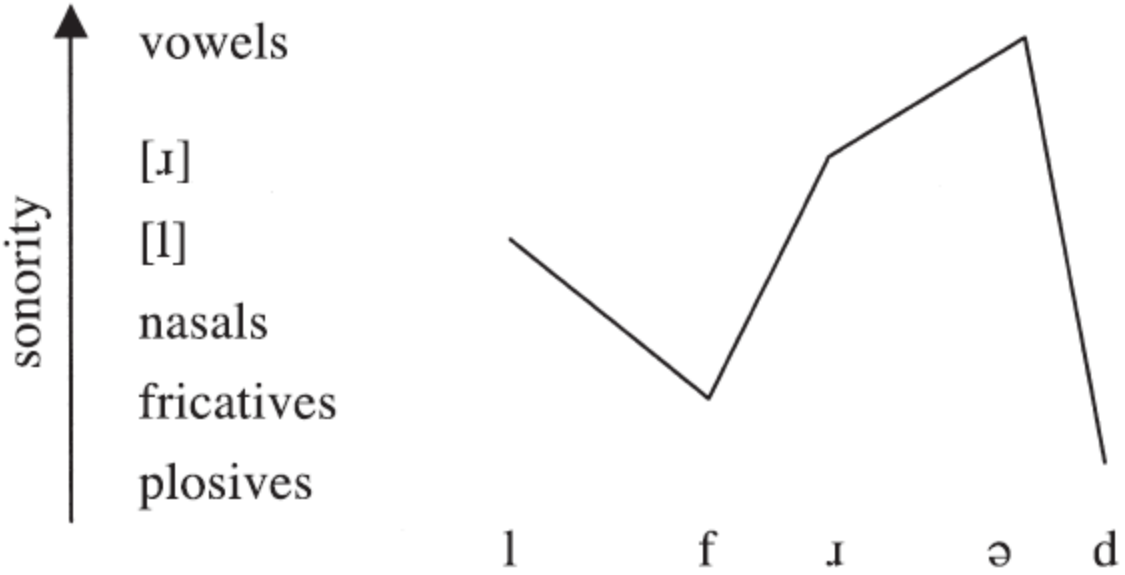
- How would you divide this word? *ekstra* (Roach 2009: 61)
- e.kstra
- ek.stra
- eks.tra
- ekst.ra
- ekstr.a
- The Maximal Onset Principle: as many consonants as possible in the onset, but nucleaus has to be „the most clearly audible part of the syllable“ -
- **SONORITY SEQUENCING PRINCIPLE:** ”sounds preceding the nucleus (i.e. onsets) must raise in sonority, and sounds ”following the nucleus (i.e.) must fall in sonority (Plag et al 2009: 61)
- sonority: ”clear audability”; measured in relation to other sounds (ibid., p. 60)

Sonority scale

(44) Sonority scale

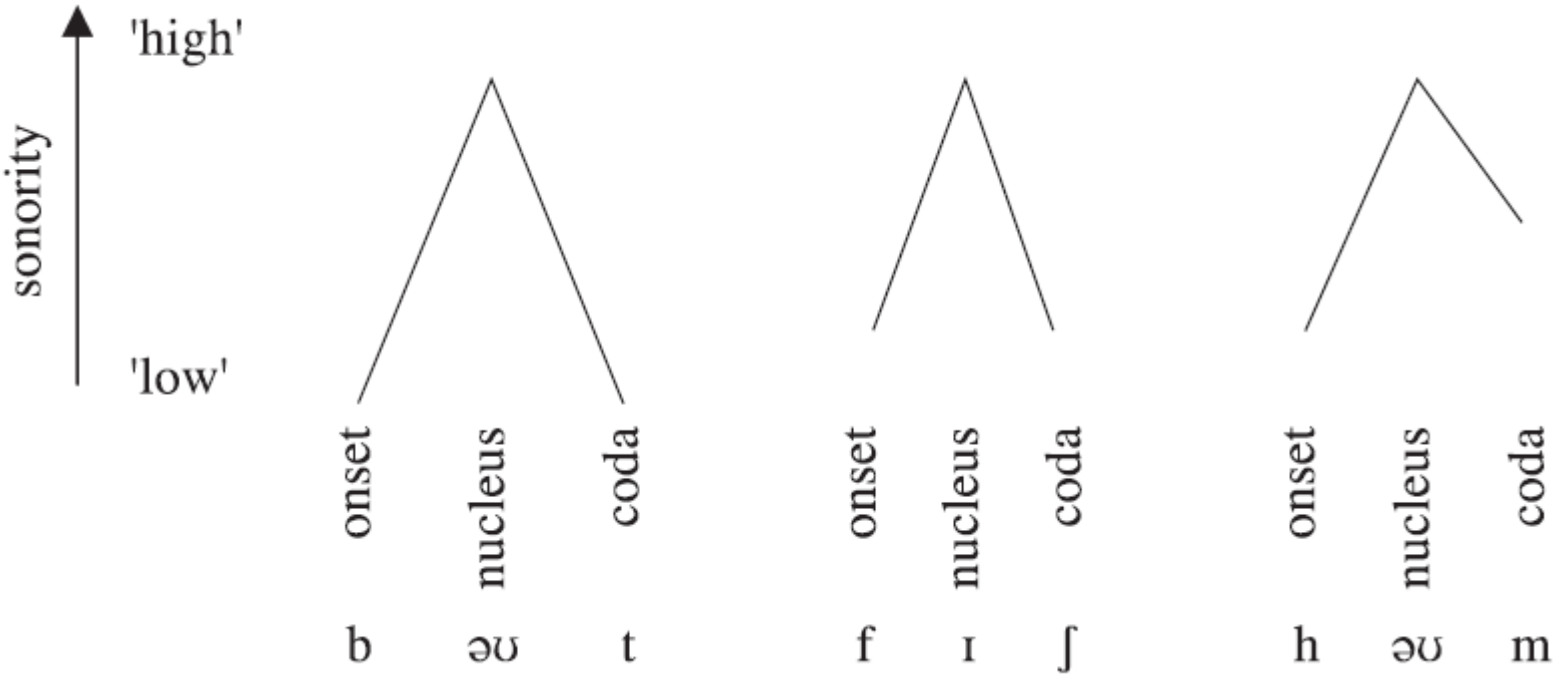
vowels > [w], [j] > [ɹ] > [l] > nasal consonants > fricatives, affricates > plosives

Alfred /æl.frəd/ l.frəd



Plag et al. (2009: 62)

Sonority scale



Plag et al. (2009: 61)

Syllables: phonotactics

PHONOTACTIC RESTRICTIONS in English:

- no combinations of /ps/ (/saɪˈkɒlədʒi/)and /kn/ in the onset position possible
- **no /ŋ/ in onset position in English**;
- **no word-final /h/ in English**
- **no word-final /w/**
- **no word-final /j/ in English**
- no combinations of /w, j/ with other consonants in the onset position
- no more than three initial consonants (in the onset position) (**CCC**V)
- initial three-consonant clusters all begin with /s/,

  e.g. /spl/ <*split*>, /str/ <*street*> or /skw/ <*square*>
- no more than four consonants in the coda

  e.g. /ksts/ <***texts***>, /gli**mpst**/ <glimsped>
- In general, longer consonant clusters are possible in the coda of a syllable than in the onset.
- Two types of syllables are distinguished: **OPEN SYLLABLES** end in a vowel, whereas **CLOSED SYLLABLES** end in a consonant.

(Kortmann 2005: 72; Bieswanger & Becker 2017: 65-66)

Syllabic consonants

- **[l], [n], [m]** and **[r]** can occupy the **NUCLEUS POSITION**
- in weak syllables without vowels

Syllabic /l/:

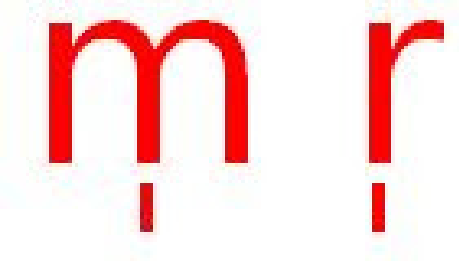
one or more consonants followed by „–le”

✓ <bottle> [ˈbɒtl̩]

✓ <cattle> [ˈkætl̩]

✓ couple [ˈkʌpl̩]

Syllabic n: in the word-medial and word-final positio



✓ <button> [ˈbʌtn̩]

✓ <happen> [ˈhæpn̩]

Syllabic /m/ and /ŋ/: in the process of assimilation

✓ < rhythm> [rɪð(ə)m̩]

✓ <cupboard> /kʌpbr̩d/ (rhotic dialects, e.g. AmE)

In syllables without vowels, consonants have to take over ‘vowel’ function

→ consonants that are most ‘vowel-like’ in quality (Roach 2009: 68-71).

References

Bieswanger, Markus & Annette Becker. 2017. *Introduction to English linguistics*. 3rd edition. Tübingen: Francke.

Crystal, David. 1995. *The Cambridge Encyclopaedia of the English Language*. Cambridge: Cambridge University Press.

English Language Club. 2020: Vowel Sounds: https://www.youtube.com/watch?v=72M770xTvaU, 12 November 2020

Kortmann, Bern. 2010. *Linguistics: Essential.* Berlin: Cornelsen.

Plag, Ingo, Maria Braun, Sabine Lappe & Marelie Schramm. 2009. *Introduction to Linguisitcs.* 2nd ed. Berlin: De GruyterMouton.

Roach, Peter. 2009. *English Phonetics and Phonology. A Practical Course*. 4th ed. Cambridge: Cambridge University Press.