Phonetics

Selected articles

First Year Students

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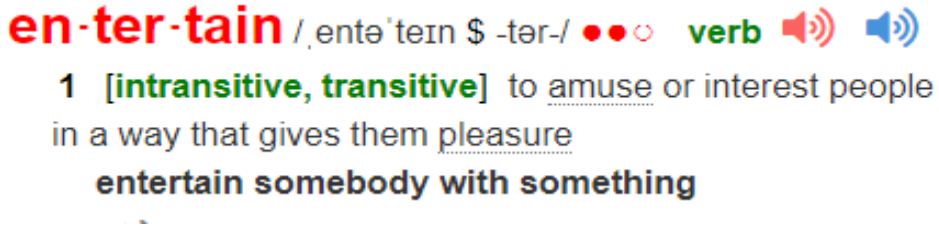
These materials were selected from online resources and articles

Chapter One

American vs. British English Transcription

The differences between American and British Englishes are not very important; both of them can understand them very well and communicate effectively. Many students and teachers and falsely justify the mistakes they make in pronunciation due to this difference. When you buy a dictionary, you should decide which one would you have. Do not worry about recognizing the differences since almost every dictionary has both American and British English transcriptions.

Dictionary Example ($ sign is American English):



The following table summarizes they key differences that may affect pronunciation and therefore transcription between the two accents.

THE LETTER R	British people only pronounce the letter R when it is followed by a vowel. American people pronounce this letter always	Compare teacher in AmE /ti:tʃˠr/ in BrE /ti:tʃˠ/
FINAL SCHWA / ə /	A final Schwa is pronounced very weak in	teacher /ti:tʃər/ in BrE it sounds similar

	both BrE and AmE, but if it happens at the end of speech (if after the schwa we pause or stop), then in BrE it often opens and becomes a sound very similar to / ʌ /, but in AmE it doesn't change.	to /tiːtʃʌ / (but in the phonetic transcription we still use an : /tiːtʃə/
The Vowel / ɒ/	In American English this vowel is more open than in BrE, so it sounds like the British vowel /ɑ/ (as in "father" or "car") but short.	similar to the vowel /ɔː/ (as in fork) .
The vowel /ʌ/ as in (hut)	n American English this vowel is more open than in BrE, so it sounds like the British vowel /ɑː/ (as in "father" or "car") but short	In British English this vowel sounds a little bit similar to the vowel /ɔː/ (as in fork)
The consonant T	n BrE this consonant sounds / t / in front of a vowel or between vowels. In American English it sounds / t / in front of a vowel, but it is flapped when it goes between vowels, like a quick / t	Peter in AmE / piːDᵊr/ In BrE /piːtᵊ/

	/ (we'll use the special symbol: / D /)	
Pronunciation of the letter U	In British English, the letter U sometimes Sounds **/ʌ/** (but, fun, must) and sometimes sounds / ju: / (tube, music, stupid).	stupid AmE /stju:pɪd/ BrE /stu:pɪd/
The Vowel / æ / as in (cat)	In BrE all the vowels can be classified as short (/æ / e/ɒ/ , etc) or long (/uː/ ɜː/ ɔː/ , etc.). In AmE they are all the same in length, or the difference is much smaller than in Britain. The difference is usually made with a contrast between tense and non-tense pronunciation rather than long and short.	

Activity

Transcribe the following according to British and American accents

The Word	AmE	BrE
Computer		
Matter		
Friend		
October		

Pertain		
Tomato		

Activity

Classify the following into American or British English transcription

Transcription	BrE	AmE
/daɪ.ˈvɝː.ʒən/		
/ˈbjuː.ti/		
/daɪ.ˈvɜːʃ.n̩/.		
/ˈbjuː.di/		

Activity

Find the mistake in the following transcriptions (there is only one mistake in each word):

1.	strength	[strɛngθ]	should be	[ ]
2.	crime	[craɪm]		[ ]
3.	wishing	[wɪshɪŋ]		[ ]
4.	wives	[waɪvs]		[ ]
5.	these	[θiz]		[ ]
6.	hijacking	[haɪjækɪŋ]		[ ]
7.	chipping	[tʃɪppɪŋ]		[ ]
8.	yelling	['yɛlɪŋ]		[ ]
9.	sixteen	['sɪxtin]		[ ]
10.	thesis	['ðisɪs]		[ ]

Now find the mistakes in the vowel transcription:

11. man-made	['manmeɪd]	should be	[ ]
12. football	['fʊtbol]		[ ]
13. tea chest	['titʃest]		[ ]
14. tomcat	['tomkæt]		[ ]
15. tiptoe	['tiptoʊ]		[ ]
16. avoid	[æ'vɔɪd]		[ ]
17. remain	[rə'man]		[ ]
18. bedroom	['bɛdrɔm]		[ ]
19. umbrella	[um'brɛlə]		[ ]
20. manage	['mænædʒ]		[ ]

Intro to Linguistics – Phonetics

Jirka Hana – October 9, 2011

Overview of topics

1. What is Phonetics
2. Subfields of Phonetics
3. Phonetic alphabet
4. Czech and English Speech Sounds
5. Narrow vs. Broad Transcription
6. Some Other Speech Sounds

1 What is Phonetics

Phonetics is the study of speech sounds:

- how they are produced,
- how they are perceived,
- what their physical properties are.

The technical word for a speech sound is **phone** (hence, *phone*tics). Cf. *telephone*, *headphone*, *phonograph*, *homophone*.

Place of phonetics in the language system:

Pragmatics	– Meaning in context
↑↓	
Semantics	– Literal meaning
↑↓	
Syntax	– Sentence structure
↑↓	
Morphology	– Word structure
↑↓	
Phonology	– Sound patterns, language dependent abstraction over sounds
↑↓	
Phonetics	– Sounds; (nearly) language independent

↑ – understanding language expressions; ↓ – producing language expressions

2 Subfields of Phonetics

Articulatory Phonetics – the study of the production of speech sounds.
The oldest form of phonetics.

> A typical observation: "The sound at the beginning of the word 'foot' is produced by bringing the lower lip into contact with the upper teeth and forcing air out of the mouth."

Auditory Phonetics – the study of the perception of speech sounds.
Related to neurology and cognitive science.

> A typical observation: "The sounds [s, ʃ, z, ʒ] are called sibilants because they share the property of sounding like a 'hiss'."

Acoustic Phonetics – the study of the physical properties of speech sounds.
A relatively new subfield (circa 50 years); uses sophisticated equipment (spectrograph, etc). Related to acoustics (the subfield of physics dealing with sound waves).

> A typical observation: "The strongest concentration of acoustic energy in the sound [s] is above 4000 Hz."

3 Phonetic Alphabet

Why do we need a new alphabet?
Because: We want to be able to write down how things are pronounced and the traditional Roman alphabet is not good enough for it:

- Words are pronounced differently depending on region, speaker, mood, ... but they are (usually) spelled the same way
  root [rut] or [rʊt], *truck* [trʌk] or [tʃrʌk], *strong* [strɔŋg] or [ʃtrɔŋg]
- Words or word forms sounding differently can be spelled the same way
  read [rid] vs. [rɛd]
- One sound is spelled many different ways:
  [k]: *king, card, clique, nick, chasm, exit*
  reed vs. *read*; *mě* 'I$_{gen/acc}$' vs. *mně* 'I$_{dat/loc}$', *tip* 'tip' vs. *typ* 'type'
- There are many more sounds than there are letters in Latin alphabet
  There are only 6 vowel letters, but English has at least 10 vowel sounds
  thigh, *thy*
  There are many other sounds in other languages

What we want is a simple system where every symbol would correspond to exactly one sound.
IPA (International Phonetic Alphabet) - a special alphabet for representing sounds was developed. See: `http://www.langsci.ucl.ac.uk/ipa/index.html`

4 Describing Czech and English sounds

Consonants vs Vowels

- consonants – involve some constriction (closure/narrowing) at some point in the vocal tract
- vowels – do not have constriction; can always be held indefinitely.

4.1 Describing Consonants

Three-part description of consonants:

- **Voicing** – do vocal folds vibrate?
  - **voiced** – vocal folds vibrate
    [b], [d], [ɡ] [m], [n], [ŋ], [z], [ʒ], etc.
  - **voiceless** – vocal folds are open and do no vibrate
    [p], [t], [k], [s], [ʃ], etc.
- **Manner of Articulation** – degree of the obstruction (narrowing, closure) & closure release type (sudden, slow), etc.
  - **Stops:** made by completely obstructing ("stopping") the flow of air
    [p/b, t/d, c/ɟ, k/ɡ, ʔ]

    [c]: *tisknout* 'print', *ťapka* [capka] 'paw', Greek: [ceri] 'candle'
    [ɟ]: *ďábel* [ɟaːbɛl] 'devil', *děda* [ɟɛda] 'grand-father'
    [ʔ] (glottal stop): *uh oh!* [ɔʔoʊ], *doopravit* [dɔʔɔp..] 'finish repairing'

    English voiceless stops are either aspirated (*pit* [p^{h}ɪt]) or nonaspirated (*spit* [spɪt])
  - **Fricatives:** made by forming a very narrow constriction and forcing air through, producing a hissing turbulent sound because of the friction between the air and the sides of the constriction.
    [f/v, θ/ð, s/z, ʃ/ʒ, x/ɣ, h/ɦ]

    [θ]: *th*ick, *th*igh
    [ð]: *th*en, *th*y
    [ʃ]: *sh*ip, *š*est 'six'
    [ʒ]: vi*s*ual, *ž*ába 'frog'
    [j]: *yes*
    [x]: *chleba* [xlɛba] 'bread'; German *Bach*
    [ɣ]: *abych byl* [abrɣbɪl]; Spanish *digno* 'worthy'
    [h] (voiceless) / [ɦ] (voiced)
    Czech glottal fricative is usually voiced, English usually voiceless.

- **Affricates:** stop immediately followed by a fricative.
  [t͡s / d͡z, t͡ʃ / d͡ʒ]

  [t͡s]: *c̲ihla* [t͡sɪfila] 'brick', German *Z̲ug* 'train' (≈ as *ts* in *cats*)
  [d͡z]: *le c̲kdo* [lɛd͡zgdɔ] 'various people'; sometimes in *Honza* [..nd͡za] x [..nza]
  [t͡ʃ]: *c̲hange*, *č̲eský* 'Czech';
  [d͡ʒ]: *j̲ournal*, *dž̲bán* 'pitcher'; sometimes in *manžel* [..nd͡ʒɛl] x [..nʒɛl] 'husband'

  Often written as [ʧ, ʤ, . . .] or simply as [tʃ, dʒ. . . .].
- **Trills**

  [r] (voiced alveolar trill): *krtek* 'mole'
  [r̝] (voiced raised alveolar trill): *dři* [dr̝ɪ] 'labour/sweat$_{imp}$'
  [r̝̥] (voiceless raised alveolar trill): *tři* [tr̝̥ɪ] 'three'
- **Nasals (nasal stops):** the velum is lowered, air passes also through the nose.
  [m, ɱ, n, ŋ, ɲ]

  [ɱ]: sometimes in *comfort* [kʌɱfərt] x [..mf..], *tramvaj* [..ɱv..] x [..mv..]'tram'
  [ŋ]: *walkin̲g* [..kɪŋ] (some dialects [..kɪm])
  [ɲ]: *nic* [ɲɪts] 'nothing'; Spanish *caña* [kaɲa] 'cane' (≈ *n* in *annual*)
- **Liquids:** narrow passage, but not narrow enough to cause friction (a la fricatives).
  [l, ɹ, ɾ]
  [ɾ] (flap): *vi̲tamin* in U.S. English (≈ short [d]), some *r*'s in Czech
- **Glides:** almost a vowel, but slightly more constricted. The least constricted type of consonant.
  [j, w]

  Since liquids and nasals are produced with a relatively open passage of air flow, they can be *syllabic*: *bird* [bɹ̩d] (U.S.), *simple* [sɪmpl̩], *reason* [rizn̩]; *vlk* [vl̩k] 'wolf', *krk* [kr̩k] 'neck'

- **Place of Articulation** – where the main obstruction is made (lips, teeth, velum, etc.)
  - **Bilabial** (bi – two, labium – lip): the lips are close together or touching.
    [p/b, m, w]
  - **Labiodental** (dental – teeth): the lower lip up is against the upper front teeth.
    [f/v]
  - **Interdental** (inter – between): the tip of the tongue is between the front teeth
    [θ/ð]
  - **Alveolar:** the tip of the tongue is at the alveolar ridge (the ridge just behind the teeth)
    [t/d, s/z, n, l, r, ɹ, ɾ]
  - **Palatal:** the tongue is near the hard palate (hard part of the roof of the mouth).
    [ʃ/ʒ; j; tʃ/dʒ]
  - **Velar:** the tongue approaches the velum (soft part of the roof of the mouth)
    [k/g, ŋ]
  - **Glottal:** the glottis is the point of constriction.
    [h/ɦ; ʔ]

4.2 Describing Vowels

Vowels are produced with a mostly open oral tract, so place/manner of articulation (a la consonants) is not useful in describing them.

4.2.1 English Vowels

In English, all vowels are usually *voiced*.

- **Tongue height:** high = near the roof of mouth

  Opening of mouth coincides more or less with tongue height.

  - **High:** [i, ɪ, u, ʊ] *leak, lick, luke, look*
  - **Mid:** [e, ɛ, ə, ʌ, ɔ, o] *bait, bet, sofa, but, bought, boat*
  - **Low:** [æ, a] *cat, cot*

- **Tongue advancement:** tongue further forward or back in mouth

  - **Front:** [i, ɪ, e, ɛ, æ] *seek, sick, sake, sec, sack*
  - **Back:** [u, ʊ, o, ɔ, a] *ooze, look, road, paw, dot*
  - **Central:** [ə, ʌ] *sofa, but*

- **Lip rounding:**

  - **rounded:** [u, ʊ, o, ɔ] *food, put, road, caught*
  - **unrounded:** the rest

- **Tenseness:** tongue position of the lax vowels are less extreme.

  - **Tense** – [i] (*deed*), [u] (*loose*)
  - **Lax** – [ɪ] (*did*), [ʊ] (*put*)

  Tense vowels are longer than their lax counterparts – *deed* vs. *did*.

diphthong – a complex sound consisting of two vowel sounds.
[aɪ] (*r*i*ght*), [oɪ] (*b*oy*), [eɪ] (*th*ey*), [aʊ] (*l*au*d*), [oʊ] – (*g*o*)

Note: English [e] occurs only in [eɪ] and [o] only in [oʊ]. Therefore the glide is often omitted in simplified transcriptions, because you know it is always there.

4.2.2 Czech Vowels

short: [ɪ, ɛ, a, ʊ, ɔ]
long: [iː, ɛː, aː, uː] and borrowed [ɔː]
diphtongs: [aʊ] and borrowed [oʊ], [ɛʊ]

5 Some Other Speech Sounds

5.1 Vowels

Rounded Vowels

The only rounded vowels in Czech/English are the back vowels [u, ʊ, o, ɔ].

German and French both have front rounded vowels. They are written as [y] and [œ] in IPA. The high front rounded vowel [y] is pronounced like [i], but with rounded lips.

	Front rounded		Back rounded		Front unrounded	
French:	[sy]	sue (*I sweat*)	[su]	sous (*under*)	[si]	si (*if/yes*)
	[nø]	noed (*knot*)	[no]	nos (*our*)	[ne]	né (born)

Nasalized Vowels

- Oral vowels – more common; the nasal passage is closed (the velum is raised).
- Nasal vowel – like oral, but the nasal passage is open; marked by a tilde ([ẽ, ã, . . .]).

	Oral		Nasal	
	[mɛ]	*mais* (but)	[mɛ̃]	*main* (hand)
French:	[lɛ]	*lait* (milk)	[lɛ̃]	*line* (linen)
	[ʃas]	*chasse* (hunt)	[sãs]	*chance* (luck)
	[mo]	*mot* (word)	[mõ]	*mon* (my)

In fact, there are nasal vowels in Czech and English – before nasal consonants, e.g. in *bin* [bĩn]. However, because they do not distinguish meaning (as they do in French), in a simplified transcription, their nasality is usually ignored ([bɪn]).

5.2 Consonants

- voiceless uvular stop [q]: Farsi (Persian, Iran)
- voiced bilabial fricative [β]: Spanish *Cuba*
- voiceless labial affricate [pf]: German *Pfennig* (penny)
- non-pulmonic consonants – sounds whose airflow is not dependent on the lungs:
  - clicks – in Khoisan languages and some Bantu languages in Africa
  - implosives
  - ejectives – in many native American languages and Caucasian languages

6 Narrow vs. Broad Transcription

Depending on the purpose of the transcription, we are either more detailed (the so called narrow transcription) or less (broad transcription). Usually we omit details that can be obtained by using simple and regular rules (e.g. all English word initial voiceless stops are aspirated).

In a really narrow transcription of English we have to capture all of the following (and much more). We ignore it in broad transcriptions:

- **Aspiration:** *pat* [pʰæt] vs. *spat* [spæt]

  All English word initial voiceless stops are aspirated ([pʰ, tʰ, kʰ])

- **Flaps:** *put* [pʊt] vs. *putting* [pʊɾɪŋ], *ladder* [lærər] = *latter* [lærər]

  In American English, /t/ and /d/ are pronounced as [ɾ] between two vowels, where the first one is stressed.

- **Lengthened vowels:** *hat* [hæt] vs. *had* [hæːd], *beat* [bit] vs. *bead* [biːd]

  Vowels are slightly longer before voiced consonants.

- **Assimilations** – sounds tend to become similar to their neighbors:

  - *input* often as *imput* [ɪmpʊt], *lean bacon* often as *leam bacon* [lim beɪkn̩]
  - **Nasalized vowels**: *bit* [bɪt] vs. *bin* [bĩn]
    vowels are nasalized before nasals ([n, m, ŋ]).
  - **Labiodental nasal**: [ɱ] in *comfort* [kʌɱfərt]
    /m/ is pronounced as [ɱ] before labiodentals ([f, v]).

- **Deletions**: some sounds are omitted, esp. in fast speech and word-final consonants.

  past as *pas*, *lost shoe* [last ʃu] as *losh shoe* [laʃ ʃu] ([t] omitted, [s] assimilated to [ʃ])

- etc.

7 Links

- IPA (charts, sounds)

  `http://www.langsci.ucl.ac.uk/ipa/index.html`

- Customizable vocal tract showing the corresponding IPA symbol

  `http://www.chass.utoronto.ca/~danhall/phonetics/sammy.html`

- Interactive IPA charts linking each symbol to its pronuntiation (note that consonants are surrounded by vowels)

  `http://www.yorku.ca/earmstro/ipa/index.html`

- List of various online phonetic resources:

  `http://www.unc.edu/~jlsmith/pht-url.html`

4 Phonetics and Phonology

KEY CONCEPTS
Articulatory phonetics, phonetic symbols
Consonants, approximants, vowels
Syllables, feet
Phonology, phonemes, allophones, phonological rules

INTRODUCTION

In this chapter we sketch the pronunciation system of English. We begin with **phonetics**, a system for describing and recording the sounds of language objectively. Phonetics provides a valuable way of opening our ears to facets of language that we tend to understand by reference to their written rather than their actual spoken forms. **Phonology** concerns itself with the ways in which languages make use of sounds to distinguish words from each other.

Teachers should be knowledgeable about the phonetics and phonology of English because (1) the sound system is primary and the basis for the spelling system; (2) they may have to teach English pronunciation to students who are not native speakers of English; (3) they may have to teach poetry, which requires that they teach about rhyme, alliteration, assonance, and other poetic devices that manipulate sound; (4) it is important to understand accents and language variation and to react appropriately to them and to teach appropriate language attitudes about them to students (see our chapters on Language and Society and Usage in Book II); (5) we are so literate that we tend to "hear" the sounds of our language through its spelling system, and phonetics/phonology provides a corrective to that; and (6) phonetics and phonology provide systematic and well-founded understandings of the sound patterns of English.

ARTICULATORY PHONETICS

We have three goals in this section. First, we introduce you to the ways in which the sounds of English are produced. Second, we develop a system for classifying speech sounds on the basis of how they are produced. Simultaneously we introduce an alphabet approximating that developed by the International Phonetics Association (IPA), which will allow us to refer to sounds quite precisely. When we want to indicate that letters are to be interpreted as phonetic symbols, we enclose them in square brackets, [ ], and when we want to indicate that letters are to be interpreted as letters from an ordinary spelling system, we enclose them in angled brackets, < >.

The phonetic alphabet uses many of the letters of the English alphabet, but their pronunciations are very restricted and are not always the ones you might expect. In this system, there are no "silent" letters—every phonetic symbol represents an actual sound. Every letter always has the same pronunciation regardless of its context, no letter has more than one pronunciation, and no sounds are represented by more than one letter. To make fine distinctions, phoneticians add special symbols, called **diacritics**, to the basic letters. For some English sounds and for languages other than English, symbols not from the English alphabet have been devised. (You might visit the IPA web site for a full listing of the symbols.)

In the sections to follow, we describe the sounds represented by these symbols and how these sounds are made. As we go through these sections, pay attention to the ways in which individual sounds are ordinarily spelled in English, as well as to the phonetic spellings.

To produce speech, air must flow from the **lungs** through the **vocal tract**, which includes the **vocal folds** (popularly called the vocal cords, though they are more like thick elastic bands than strings), the nose or **nasal cavity**, and the mouth or **oral cavity** (See Figure 1). The vocal folds vibrate for some sounds but not for others. Air flows through the nose for certain sounds but not others. But the main creator of speech sounds is the mouth. We will describe the roles that each of these elements plays in the following paragraphs.

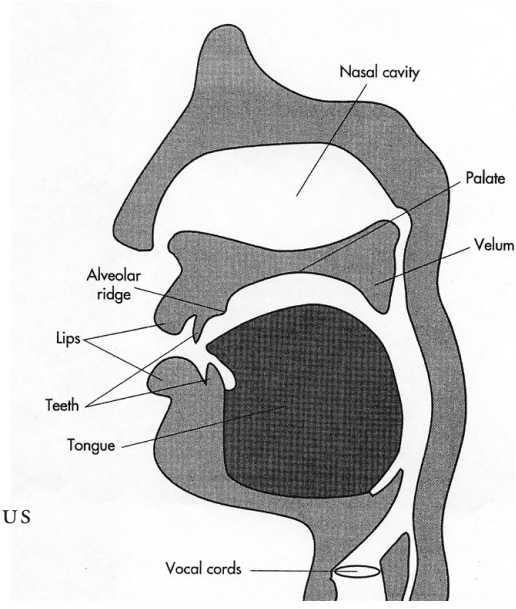


FIGURE 1: VOCAL APPARATUS

CONSONANTS

Consonants include the sounds we represent as <p, b, t, d, m, n, f, v, s, z, l, r, h> in the ordinary alphabet. All **consonants** are produced by entirely or almost entirely stopping the airstream coming from the lungs. When we almost entirely stop the airstream we force it through such a narrow opening that the airflow at that point is turbulent and noisy.

We classify consonants according to the following characteristics: (a) whether or not the vocal folds are vibrating (**voicing**); (b) whether the sound is made with a fully stopped or merely constricted airstream (its **manner of articulation**); (c) where in the mouth the stoppage or constriction is made (its **place of articulation**); (d) whether or not air is flowing through the nasal cavity (**nasality**); and (e) whether or not the lips are pursed (**lip-rounding**).

Voicing

As a warm-up exercise, make the sound fffff, and keep it going for a count of five. Now make the sound vvvvv, and keep it going for a count of five. Now alternate these two: fffffvvvvvfffffvvvvv. You probably noticed that vvvvv had a "buzz" that fffff did not have. That "buzz" is caused by the vibrating of your vocal folds—which you can check by putting your fingers on your throat or by covering your ears as you alternate fffff and vvvvv. Now try the same exercises with the first sounds of the following words: *thigh*, *thy*; *sip*, *zip*. You should be able to feel the vocal folds vibrate as you make the second sound of each pair.

Sounds produced with vibrating vocal folds (see Figure 1) are said to be **voiced**; those produced without vocal cord vibration are **voiceless**. Table 1 lists the voiced and voiceless consonants of English. The letters in [ ] are the phonetic symbols for the sounds.

VOICED	VOICELESS
by [b]	**p**ie [p]
my [m]	
wet [w]	
vie [v]	**f**ie [f]
thy [ð]	**th**igh [θ]
die [d]	**t**ie [t]
nigh [n]	
zip [z]	**s**ip [s]
lie [l]	
rye [r]	

bei**ge** [ʒ]	ba**sh** [ʃ]
jive [dʒ]	**ch**ive [tʃ]
yet [j]	
guide [g]	**k**ite [k]
go**ng** [ŋ]	
	hive [h]

TABLE 1: VOICED AND VOICELESS CONSONANTS

Exercise

1. Collect a set of words in which each of the voiced and voiceless sounds listed in the two columns above occurs as the first sound of a word, in the middle of a word (specifically between two vowels), and at the end of a word, as in: [b] ***b**ird, rub**b**ing, rub;* [p] ***p**an, tap**p**ing, tap**.** How are each of these sounds ordinarily spelled? (Note: English single and double consonants, as in *rub* and *rubbing*, *tap* and *tapping*, represent the same sound. The doubled consonants tell us how the vowel before them is to be pronounced; cf. *tapping, taping*.)

2. Identify the sound represented by each of the following phonetic symbols and for each sound collect five words in which it occurs: [p, b, f, v, θ, ð, ʃ, ʒ, tʃ, dʒ, s, z]. How is each of these sounds ordinarily spelled?

Nasality

Make the sound represented by <m> in the word *Pam* and continue it for some seconds. As you continue it, pinch your nose and observe what happens to the sound. It should stop immediately. This shows that air was flowing through your nose as you produced this sound. Now try the same little experiment with the <n> of *pan* and the <ng> of *pang*. You should find that the air flows through the nose in these two cases also. Sounds in which air flows through the nose are called **nasal** sounds. The air is allowed into the nose by lowering the **velum**, the soft palate at the back of the mouth (see Figure 1). English has three main nasal sounds:

[m]	Pa**m**	cla**mm**y	**m**at
[n]	pa**n**	cla**nn**ish	**N**at
[ŋ]	pa**ng**	cli**ng**y	----

Exercise

Using the data just above, say where [ŋ] **cannot** occur in a word. How are each of these nasal sounds ordinarily spelled?

Manner of articulation

By **manner of articulation** we mean the kind of closure or constriction used in making the sound. We classify English consonants according to three manners of articulation: **stops** (full stoppage of the airstream somewhere in the *oral* cavity between the vocal folds and the lips, as in [p], [b], [m]); **fricatives** (constriction of the airstream in the oral cavity producing turbulence and noise, as in [f], [v]); **affricates** (full stoppage of the airstream followed immediately by constriction, as in [tʃ], [dʒ]). Table 2 summarizes the different manners of articulation.

Stops

[p]	**p**ad	[b]	**b**ad	[m]	**m**at
[t]	**t**ad	[d]	**d**a**d**	[n]	**N**at
[k]	**c**ad	[g]	**g**ad	[ŋ]	ta**ng**

Fricatives

[f]	**f**ie	[v]	**v**ie
[θ]	**th**igh	[ð]	**th**y
[s]	**S**ue	[z]	**z**oo
[ʃ]	**sh**oe	[ʒ]	**j**us (au jus)
[h]	**h**ow		

Affricates

[tʃ]	**ch**in
[dʒ]	**g**in

TABLE 2: MANNERS OF ARTICULATION

Exercise

For each of the sounds listed in Table 2, collect five words in which the sound occurs as the last sound of the word and another five in which the sound occurs in the middle of the word (specifically, between two

vowels), as [ŋ] is in *ring, ringing*. How is each sound ordinarily spelled?

Place of articulation

By **place of articulation** we mean the area in the mouth at which the consonantal closure or constriction occurs. English uses only seven places of articulation (see Figure 1) which we describe and illustrate below.

Bilabial sounds are made by bringing both lips together to stop the airstream:

[p]	**p**ie	cu**pp**ing	cu**p**
[b]	**b**y	clu**bb**ing	cu**b**
[m]	**m**y	co**m**ing	co**m**e

Labiodental sounds are made by bringing the top teeth into contact with the bottom lip and forcing air between the two to create the fricatives:

[f]	**f**eel	ra**ff**le	tou**gh**
[v]	**v**eal	ra**v**el	do**v**e

Interdental sounds are made by placing the tip of the tongue between the top and bottom teeth and forcing air through. Again, these are both fricatives:

[θ]	**th**igh	e**th**er	mou**th**	ba**th** (noun)
[ð]	**th**y	ei**th**er	mou**th**	ba**the** (verb)

Alveolar sounds are made by bringing the tongue and the alveolar ridge (the bony ridge just behind the top teeth) together to create either a stop or fricative:

[t]	**t**ub	boa**t**ing	boa**t**	[s]	**s**ip	fu**ss**y	gra**ce**
[d]	**d**ub	bo**d**ing	bo**d**e	[z]	**z**ip	fu**zz**y	gra**z**e
[n]	**kn**it	bo**n**ing	bo**n**e	[r]	**r**ip	te**rr**or	tea**r**

(Alveo-)palatal sounds are made by bringing the blade of the tongue to, or close to, the alveo-palatal area of the roof of the mouth to create fricatives and affricates:

[ʃ]	**s**ure	vi**ci**ous	ru**sh**
[ʒ]	**g**enre	vi**si**on	rou**ge**
[tʃ]	**ch**in	ca**tch**er	e**tch**
[dʒ]	**g**in	e**dge**r	e**dge**

Velar sounds are created by stopping the airstream by bringing the back of the tongue into contact with the velum:

[k]	**c**ould	ba**ck**er	tu**ck**
[g]	**g**ood	ba**gg**er	tu**g**
[ŋ]	------	ba**ng**er	to**ng**ue

Glottal sounds are created by either narrowing the vocal folds sufficiently to create a fricative or closing them to create a stop:

[h] **h**at ca**h**oots [ʔ] bu**tt**er (some varieties of English)

Exercise

For each of the sounds listed under Place of Articulation, find five words in which the sound occurs. How are each of these sounds ordinarily spelled?

Approximants

Approximants are sounds made by narrowing the oral cavity but not enough to cause turbulence in the airstream; the airstream is said to be smooth. The beginning sounds of *lye* and *rye* are approximants. The narrowest point in the airstream is wider in approximants than in fricatives, but is not as wide as it is in vowels. Approximants are more **sonorant** (**resonant**, i.e., naturally loud) than consonants, but less so than vowels. They are like consonants in that they typically occur before or after the vowels of syllables (see below). English has three kinds of approximants.

Lateral approximants are made by touching the tongue to the alveolar ridge while allowing the air to pass along one or both sides, as in [l]—in *lack*, *call*, and *callow*.

Central approximants are made by raising the sides of the tongue so that the air flows along the center of the tongue, as in [r]—in *rock*, *roll*, and *Rory*. [r] is regarded as an alveolar sound.

Glides (**semivowels**) come in two kinds: palatal and labio-velar. **Palatal**

glides are made by raising the tongue toward the hard palate, close to where the vowel in *eat* is made. The first sound of *yet*, *yolk*, and *y'all* is a palatal glide, represented phonetically as [j]. **Labio-velar** glides are made by rounding the lips and simultaneously raising the back of the tongue toward the velum, close to where the vowel sound of *ooze* is made. Labio-velar glides thus have two places of articulation—they are both labial and velar. The first sound of *wet*, *wall*, and *wink* is a labio-velar glide, represented phonetically as [w].

Lateral	[l]	**l**et	
Central	[r]	**Rh**ett	
Glides	Labio-velar	[w]	**w**et
	Palatal	[j]	**y**et

Articulatory descriptions

An **articulatory description** of any consonant or approximant must specify (at least) its place and manner of articulation, whether it is voiced or voiceless, and whether it is nasal or oral. For example, [m] is made at the lips by stopping the airstream, is voiced, and is nasal. These features are represented as:

	[m]	[w]	[l]
Voicing	voiced	voiced	voiced
Place	bilabial	labio-velar	alveolar
Manner	stop	glide	lateral approximant
Nasality	nasal	oral	oral
Example word	**mime**	**wow**	**low**

We can gather all of the consonants that we have described into a single chart:

	bilabial	labio-dental	inter-dental	alveolar	(alveo-)palatal	velar	glottal
stop	p b			t d		k g	(ʔ)
nasal stop	m			n		ŋ	
fricative		f v	θ ð	s z	ʃ ʒ		h
affricate					tʃ dʒ		
approximants							
glides	(w)				j	(w)	
lateral				l			
central				r			

TABLE 3: ENGLISH CONSONANTS AND APPROXIMANTS

Exercise

You should now be able to provide an articulator description for each of the following sounds. Consult Tables 1-3.

	[t]	[k]	[b]	[d]	[g]
Voicing					
Place					
Manner					
Nasality					
Example word					

	[n]	[ŋ]	[f]	[v]	[θ]
Voicing					
Place					
Manner					
Nasality					
Example word					

	[ð]	[s]	[z]	[ʃ]	[ʒ]
Voicing					
Place					
Manner					
Nasality					
Example word					

	[tʃ]	[dʒ]	[l]	[r]	[h]
Voicing					
Place					
Manner					
Nasality					
Example word					

	[w]	[j]
Voicing		
Place		
Manner		
Nasality		
Example word		

VOWELS

Vowels include the sounds we ordinarily represent as the letters <a, e, i, o, u>, as well as a number of other sounds for which the ordinary alphabet has no unique symbols.

Vowels are distinguished from consonants in several ways. As we have seen, consonants are produced by constricting the airstream to various degrees as it flows through the oral tract. **Vowels** are produced with a smooth, unobstructed airflow through the oral tract.

Differences in vowel quality are produced by different shapes of the oral cavity. Characteristic vowel qualities are determined by (a) the height of the tongue in the mouth; (b) the part of the tongue raised (front, middle, or back); (c) the configuration of the lips; and (d) the tension of the muscles of the oral tract. An articulatory description of a vowel must include all of these features.

Tongue height

Pronounce the words *eat* and *at*. Now pronounce just the vowels of these two words. Notice that as you go from the vowel of *eat* to the vowel of *at*, your mouth opens. If this is not obvious to you just by playing with these two vowels, look in a mirror as you produce them. Alternate the words, and then just the two vowels.

Once you've become accustomed to the different degrees of openness of these two vowels, pronounce *ate* between *eat* and *at*. The degree of openness of its vowel falls between those of *eat* and *at*, so there is a continuous increase in mouth openness as you go from one vowel to another. These degrees distinguish **high**, **mid**, and **low** vowels. We will use the following symbols for this sequence of vowels:

(1)	**ea**t	[i]	High
	at**e**	[e]	Mid
	at	[æ]	Low

Exercise

For each of the three vowels above, find five words in which the vowel occurs. Be clear about which symbol most accurately applies to each vowel. How is each of these vowels ordinarily spelled?

Front and back vowels

Now compare the vowel of *beat* with that of *boot*. Alternate the words, and then just the vowels. It will be more difficult this time to monitor the activities of your tongue as you shift from one of these to the other, but try anyway.

You produce the [i] of *beat* with the front (blade) of your tongue raised toward your palate. If you draw in your breath as you make this vowel, you will feel the cold air against your palate. As you shift from [i] to [u], the vowel of *boot*, you will find yourself raising the back of your tongue. (You will also find yourself pursing (**rounding**) your lips, but disregard this for the moment.) Because of the relative positions at which these vowels are made in the mouth, phoneticians call [i] and the other vowels in (1) **front vowels**, and [u] a **back vowel**.

The back vowels, like the front ones, descend from high, through mid, to low, in a continuous sequence. You can observe this by pronouncing the words *coot*, *coat*, and *cot*, and then just their vowels. As you produce this series of vowels you'll find your mouth opening (monitor your lower jaw) as you go from *coot* to *coat* to *cot*. We use the following symbols for these back vowels:

(2)	c**oo**t	[u]	High
	c**oa**t	[o]	Mid
	c**o**t	[ɑ]	Low

Exercise

For each of the three vowels just above, find five words in which the vowel occurs. Be clear about which symbol most accurately applies to each vowel. How is each of these vowels ordinarily spelled?

We combine these two series of vowels in Table 4:

	FRONT		BACK
HIGH	i		u
MID	e		o
LOW		æ	ɑ

TABLE 4: FRONT AND BACK VOWELS

Exercise

For each of the vowels in Table 4, find five more words in which the vowel occurs. Be clear about which symbol most accurately applies to each vowel. How is each of these vowels ordinarily spelled?

Lip rounding

As you compared [i] and [u] you probably noticed that your lips changed shape as you shifted from the front vowel to the back one. Your lips were **rounded** as you produced [u]. They were **unrounded** (**spread** or **neutral**) as you produced [i]. As you moved through the series of back vowels you may also have noticed that lip rounding decreased as you moved from high to low. In fact the lips are unrounded during the pronunciation of [ɑ]. In English, the only rounded vowels are back, though many languages, such as French and German, have rounded front vowels.

Exercise

Find five pairs of words to illustrate lip rounding. The first member of each pair of words must include a rounded vowel; the second member should be as similar as possible to the first, but must include a corresponding vowel that is not rounded. Assign a phonetic symbol to each vowel, e.g., *heat* [i], *hoot* [u]. As always, note how each vowel is ordinarily spelled.

Intermediate vowels

First, pronounce the words *meat*, *mitt*, *mate*, *met*, and *mat*. Then pronounce just their vowels:

m**ea**t	m**e**	[i]
m**i**tt		[ɪ]
m**a**t**e**	m**ay**	[e]
m**e**t		[ɛ]
m**a**t		[æ]

The vowels we've just added, [ɪ] and [ɛ], are intermediate in height between [i] and [e], and [e] and [æ], respectively.

Exercise

For each of the vowels we've just discussed, find 5 more words in which they occur. Note how they are ordinarily spelled.

Now pronounce the series of words *suit*, *soot*, *sowed*, *sought*, *sot*. Then pronounce just their vowels:

s**ui**t	c**ooe**d	fl**ew**	[u]
s**oo**t	c**oul**d		[ʊ]
s**owe**d	c**o**d**e**	fl**ow**	[o]
s**ough**t	fr**augh**t	c**aw**	[ɔ]
s**o**t	c**o**t	sp**a**	[ɑ]

We've added two more intermediate vowels to the back series, [ʊ] and [ɔ].

Exercise

For each of the vowels we've just discussed, find 5 more words in which they occur. Note how they are ordinarily spelled.

Now say the following words, paying attention to their vowels, and especially to the movement of your tongue as you go from one vowel to the next: *ate*, *up*, *oat*. The vowel in *ate* is [e] and that in *oat* is [o]. The vowel in *up* is represented by [ʌ], called "wedge" or "caret."

We hope that you noticed your tongue pull back as you went from [e] to [ʌ], and back farther as you went from [ʌ] to [o]. [e] is a mid, front vowel, and [o] is a mid back vowel. As [ʌ] is between these two and at about the same height, it is a mid central vowel.

We've now added five intermediate vowels: [ɪ] as in *mitt*, *hid*, *rip*; [ɛ] as in *wept*, *bed*, *flex*; [ʊ] as in *hood*, *could*; [ɔ] as in *caw*; and [ʌ] as in *mutt*. Of these, [ɪ] and [ɛ] are front and unrounded, while [ʊ] and [ɔ] are back and rounded, and [ʌ] is central and unrounded. These new vowels differ from the ones we introduced earlier in several ways:

1. In length: [i], [e], [u], [o], [ɔ], and [ɑ] are longer than [ɪ], [ɛ], [æ], [ʊ], and [ʌ], when they occur in the same contexts.
2. In position in the mouth: [i] and [e] are higher and farther front than [ɪ] and [ɛ], respectively; [u] and [o] are higher and farther back than [ʊ] and [ɔ], respectively.

3. All vowels can occur in syllables (see below) that end in at least one consonant (**closed** syllables); [i], [e], [u], [o], [ɔ], and [ɑ] can occur as the final sound in a syllable (**open** syllables).
4. Muscle tension: [i], [e], [u], [o], [ɔ], and [ɑ] are produced with greater muscle tension in the articulators than [ɪ], [ɛ], [æ], [ʊ], and [ʌ] are. The former are **tense** vowels; the latter are **lax**. The greater tension in [i], [e], [u], [o], [ɔ], and [ɑ] may explain why they are longer and more peripheral, i.e., closer to the boundary of the mouth, than the other vowels.

Even though there are several differences separating these two sets of vowels, we will refer to them as **tense** and **lax** vowels. Table 5 lists all of them:

	TENSE		LAX
b**ea**t, b**ee**	[i]	h**i**t	[ɪ]
b**oo**t, b**oo**	[u]	h**oo**d	[ʊ]
b**ai**t, b**ay**	[e]	h**ea**d	[ɛ]
b**oa**t, b**eau**	[o]	h**a**t	[æ]
b**ough**t, p**aw**	[ɔ]	h**u**t	[ʌ]
p**o**t, sp**a**	[ɑ]		

TABLE 5: TENSE AND LAX VOWELS

You may have noticed that all of the example words we have used to exemplify the vowels we have distinguished consist of a single syllable. This is because vowels in multi-syllabic words can differ from those in monosyllables, and we wanted to compare vowels in similar contexts. We have now distinguished the following vowels:

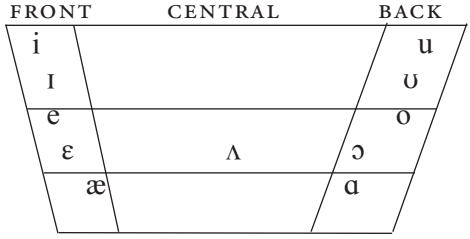


TABLE 6: ENGLISH VOWELS IN MONOSYLLABIC WORDS

Not all American English speakers distinguish [ɔ] and [ɑ] in all contexts.

In some dialects of American English (California, Midwest), the vowels [ɔ] and [ɑ] in pairs of words such as *sought* and *sot*, *caught* and *cot*, and *wrought* and *rot* are pronounced identically, though the vowel used is neither [ɔ] nor [ɑ], but one intermediate between them.

Vowels in multi-syllabic words

Pronounce the words ***a**bove*, *soda*, *sofa*, *comma*, *arena*, *patina*, *photograph*, paying particular attention to the vowel represented by the bold letters. Then pronounce this vowel in isolation. This vowel is called **schwa** and written [ə]. Schwa is made at approximately the same place as [ʌ], that is, farther forward than the back vowels and farther back than the front ones. Hence, it is central. In addition, [ə] is mid, lax, and unrounded. It is heard primarily in unstressed syllables, as in the words above. It is the vowel we produce if we vocalize as we prepare to speak—*uh*. The tongue is said to be in its neutral position as we pronounce this vowel.

Exercise

Find five words to illustrate the vowel [ə]. Can you estimate how common this vowel is in English? What letters of the alphabet ordinarily indicate this sound?

We can present the vowels as we presented the consonants, on a chart indicating their articulatory properties.

	FRONT	CENTRAL	BACK	
	Unrounded			Rounded
Upper high	i			u
Lower high	ɪ			ʊ
Upper mid	e	ə		o
Lower mid	ɛ	ʌ		ɔ
Low	æ		ɑ	

TABLE 7: ENGLISH VOWELS

Exercise

1. Find five words to illustrate each of the vowels we distinguish in Table 7. Be clear about which symbol most accurately applies to each vowel.

2. Provide an articulatory description for each of the following vowels; that is, indicate its height, position (front or back), tension, and lip configuration.

	[ɪ]	[e]	[u]	[ʊ]	[ɛ]	[ʌ]
Height						
Position						
Tension						
Rounding						
Example word						
	[ɑ]	[æ]	[o]	[i]	[ə]	[ɔ]
Height						
Position						
Tension						
Rounding						
Example word						

Diphthongs

We have approached vowels as if they were articulated by a specific configuration of the tongue, lips, and oral cavity, which is held constant throughout their pronunciation. Vowels made like this are called **monophthongs**; others, called **diphthongs**, involve a change in the configuration of the mouth.

The vowel sounds in the words *boy*, *by*, and *how* involve a change in the shape of the mouth as the vowel is being produced. The vowel of *boy* begins with approximately the mid back vowel [ɔ] and finishes with approximately the high front lax vowel [ɪ] (or the palatal glide [j]). The vowel of *by* begins with approximately the low back vowel [a] (a low back vowel slightly more forward than [ɑ], but not as forward as [æ]) and also finishes with approximately [ɪ] (or [j]). The vowel of *how* begins with approximately [a] and finishes with approximately the high lax rounded vowel [ʊ] (or the labio-velar glide [w]). We represent these diphthongs as [ɔɪ], [aɪ], and [aʊ], respectively (though many linguists use [ɔj], [aj], and [aw]).

Exercise

1. For each of the three diphthongs symbolized below provide four more example words. In two of these words the diphthong should appear in a closed syllable (i.e., before a consonant, e.g., *Boyd*) and in the other two words it should appear in an open syllable (i.e., not followed by a consonant, e.g., *boy*).

[ɔɪ] _____ _____ _____ _____
[aɪ] _____ _____ _____ _____
[aʊ] _____ _____ _____ _____

2. Are the English diphthongs tense or lax? (Hint: they can occur in open syllables.)

A second set of English diphthongs is not as clearly distinguished as the first, primarily because we tend to perceive them as simple vowels. However, in a precise (**narrow**) phonetic transcription they must be represented as diphthongs. The tense front vowel [e] is diphthongized. If you listen carefully you will notice that the vowel of *bate* is actually pronounced [eɪ]. The tense back vowel [o] is also diphthongized: if you listen carefully you will notice that the vowel of *boat* is actually pronounced [oʊ]. So, the front tense vowel is diphthongized by the addition of a front vowel and the back tense vowel is diphthongized by the addition of a back vowel. We can express this pattern as a rule: *Mid and high tense vowels are diphthongized by the addition of a high lax vowel that matches the original vowel in frontness or backness.*

Diphthongization of these vowels is a feature of English rather than a universal feature of natural language. Other languages, notably Spanish and German, do not diphthongize their corresponding vowels. The tendency to diphthongize these vowels is one characteristic of the "foreign accent" that betrays English speakers when they begin to learn these languages.

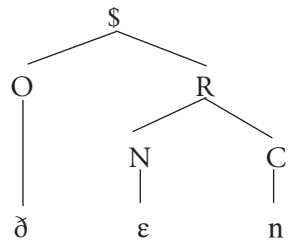
SYLLABLES AND FEET

It's a lot easier to count syllables than to give them a satisfactory definition. If the entire class were to count the syllables in this paragraph, there would be considerable agreement about the number, but probably not about where each syllable begins and ends. The fact that syllabic writing systems developed before alphabetic systems (see our Spelling chapter in Book II) suggests that syllables are very salient linguistic units. That children seem to be able to associate symbols with syllables before they can associate symbols

with phonetic segments also points to the importance of the syllable.

Every **syllable** (symbolized as $) consists of at least a **nucleus** (symbolized as N), which is typically a vowel. The nucleus may be preceded by an **onset** (symbolized as O), consisting of one or more consonants, and followed by a **coda** (symbolized as C), again consisting of one or more consonants. The nucleus and the coda together make up a unit called the **rhyme** (R). The diagram (3) illustrates the constituent of the single-syllable word *then*.

(3)



Because vowels are high in sonority, a syllable nucleus is usually a vowel. However, a consonant with high sonority, such as [l,r,m,n,ŋ] may also be a nucleus. The sonority level of a syllable thus rises from the onset (if there is one) up to a peak in the nucleus and falls off again in the coda. In this respect, the onset and coda are (almost) mirror images of each other.

Parts of syllables may be repeated for poetic effects. Of these repetitions, rhyme is the most important: it involves repeating the rhyme of syllables, usually at the ends of lines, as the rhyming words in the following stanza show:

(4) Piping down the valleys wild,
Piping songs of pleasant glee,
On a cloud I saw a child,
And he laughing said to me:
(William Blake, Introduction to *Songs of Innocence*)

The syllable onsets, [w] of *wild*, [tʃ] of *child*, [gl] of *glee*, and [m] of *me* are not part of Blake's rhymes.

Repeating onsets, or first sounds in onsets, as in ***th**en and **th**ere*, creates **alliteration**. Repeating nuclei, as in *M**i**key l**i**kes it*, or *the incr**e**dible **e**dible **e**gg* creates **assonance**.

In speech, syllables are combined into rhythmic units called feet, which are also of considerable importance in scanning lines of poetry. Each **foot** consists of at least one stressed syllable (its energy peak) and one or two

unstressed syllables. Feet are differentiated from each other by the number of stressed syllables they contain and by the position of the stressed (S) syllable(s) relative to other syllables in the foot. In (5), S represents a stressed syllable and U an unstressed one; the stressed syllable of each example word is bolded.

(5)	Iambic:	[U S]	to**day**
	Trochaic:	[S U]	**tro**chee
	Anapestic:	[U U S]	inter**vene**
	Dactylic:	[S U U]	**per**sonal
	Spondaic:	[S S]	**good news**

In English, stressed syllables tend to be approximately equally far apart in time; as a result unstressed syllables may be articulated slower or faster, depending on the type of foot. (See Beers (2003: 339) Appendix I: the 175 most common syllables (as ordinarily spelled) in the 5,000 most frequently occurring English words.)

Exercise

1. In the stanza given in (4) above, identify each stressed syllable, determine the feet, and identify the kind of meter (iambic, trochaic, etc.) used.

2. How does your dictionary identify syllables and the stressed syllable(s) in words? Why does your dictionary indicate syllabication of words? (You'll probably have to read the relevant section of your dictionary's front matter for this.) Would your dictionary and our system always give the same syllabic analysis of words?

3. Compare the phonetic alphabet we introduced here with the system used in your dictionary to indicate pronunciation. Which is simpler to learn? Which is simpler to use? For whom? What other pros and cons can you think of for each?

PHONOLOGY

While phonetics is the study of the ways in which speech sounds are produced, **phonology** is the study of (1) how the speech sounds of a language are used in that language to distinguish meaningful units (such as words)

from each other, and (2) how sounds are patterned in a language. Consequently, the study of phonology requires us to take meaning into consideration, while phonetics does not. In this section we explore phonology and the basic unit of phonological analysis, the **phoneme**.

PHONEMES

You might reasonably have assumed that whenever speakers distinguish between a pair of sounds, they will use that difference to distinguish between words. For example, we know that English speakers distinguish between [s] and [z], and we use this difference to signal the difference between the words *sip* and *zip*. We will say that [s] and [z] **contrast** with each other in English. In fact, all of the sounds we have described so far contrast with each other in English and so are used by English speakers to distinguish words from each other. You can test this out by taking any pair of sounds (as we took [s] and [z]) and creating a pair of words (like *sip* and *zip*) which are identical, except that where one has one sound, the other has the other sound, just as where *sip* has [s], *zip* has [z]. Pairs of words like this are called **minimal pairs**, and are used to demonstrate that pairs of sounds are used in a language to distinguish words from each other. Sound units that distinguish words from each other are called **phonemes**. We enclose phonemes in / / (e.g., /s/, /z/) to distinguish them from sounds ([s], [z]) and ordinary letters (<s>, <z>).

Exercise

Phonemes are most easily identified through minimal pairs. Thus *Pete* [pit] and *beat* [bit] differ only in that where [pit] has [p], [bit] has [b]. These two words make a minimal pair that shows that [p] and [b] represent separate phonemes in English, which we symbolize as /p/, /b/. For each pair of sounds below, identify a minimal pair that shows that they represent different phonemes.

[k]–[g]	[θ]–[ð]	[ɑ]–[æ]	[l]–[r]
[n]–[ŋ]	[w]–[j]	[aɪ]–[aʊ]	[f]–[dʒ]
[f]–[s]	[i]–[ɪ]	[aɪ]–[oɪ]	[tʃ]–[dʒ]
[s]–[ʃ]	[ɛ]–[æ]	[tʃ]–[s]	[k]–[ŋ]

ALLOPHONES

Now listen to the vowels in the words *cat* and *cad*. Are they identical or different? We hope you said "different." Can you now say how they differ? We

hope you said that one was longer than the other. Now listen to the consonants after the vowels. Are these the same or different? Again, we hope you said different, and that you know that [t] is voiceless and [d] is voiced. Now, which vowel, the longer or the shorter, precedes [d] and which precedes [t]? We hope you said that the longer vowel precedes the voiced consonant.

Are the two vowels similar in any way? Again, we hope you said that they seem to be longer and shorter versions of the same vowel, [æ]. Let's use [ː] to indicate extra length. So, the vowel before voiceless [t] is just [æ], but the one before voiced [d] is [æː].

Now let's listen to some more word pairs like *cat* and *cad*:

root	rood
moat	mode
leaf	leave
gape	Gabe

Listen to the vowels in each pair. You should hear that the vowel in the second word in each pair is a little longer than the vowel in the first.

Now determine the similarities and differences between the consonants after the vowels in each word pair. You should find that the consonant in the first word is the voiceless version of the consonant in the second word.

Turning our attention again to the vowels in each word pair: how are they related? We hope you said that they were very similar vowels, specifically, short and long versions of the same vowel.

You should now be able to determine a very general rule of English. When are vowels lengthened and when are they not lengthened?

Your answer should be something along the lines of: *English vowels are lengthened when they occur before a voiced consonant; otherwise they are not lengthened*.

So far we've seen [æ] and [æː], [u] and [uː], [o] and [oː], [i] and [iː], and [e] and [eː]; in each case the longer vowel occurs before a voiced consonant. We've also noted that the vowels are otherwise virtually identical—they differ only in length. So it makes good sense to regard these pairs of vowel sounds as slightly different pronunciations of the same vowel, and that whether the vowel is lengthened or not depends on whether the consonant that follows it is voiced or not.

Importantly, the long and short pairs of vowels do not contrast with each other: English contains no pairs of words that are identical except that where one contains a short version of a vowel, the other contains the longer version of the same vowel. Consequently, the long and short versions of

vowels do not represent separate phonemes.

Let's now turn our attention to some consonants. For example, English speakers pronounce the [t] in *toll* differently from that in *stole*. The [t] of *toll* is breathier than the [t] of *stole*. The former is said to be **aspirated**, and the latter **unaspirated**. We represent the aspirated [t] as [tʰ], with the **diacritic** [ʰ] indicating aspiration. We represent the unaspirated [t] as [t] with no diacritic. The important point here is that English speakers do not signal any difference in meaning with the difference between [tʰ] and [t]. They treat the two sounds as variant ways of pronouncing the "the same sound." Substituting one of these sounds for the other would not affect the meaning of a word, but it would create an odd and perhaps non-native pronunciation of the word. No pair of English words is distinguished solely by the difference between [t] and [tʰ]. You can satisfy yourself that this is so by trying to find a minimal pair of English words differentiated solely by the fact that where one has an aspirated consonant the other has an unaspirated version of that same consonant. (Don't spend too long trying!)

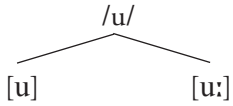
Let's now look at a different pair of English sounds. If we replace the [t] in [rɑt] (*rot*) with [d], then we get the sequence of sounds [rɑd] (*rod*), which, of course, is quite distinct in meaning from *rot*. Clearly, English speakers treat the difference between [d] and [t] differently from the way they treat the difference between [tʰ] and [t] and between longer and shorter versions of vowels. In the case of [t] and [d], the difference can signal a difference in meaning; in the other cases it cannot. Differences in sound that signal differences in meaning are said to be **phonemic**, **distinctive**, or **contrastive**. Differences in sound that do not signal meaning differences are **non-distinctive** or **non-contrastive**. One objective of phonology is to identify which sound differences are contrastive and which are not. As we have seen, the contrastive sound units are called phonemes.

Phonemes and allophones

A good way to think about a phoneme is as a group of phonetically similar sounds that are treated as members of the same sound category. Because the members of a sound category are treated as "the same sound" in a language, they cannot be used for communicating differences in meaning. English speakers treat [tʰ] and [t] as belonging to the same sound category, so they cannot be used to distinguish one word from another. Different phonemes are different categories of sounds and the differences among these categories can signal differences in meaning. English speakers treat [t] and [d] as belonging to different sound categories—/t/ and /d/, respectively—and so

these can be used to differentiate one word from another.

Sound categories are abstractions. We can only perceive them when one of their members is pronounced. The sounds that make up the category are called the **allophones** of that phoneme. Thus [t] and [tʰ] are allophones of the English phoneme /t/. Notice that the individual sound symbols are the same as those we used for phonetics, but to distinguish phonology from phonetics, we enclose phonemes in **slanted brackets** / / and use square brackets [ ] for phonetic notation. Perhaps the following diagram will help. It represents the phoneme /u/ and two of its allophones:



That is, the phoneme /u/ is pronounced in (at least) two ways, [u] and [uː], depending upon its context. Table 8 lists the phonemes of English.

Consonants:	/p, t, k, b, d, g, m, n, ŋ/
	/f, θ, s, ʃ, h, v, ð, z, ʒ/
	/tʃ, dʒ/
	/r, l, w, j/
Vowels:	/i, ɪ, e, ɛ, æ, ɑ, ɔ, o, ʊ, u, (ə)/
Diphthongs:	/ɔɪ, aʊ, aɪ/

TABLE 8: ENGLISH PHONEMES

As you have no doubt noticed, there are nearly 40 phonemes of English (the number varies somewhat from dialect to dialect), while there are only 26 letters in the English alphabet. This is one of the reasons why the alphabet appears to fit the language so poorly. (For more on English spelling see our chapter on Spelling in Book II.)

Exercise

1. What phoneme is represented by the bolded letter(s) in the following words? Make sure to enclose the symbols you choose in the phoneme slashes / /.

***t**on, **b**ump, **d**ip, **c**omb, **ch**in, **z**oom, **sh**ave, **m**ango, thi**ng**, **l**ame, **r**ead, sl**ee**p, **r**ed, **m**at, **g**ood, **c**au**gh**t, **k**ite, **b**id, **c**oy.*

2. Transcribe the following words in a phonemic (**broad**) transcription. That is, just represent the phonemes that each word is composed of and ignore the allophonic detail.

thin, then, cheese, rouge, June, shin, fling, heave, yak, cow.

Allophones and their contexts

We have already noted that if we substitute the aspirated allophone of /t/ for its unaspirated relative, then we create an odd pronunciation of a word. [tʰɪl] is the typical American English pronunciation of *till*, but [tɪl] is not. What, if any, patterns can we observe in where allophones of a phoneme can and cannot occur?

Some allophones of a phoneme are in **complementary distribution**, that is, they occupy different positions (**contexts** or **environments**) in words—where one can occur the other cannot. As we have seen, English has a very general pattern of lengthening vowels before voiced consonants. That is, the allophone of a vowel phoneme before a voiced consonant will be appreciably longer (up to three times longer) than the allophone of the same vowel phoneme before a voiceless consonant. For example, listen to the pronunciation of /ɛ/ in *bet* and *bed*. You should have little difficulty in hearing the difference in vowel length. We can represent the pattern of occurrence (**distribution**) of these two allophones of the phoneme /ɛ/ as the following **phonological rule**: *When the phoneme /ɛ/ occurs before a voiceless consonant it is pronounced as its allophone [ɛ]; when it occurs before a voiced consonant it is pronounced as its allophone [ɛː].* (Remember: [ː] is a diacritic indicating a lengthened sound.)

In fact, the rule is much more general than this. Because it applies to all vowels, we can write it as: *In English a vowel is longer before a voiced consonant than it is before a voiceless one.* One of our objectives in studying a language is to be able to describe these sound patterns, i.e., to be able to specify in the most general terms possible the phonetic environments in which each allophone occurs.

Let's look at another very systematic set of English vowel allophones. The vowels of *cap* and *can* differ phonetically: that of *cap* is a plain [æ]; that of *can* is **nasalized**, represented by [æ̃]. (If you have trouble hearing the difference, try starting to say each word normally and then omit the final consonant.) The phoneme /æ/ thus has the allophones, [æ] and [æ̃]. In fact, all English vowels have both nasalized and non-nasalized allophones. We can represent this as the rule: *Whenever an English vowel occurs before a nasal consonant, it becomes nasalized; otherwise it is non-nasalized.*

In fact, the situation is a bit more intricate that this. Because nasals are voiced, we should expect a vowel before them to be lengthened relative to the same vowel before a voiceless sound. And, indeed, this is what we find. Listen to the vowels in *cat*, *cad*, and *can*. You should notice that the first vowel is unlengthened, [æ]; the second one is lengthened, [æː]; and the third one is both lengthened (in fact, probably even more than the second one) and nasalized, [æ̃ː].

Exercise

1. What sounds are presented by the bolded letter(s) in the following words? Provide an allophonic (**narrow**) transcription.

   m**a**d, b**a**ck, s**p**ill, **c**at, t**a**ng

2. Try your hand at distinguishing allophones of phonemes. Using the discussion above as a guide, see if you can describe the phonetic differences between the allophones of the designated phoneme in the example words.

   a. /k/: kin, skin
   b. /ɛ/: bet, Ben
   c. /e/: rate, raid
   d. /æ/: bat, bad
   e. /l/: lead, pull
   f. /k/: cool, keel

PHONOLOGICAL RULES

As we saw above, a **phonological rule** is a general statement about the distribution of a phoneme's allophones, e.g., those of /t/. There are several types of phonological rules to represent the several patterns of distribution of sounds in a language.

The rule for the [tʰ] allophone of /t/ can be seen as adding extra breathiness after the release of a voiceless stop. This rule adds the aspiration feature to the consonant. Such rules are referred to as **feature addition rules**.

Exercise

Listen carefully to the sounds represented by the bolded letters in each of the following pairs of words: ***st**eal, **t**eal; s**p**in, **p**in; s**k**ate, **K**ate*. What phonetic difference can you hear between the [t] of *steal* and the

[t] of *teal*? Write the two sounds in narrow (allophonic) phonetic transcription. Where does each of these two sounds occur in the example words? Answer the same questions for the [p] of *spin* and *pin* and the [k] of *skate* and *Kate*. What general pattern applies to all three pairs of sounds? Express this general pattern as a phonological rule.

Feature changing rules change the value of a component feature of a sound, for instance, from non-nasal to nasal or from short to long. The nasal pronunciation of the vowel of *can* is due, as we've seen, to the influence of the nasal consonant /n/ that comes immediately after it. In this case, the rule changes an oral (non-nasal) sound to a nasal one.

Segment deletion rules remove sound segments. For instance, in informal speech, a segment deletion rule removes the second of a pair of consonants at the end of one word when the next word begins with a consonant. Thus words such as *frost* and *ask* are pronounced as [fras] and [æs] when they occur before consonants (e.g., *Ask Katie*). This effect is especially likely when the last consonant of the first word is phonetically similar to the first consonant of the next word, as in *used to* [jus tə], instead of [just tə], (which leads to the incorrect spelling *use to*). French adjectives which end in consonants routinely lose those consonants if the following word begins with a consonant: 'small friend' *petit ami* [pətit ami] vs. 'small book' *petit livre* [pəti livr].

Phonological rules may also reverse the order of segments in words. In some dialects of English the verb *ask* is pronounced as [æks], reversing [s] and [k]. Several hundred years ago, the word *bird*, now pronounced as [bərd] was pronounced [brɪd]. The vowel and the [r] switched places. Rules that reverse a sequence of segments are called **metathesis rules**.

Some rules, such as the vowel nasalization rule, make a segment and its neighbor more alike. Such rules are called **assimilation rules**.

Exercise

1. (a) Identify the rapid, natural pronunciation of the sound represented by the letter <n> in the words *input, intake,* and *inquest*. (b) Identify the sound immediately after the sound represented by <n> in each word. (c) In what ways are the sound represented by <n> and the sound immediately following it in each word similar? (d) Express the similarity between the members of the pairs of sounds in all three words in one general rule. (e) What kind of phonological rule is this?

2. Examine the rapid, natural pronunciation of <n> in the phrases below. Write each entire phrase phonemically. Then try to state a rule that accounts for the different pronunciations. What type of rule did you discover?

a. In Bill's house
b. In Ted's house
c. In Greg's house

3. Describe the phonetic difference between the allophones of /k/ (written as <c> and <k> in ordinary spelling) in the two columns of words:

coop	keep
could	kid
coat	Kate
cot	cat

Express the difference and the distribution of the allophones as a phonological rule. What kind of rule did you come up with?

Assimilation can be so thoroughgoing that two sounds can merge into one. For example, [t,d,s,z] are palatalized—i.e., pronounced [tʃ, dʒ, ʃ, ʒ] respectively—when they occur at the ends of words and the next word begins with the palatal glide [j]. For example, *Did you?* is typically pronounced as [dɪdʒə] or even [dʒə]; the [dʒ] results from the coalescence of [dj].

The study of phonology shows that languages make use of unpredictable units (phonemes) to differentiate words from each other. It also shows that languages employ very general patterns of sounds. By representing the general, predictable patterns as phonological rules, we leave only that information which is unpredictable and idiosyncratic to be listed in the set of phonemes. This way we minimize the number of basic phonemic units we need to posit; we also minimize the number of times any given piece of information is mentioned, thus simplifying the overall grammar or description of the language. For example, English has two series of vowels, those with and those without nasalization. The nasalized vowels occur only before nasal consonants; the non-nasalized ones occur everywhere else. If we merely listed all these vowels as belonging to the language, then we would have postulated far more basic units than we—or native speakers—really need. And we would have missed the generalization that the two series of vowels are really quite alike, one series being merely a predictable positional

variant of the other. We capture this generalization by eliminating the series of nasalized vowels from our inventory of basic units and replacing it with the nasalization rule.

Exercise

1. Arabic speakers learning English often produce [b] where English requires [p], e.g., saying "bark" instead of "park." Describe the phonetic difference between [b] and [p].

2. We noted that English has approximately 40 phonemes but only 26 letters of the ordinary alphabet to represent them. Illustrate with appropriate examples at least three ways in which the English spelling system uses those 26 letters to represent its almost 40 phonemes.

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GLOSSARY

AFFRICATE: sound produced with full stoppage of the airstream followed immediately by constriction.

ALLOPHONE: non-distinctive phonetic variant of a phoneme.

ALVEO-PALATAL: sound produced at the hard palate just behind the alveolar ridge.

ALVEOLAR: sound produced at the alveolar ridge, the bony ridge behind the teeth.

APPROXIMANTS: sounds produced when the articulators approach each other but not so closely as to cause turbulence in the airstream; they include laterals (the tongue touches the top of the mouth but the air is allowed to pass along one or both sides, as in [l]); central (the sides of the tongue are raised so that air flows along the center of the mouth, as in [r]); as well as the labiovelar [w] and palatal [j].

ASPIRATED: consonant sound released with a puff of air.

ASSIMILATION RULE: phonological rule that makes a sound similar to a nearby sound. e.g., palatalization.

BACK VOWEL: vowel produced with the back of the tongue raised toward the soft palate.

BILABIAL: sound produced with constriction or closure of the lips.

BROAD TRANSCRIPTION: the attempt to record pronunciation without regard to non-contrastive details. See **NARROW TRANSCRIPTION**.

CENTRAL: vowel—e.g., [ə]—produced with the tongue raised at the center of the mouth rather than at the front or back.

CODA: last part of a syllable; follows the nucleus.

COMPLEMENTARY DISTRIBUTION: when the allophones of a phoneme occupy different positions in words.

CONSONANT: sound produced with complete or partial obstruction of the air flow through the mouth. See **VOWEL**.

CONTRASTIVE (also **DISTINCTIVE**): sounds used in a language to signal differences of meaning.

DIACRITIC: phonetic symbols used to represent fine differences in pronunciation, e.g., the [ʰ] that indicates aspiration.

DIPHTHONG: vowel unit that begins with one oral configuration and ends with another. See **MONOPHTHONG.**

DISTINCTIVE: See **CONTRASTIVE.**

DISTRIBUTION: specific circumstances (**ENVIRONMENTS**) in which a sound oc-

curs, e.g., at the beginning, middle, or end of a word.

ENVIRONMENT: See **DISTRIBUTION**.

FEATURE CHANGING RULE: rule that changes the value of a component feature of a sound, e.g., from stop to fricative, from non-nasal to nasal, or from lax to tense.

FOOT: a rhythmic unit consisting of at least one stressed syllable and 1-2 other syllables, typically unstressed.

FRICATIVE: sound produced with constriction of the airstream, producing friction.

FRONT VOWEL: vowel produced with the front of the tongue raised toward the hard palate.

GLIDES: sounds, e.g., [j] and [w], that are intermediate in openness and sonority between consonants and vowels. Also called **SEMIVOWELS**.

GLOTTAL: sound produced by constricting or stopping the airstream at the vocal folds.

HIGH VOWEL: vowel pronounced with the mouth in the least degree of openness. See **MID VOWEL** and **LOW VOWEL**.

INTERDENTAL: sound produced with the tongue protruding between the teeth.

LABIODENTAL: sound produced with constriction between the bottom lip and top teeth.

LABIOVELAR: sound produced by raising the back of the tongue to or toward the velum and rounding the lips, e.g., [w].

LATERAL: sound produced with the tongue touching the top of the mouth with air allowed to pass along one or both sides, as in [l].

LAX: sound produced with musculature of the mouth relatively relaxed. See **TENSE**.

LOW VOWEL: vowel pronounced with the mouth in the greatest degree of openness. See **HIGH VOWEL** and **MID VOWEL**.

MANNER OF ARTICULATION: the kind of closure or constriction used in making a consonant sound.

METATHESIS RULE: phonological rule that reverses the order of segments in words.

MID VOWEL: vowel pronounced with the mouth in an intermediate degree of openness. See **HIGH VOWEL** and **LOW VOWEL**.

MINIMAL PAIR: two words of different meaning that are phonetically the same except for one sound, e.g., **p**it and **b**it (used to demonstrate that [p] and [b] contrast with each other).

MONOPHTHONG: vowel unit consisting of a single segment held constant during its pronunciation. See **DIPHTHONG**.

NARROW TRANSCRIPTION: attempt to record non-contrastive details of pronunciation. See **BROAD TRANSCRIPTION**.
NASAL, NASALIZED: sounds articulated with air flowing through the nasal cavity.
NON-CONTRASTIVE (also **NON-DISTINCTIVE**): sounds not used in a language to signal different meanings.
NUCLEUS: central part of a syllable, i.e., the segment with the highest sonority.
ONSET: initial part of a syllable; precedes the nucleus.
PHONEME: contrastive or distinctive sound category; distinguishes words from each other.
PHONETICS (**ARTICULATORY**): the study of how speech sounds are produced.
PHONOLOGICAL RULE: a general statement about the distribution of a phoneme's allophones and about other phonological processes.
PHONOLOGY: the study of the ways in which a given language shapes sounds into distinctive categories of perception and of its rules of pronunciation.
PLACE OF ARTICULATION: the area in the mouth at which the consonantal closure or constriction occurs.
RHYME: the nucleus and coda of a syllable.
ROUNDED: vowel sound produced with the lips pursed. See **UNROUNDED**.
SCHWA: a mid central unrounded vowel, represented as [ə].
SEGMENT DELETION RULE: phonological rule that eliminates a sound from pronunciation in a word or phrase.
SEMIVOWEL: see **GLIDE**.
SONORANT: sounds produced with a smooth airflow, allowing for a high degree of resonance.
STOP: sound produced with full stoppage of the airstream anywhere in the *oral* cavity from the vocal folds to the lips.
TENSE: sound produced with musculature of the mouth relatively tight. See **LAX**.
UNROUNDED: vowel produced without lip rounding. See **ROUNDED**.
VELAR: sound produced with constriction at the soft palate.
VOICED: sound produced with the vocal folds vibrating.
VOICELESS: sound produced with the vocal folds not vibrating.
VOWEL: sound produced with smooth, unobstruction air stream through the mouth. See **CONSONANT**.

VILNIUS UNIVERSITY
FACULTY OF PHILOLOGY

Giedrė Balčytytė-Kurtinienė

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CONTENTS

FOREWORD 5

1. VARIETIES OF ENGLISH 7
   1.1. Varieties of Language 7
   1.2. Standard English 7
   1.3. Received Pronunciation 8
      1.3.1. History of RP 8
      1.3.2. RP Today 9
      1.3.3. Types of RP 10
   1.4. On Cockney and Estuary English 10
   1.5. Global English 11

2. PHONETICS AND PHONOLOGY 13
   2.1. The Object of Phonetics and Phonology 13
   2.2. On Phone, Phoneme, and Allophone 13
   2.3. The Branches of Phonetics 14

3. SPEECH MECHANISMS IN ARTICULATORY PHONETICS 16
   3.1. The Stages in Sound Production 16
   3.2. Initiation or Respiration 17
   3.3. Phonation 18
   3.4. The Oronasal Process 20
   3.5. Articulation 21

4. ENGLISH PHONEMES 26
   4.1. The International Phonetic Alphabet and Transcription 26
   4.2. Sound Classes: Vowels, Consonants, and Sonorants 27

5. CHARACTERISATION AND CLASSIFICATION OF VOWELS 31
   5.1. The Cardinal Vowel Diagram 31
   5.2. The Height of the Tongue 32
   5.3. The Advancement of the Tongue 33
   5.4. The Shape of the Lips 33
   5.5. Tenseness and Length 34
   5.6. Diphthongs and Triphthongs 36

6. CHARACTERISATION AND CLASSIFICATION OF CONSONANTS 39
6.1. The Place of Obstruction 39
6.2. The Manner of Obstruction 42
6.3. Voicing 43
6.4. Articulation of the Plosive Consonants 44

7. ABOVE THE SEGMENTAL LEVEL:
ALLOPHONES AND THEIR CONTEXTS 46
7.1. Pre-Fortis Clipping 46
7.2. Aspiration 46
7.3. Palatalised /l/ 47
7.4. Allophonic Release of the Plosives 47
7.5. Treatment of /ŋ/ 48
7.6. Treatment of /r/ 49
7.7. Treatment of Final /s/, /z/ and /ɪz/ 49
7.8. Treatment of Final /t/, /d/, and /ɪd/ 49

8. THE SYLLABLE 53
8.1. The Structure of the Syllable 53
8.2. Word Stress 54
8.2.1. Levels of Stress 55
8.2.2. Placement of Stress 55
8.2.3. Stress in Word Class Pairs 58
8.2.4. Stress Shift 59

9. STRONG AND WEAK FORMS IN RELATION TO SENTENCE STRESS ... 65
9.1. Content Words and Function Words 65
9.2. Reduction 65

A LIST OF ABBREVIATIONS 70

A GLOSSARY WITH LITHUANIAN EQUIVALENTS 71

REFERENCES 76

FOREWORD

This course is meant to help English as a Foreign Language (EFL) university students familiarise themselves with the basics of English phonetics. It covers the English phonetics syllabus, which is generally taught in the 1st semester of an English philology programme at the university level. It provides information on the sound system of English and deals specifically with some specific problems faced by Lithuanian as well as by international EFL learners. This course focuses on segmental phonetics and beyond: the structure and linguistic function of the articulatory apparatus, the characteristics and classification of vowels and consonants, the International Phonetic Alphabet and its use in phonetic transcription. It also briefly expands on the syllable and word stress. It basically serves as a background for further readings on suprasegmental phonetics and aspects of connected speech.

Because the course is organised so as to cover the workload of one semester, it does not compete with other more extensive introductory courses to phonetics. Bearing in mind that there already exist excellent introductions to phonetics, extensive theory and practice books containing pronunciation drills and exercises, phonetics seems to be a well-provided field. This course, however, attempts to present a short, synthesised, and systematic approach to English phonetics and serves as a guideline for further reading for students. The theoretical framework is principally based on the work of Clark and Yallop (1992), Roach (2009), Crystal (2004, 2008), Gimson and Cruttenden (2008), Collins and Mees (2003) and the other works mentioned in the list of references. Last, but not least, the course aims to continue the work of the Lithuanian phoneticians R. Aprijaskytė and L. Pažūsis whose invaluable contribution to the field motivates and provides us with comprehensive knowledge.

This course contains nine sections that are arranged according to the course's unit content. Section 1 opens with an explanation of the terms dialect and accent as well as a justification for the choice of received pronunciation (RP). Section 2 introduces the readers to the key sound concepts: phone, phoneme, and allophone. It also annotates the science of phonetics and phonology. In Section 3, articulatory apparatus and sound production are examined. Section 4 familiarises the students with the International Phonetic Alphabet and introduces the development of

transcription skills. Sections 5 and 6 present the characteristics and classifications of vowels, consonants, and sonorants. In Section 7, several complex phonemes and their allophones are detailed in terms of their articulation and distribution. Section 8 expands beyond the segmental level and briefly dwells on the concept and the structure of the syllable. In addition, stress placement is discussed with reference to complex stress patterns in longer words and compounds. Finally, strong versus weak forms of function words are presented under the influence of sentence stress in Section 9.

Each section also features a list of further reading options, a terminology self-assessment, and several study questions and exercises, which are predominantly focused on the formation of transcription skills. Students are also provided with a glossary that uses Lithuanian equivalents to help explain the key terms and complex anatomy concepts.

The course is not intended to overload the students with theory reading, thus allowing considerable time and opportunity for practice in a language laboratory and offering flexibility for incorporating the instructor's personal preferences for teaching the course. For the extension of this particular course, a suprasegmental study should follow to give students the full picture of English phonetics.

Orthography

For the purpose of convenience, the following orthographic notations are used: target spelling entries are written in *italics*, e.g. *team*, and target transcription entries are highlighted in navy blue and inserted either between slashes for phonemic transcription, e.g. /tiːm/ or, in rare cases, between square brackets for allophonic transcription, e.g. [tʰiːm] (for further details see Section 4). To visually distinguish the basic theory concepts and terms, they are written in **bold**.

The text also features tables, which give synthesised theory concepts and examples, as well as several figures either adapted from Roach (2009) or referenced to their original sources.

1. VARIETIES OF ENGLISH

1.1. Varieties of Language

Varieties of language refer to the differences in the systems of a language that emerge from social, historical, geographic, social, and other changes. In other words, a language variety is "a system of linguistic expression whose use is governed by situational variables" (Crystal 2008: 509). A **dialect** is governed by regional or social distinctiveness and is identified by particular vocabulary, pronunciation, and grammatical structures. Crystal (2008) states that languages develop dialects when they are used by a large number of speakers and if there are "geographical barriers separating groups of people from each other or […] divisions of social class" (2008: 509). All people speak a dialect. A group of people who speak a certain dialect is often referred to as a **speech community**. A language variety that is defined on social grounds is called a **sociolect**. It primarily applies to a particular social class of people or to an occupational group. A regional dialect or **regiolect**, conversely, describes the language spoken in a particular geographic area. An **idiolect** is the individual and unique use of language restricted to a single speaker. This term implies an awareness that each individual speaks in a different manner in terms of vocabulary, grammar, pronunciation, and levels or styles of language use. An **accent** refers to pronunciation only. An accent may be considered to be a spoken representation of a dialect because it reflects "those features of pronunciation which identify where a person is from, regionally or socially" (Crystal 2008: 3). As all people speak a dialect, all people have an accent. A predominating dialect may become the official or **standard** form of the language. Often it is referred to as a prestige variety or, as Crystal (2008) calls it, an "institutionalised form" (2008: 450), the term which is used in the mass media, foreign language teaching, etc. **Nonstandard** varieties, consequently, are defined as dialects which "do not conform to this norm" (Crystal 2008: 450).

1.2. Standard English

Internationally, there are many varieties of English as it is spoken worldwide as a first or a second official language. As a first language, it is spoken in the United

Kingdom, the United States of America, Canada, Ireland, Australia, New Zealand, South Africa, and some islands in Central America. Today all English-speaking nations have their own national varieties of English. A **national variety** is defined as the speech of a nation, e.g. British English, American English, Australian English, Canadian English, etc. Each national variety holds its standardised language as Standard English, General American, etc.

This course is based on **Standard English (SE),** the norm of British English. Trudgill (1999) calls SE "the most important dialect in the English-speaking world from a social, intellectual and cultural point of view" (1999: 123). SE is not regionally based, but instead, it is a purely social dialect. It is the variety of English associated with high status, promoted by educational institutions, used in government, law courts, the church, and media. It is used for printed texts and formal speeches. The linguistic features of this standard variety, however, are matters of grammar and vocabulary, but not pronunciation. As a result, SE is spoken in various accents that vary according to their regional origin, and the social group, or ethnicity of the speaker. The accent which is most often associated with SE is known as **Received Pronunciation.**

1.3. Received Pronunciation

Received Pronunciation (**RP**) is the pronunciation that is associated with the educated, typically the middle and upper classes of the community. As with the SE dialect, RP is also identified not so much with a geographical region as with a certain social group. It has connotations of prestige and authority and is an indicator of formal speech. Various terms for RP include **The Queen's English, Public School Accent, Oxford English, BBC English, the accent of the Court**, etc. All the expressions mentioned above reflect important historical and social aspects of RP.

1.3.1. History of RP

The historical origins of SE can be traced back to the 16th century (Fisher, 1993) when prestige and authority became attached to one accent, particularly the accent used by the court and the central administration in London. Being the language of the educated "upper social class" people, this pronunciation was perceived as the correct and accepted version, whereas other accents were treated as corrupted forms of the norm.

The 19th century saw a flowering of the prestige public schools and this contributed greatly to the growing importance placed on the accepted accent. During the course of the century, the royal family and the upper-class members of the society, attended boarding schools such as Eton, Winchester, Harrow, Charterhouse, Westminster, or Rugby, and they graduated from Oxford and Cambridge Universities. The prestigious accent they used gained a unique status and "became the kind of pronunciation passed down from one educated generation to the next" (Crystal 2004: 3). The term "Received Pronunciation" was proposed in 1869 by the linguist A. J. Ellis, however it was not a widely used term until the phonetician D. Jones adopted it in the second edition of the English Pronouncing Dictionary in 1924.

RP probably received its most accepted status in 1922 when it was adopted as the British Broadcasting Cooperation (BBC) broadcasting standard. The BBC only employed announcers and newsreaders who were RP speakers. To supplement its language policy, the BBC Advisory Committee on Spoken English was established in 1926. After World War II, it was renamed "the BBC Pronunciation Unit", and its authority diminished to that of providing guidelines to newsreaders on the pronunciation of geographical and personal names. The unit still functions today, although modern BBC newsreaders and announcers more often speak in mild local accents and modified RP rather than in its pure form. Moreover, the BBC Overseas Service has taken to using a number of newsreaders from regional stations whose English, by British standards, has a strong foreign accent. Nevertheless, Roach (2009) claims the BBC is still respected by many people in Britain and abroad as a model of good English and can still be classed as **BBC English**.

1.3.2. RP Today

Recent estimates suggest only 3-5% of the UK population speaks RP today. Despite its statistical insignificance, it is still the language of the educated, the most widely studied, and the most frequently described variety of spoken English in the world. Moreover, as England is a place where a person's accent still represents an important index as to the social and educational background of the speaker, RP still maintains its high status.

As well as being a prestigious accent, RP is also a concept in phonetics. Phonemic transcriptions in dictionaries are based on this particular accent, and it serves as a standard for EFL learners in Europe. Therefore, the current social and linguistic status of RP is of special relevance to EFL university students. Moreover, in the field

of accent studies, RP is widely used as a reference accent for comparison with other varieties.

1.3.3. Types of RP

RP, like all accents, changes constantly and incorporates new phenomena, while others are lost. Consequently, different subtypes of RP can be distinguished, which are more or less conservative or progressive, and which are spoken by different age groups. Gimson and Cruttenden (2008) identify three main types of RP:

1. **Conservative RP**, which is the most resistant to change and is characteristic of older generations. It is traditionally used by certain professions or social groups;
2. **General RP**, which is commonly defined as the pronunciation adopted by the BBC and is the type most commonly in use;
3. **Advanced RP**, which typifies attempts to change and is chiefly used by young people of exclusive social groups.

Wells (1982) makes a similar distinction by reducing the number to two types:

1. **Mainstream RP,** which largely corresponds to general RP and is the unmarked and modern type of RP, traditionally spoken by BBC newsreaders.
2. **Upper-Crust RP**, which is a more conservative and old-fashioned type of RP, mostly associated with elderly people, the upper class, or the members of the royal family.

It is also common to distinguish between RP and what Wells (1982) calls **Near-RP** accents. These are close to Mainstream RP but accommodate mild regionalisms and therefore do not fall completely within the boundaries of RP.

1.4. On Cockney and Estuary English

Cockney is a British accent, which originated in the East End of London. It is often associated with London's working class, and originally attributed to those who were "born within the sound of Bow Bells" (Wells 1982: 302), i.e. the bells of Saint Mary-le-Bow Church in Cheapside in London. For some time, the Cockney accent was scorned and regarded as inferior. However, it is currently an accent trending among middle-class Londoners. McArthur and McArthur (2005) indicate the following pronunciation features typified for Cockney accent: glottal stops (see p. 43), /l/ vocalisation (see p. 43), th-fronting (/v/ and /f/ sounds instead of /θ/ and /ð/),

and other phonetic features that have become characteristic in and around London and are notably favoured by the young.

Estuary English (EE) is the term, which seems to best reflect the predominant modern accent in London. EE seems to comprise both the prestige of RP and the back-to-modern features of working-class Cockney. Rosewarne (1994: 3) calls it "the accent between Cockney and the Queen." EE "supposedly originated in the counties adjacent to the estuary of the River Thames" (Crystal 2008: 173), and thus displays the influence of London regional speech. Rosewarne (1994) claims that this form of speech is a new sort of standard, which has replaced RP and is favoured by the young upwardly mobile people in all spheres of life, including professionals. Roach (2009) states that EE is not really an accent, but more a modern deviation from RP used in the London area and characterised by glottal stops and /l/ vocalisation.

1.5. Global English

English has become an international language not only because it is used by so many people all over the world, but also because it has developed into the essential means of global communication, embracing access to the world's intellectual and technical resources. Crystal (2003) defines a global language as a language that "achieves a global status when it develops a special role that is recognised in every country" (2003: 3). Thus, English is often referred to as **Global English** or **World English** and is used as a lingua franca[1] in all spheres of global activity. No other language has such global exposure as English, which is used around the globe for specific purposes other than language. The term **World Englishes** embodies all varieties of English developed in different regions of the world, especially those that emerged in nations colonised by the UK or influenced by the US. Some scientists (e.g. Widdowson 1994) claim that the extensive number of people who now use English means that it is no longer the property of native speakers, which consequently results in the deprivation of the standard dialects and accents. Some scientists (e.g. Jenkins 2000) introduced the term **intelligible pronunciation** to define the extent of the phonological features of the language that make the message recognisable by a listener. Consequently, the pedagogical priorities in pronunciation are reduced to features necessary to adopt international intelligibility only. This course, however,

[1] A **lingua franca** is "a term used in sociolinguistics, and often in everyday speech, to refer to an auxiliary language used to enable routine communication to take place between groups of people who speak different native languages; also sometimes called an interlingua" (Crystal 2008: 282).

points the EFL university students in the direction of a near-native pronunciation – what Gimson calls the target of "high acceptability" (Cruttenden 2014: 328).

Further reading options: Roach (2009: 1-7)**,** Collins and Mees (2003: 2-6, 268-272), Trudgill (1999: 123-125).

Terminology check:
dialect, accent, sociolect, social community, idiolect, national variety, Standard English, RP, BBC English, Cockney, Estuary English, World English, World Englishes, intelligible pronunciation

Study questions:

1. What is the difference between a dialect and an accent?
2. What is a sociolect?
3. What is an idiolect?
4. What is the difference between SE and RP?
5. What are the different types of RP?
6. What are the different names for RP? Why are they called so?
7. What is the difference between RP, Cockney, and Estuary English?
8. What native dialect / accent do you speak?

2. PHONETICS AND PHONOLOGY

2.1. The Object of Phonetics and Phonology

Phonetics and phonology are the branches of linguistics concerned with sounds, thus the main object of investigation in this course is **a sound**. The English alphabet is comprised of 26 letters, while the sound system of English contains 44 sounds as phonemes (see explanation of phonemes below). Both branches investigate the sounds from different perspectives:

- **Phonetics** is concerned with the physical manifestation of language in sound waves and how they are produced, transmitted, and perceived, and also "provides methods for their description, classification, and transcription" (Crystal 2008: 363).
- **Phonology** "studies the sound systems of languages" (ibid: 365) and how sounds function in relation to each other in a language.

Although phonetics and phonology are indistinguishable from one another in most instances, the scope of these pages deal with phonetics essentially and only touches upon a few concepts in phonology for practical purposes.

2.2. On Phone, Phoneme, and Allophone

The term **sound** is often regarded as not being a precise one in the fields of phonetics and phonology and is thus replaced by the term **phone.** Sound could mean any noise or sound, while phone is restricted to the human voice ('Phone' comes from a Greek word 'phone' [human voice] and is regarded as a speech sound which can be cut out from the speech stream. Crystal (2008) defines phone as "the smallest perceptible discrete segment of sound in a stream of speech" (2008: 361).

A **phoneme** includes all the phonetic specifications of phones and is the smallest independent unit that can bring about a change in meaning. Roach (2009) calls phonemes "abstract sounds" as there may be slightly different ways to realise the same phoneme. An example of a phoneme is the sound /t/ in the words ***t****eam* and *s****t****eam*. The slight difference in the realisation of this phoneme is that the /t/ in ***t****eam*

is aspirated [tʰ], while the /t/ in *steam* is not [t]. Phones that belong to the same phoneme, such as [t] and [tʰ] for English /t/, are called **allophones**. Allophones do not affect the semantic meaning of the word, while a substituted phoneme could bring a semantic change. For example, ***t**eam* pronounced with any allophone of the phoneme /t/ maintains its meaning, but if it is substituted with the phoneme /b/, then it brings about a semantic change. These two words then (*team* /**t**i:m/ and *beam* /**b**i:m/) form a **minimal pair**, which is an opposition of two words showing the existence of these two phonemes. For a set of words to form a minimal pair, they may differ in one phoneme only. Phonemes cannot, in fact, be pronounced – in actual speech, they are realised through allophones.

2.3. The Branches of Phonetics

Adopting the different perspectives referred to in the description of phonetics above, it can be viewed as investigating three distinct areas that are represented in the following **branches of phonetics**:

- **articulatory phonetics**, which studies the ways the vocal organs are used to produce speech sounds;
- **acoustic phonetics**, which investigates the physical properties of speech sounds (duration, frequency, intensity, and quality) that are generally measured by spectrographs to depict waveforms and spectrograms;
- **auditory phonetics,** which is concerned with how people perceive speech sounds, i.e. how the sound waves activate the listener's eardrum, and how the message is carried to the brain in the form of nerve impulses.

Further reading options: Roach (2009: 31-38), Crystal (2008: 361-365).

Terminology check:
phonetics, phonology, phone, phoneme, allophone, minimal pair, articulatory phonetics, acoustic phonetics, auditory phonetics

Study questions:

1. What is the difference between phonetics and phonology?
2. What is the difference between a letter and a sound?
3. How many sounds are there in the English sound system?

4. What is the number of sounds and letters in your native language?
5. Why is phone a more appropriate term than sound?
6. What is the difference between phoneme and allophone?
7. What is a minimal pair?
8. What branches of phonetics are distinguished, and what does each branch investigate?

Exercises:

1. Write the number of letters and the number of sounds in these words:

Word	Number of letters	Number of sounds
enough		
philosophy		
Christmas		
answer		
furniture		
Chinese		
picturesque		
delicious		
Wednesday		
colonel		
honour		
thorough		
naughty		
scene		
business		

2. Create minimal pairs substituting the sounds in bold in the following words:

Word	Minimal pairs with that word								
let /**l**et/									
let /le**t**/									
kid /kɪ**d**/									
got /**g**ɒt/									
keen /**k**iːn/									
book /**b**ʊk/									
come /kʌm/									

3. SPEECH MECHANISMS IN ARTICULATORY PHONETICS

3.1. The Stages in Sound Production

For practical purposes, of the three main branches of phonetics, articulatory phonetics will be discussed as an enhanced awareness of the articulatory apparatus and the exact production of each sound can help students to form conscious and physically correct articulation. Articulatory phonetics focuses on the organs of speech and their role in producing speech sounds, which is predominantly based on data provided by other sciences, such as human anatomy and physiology. Human beings do not possess organs used exclusively in the production of speech sounds. Instead, these organs primarily serve other functions (digestive, respiratory, etc). This actually raises an interesting question: whether we were born to speak or whether speech developed accidentally in the evolution of mankind. Either way, the production of speech sounds happens either simultaneously or alternatively with the physiological processes mentioned above.

Speech is the result of neuromotor activity, thus the sound originates in the brain. After the creation of the message in the mind, a number of commands are executed by the organs of speech to physically produce the sound. The physical production initiates in the lungs and undergoes important modifications in the respiratory tract before it is realised. The different stages involved in this process are referred to as a **speech chain**. Clark and Yallop (1992) view this process as a kind of **speech mechanism** involving the active or passive functioning of the organs of speech. The stages in physical speech mechanism are presented in *Figure 1* and are listed as follows:

1. **Initiation or Respiration** (the lungs provide the energy source);
2. **Phonation** (the vocal folds convert the energy into an audible sound);
3. **The Oronasal Process** (the soft palate distributes the audible sound into the oral cavity or nasal cavity);
4. **Articulation** (the organs of speech transform the sound into an intelligible speech sound).

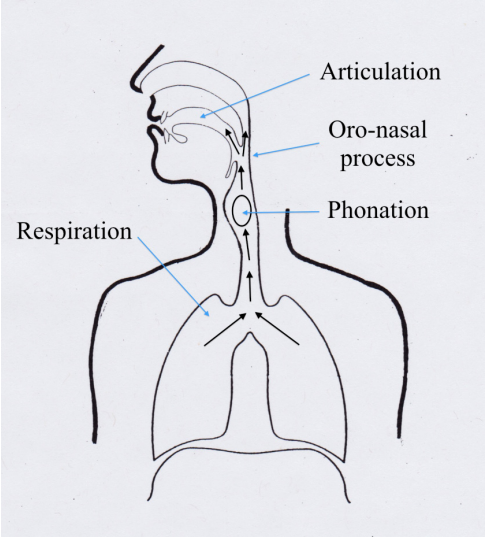


Figure 1. Stages in speech mechanism *(adapted from Roach 2009:25)*

3.2. Initiation or Respiration

The physical initiation process starts in the **lungs**. Clark and Yallop (1992: 21) describe the lungs as the "reservoir for airflow in much of speech". The lungs consist of spongy material that are filled with air when we inhale. The lungs are located in the thoracic cavity within the rib cage and are surrounded at the front by the ribs and at the ventral base by the diaphragm (see *Figure 2*). During the **inspiration** phase, the diaphragm lowers and the rib cage moves upwards and outwards, increasing the dimensions of the thoracic cavity and lowering the air pressure. This enlargement

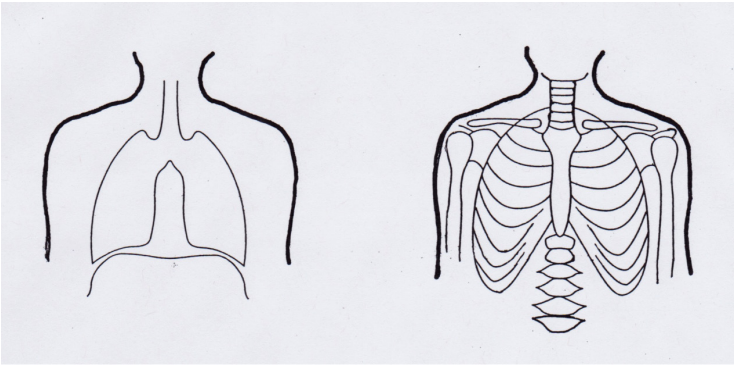


Figure 2. The lungs and the rib cage *(adapted from Roach 2009: 25)*

of the thoracic cavity increases the lung volume, which consequently allows air to flow into the lungs. In the **expiration** phase, the rib cage is pulled downwards and the lung volume is reduced, which in turn forces the airflow out of the lungs and generates an **egressive** airflow. It is during the latter phase that speech production takes place in English, and it is for this reason that the sounds produced are known as **egressive.**

3.3. Phonation

The airflow passes from the lungs into the vocal tract and then to the **larynx**. In the larynx, some of the essential features of the sound production take place as they contain the **vocal folds** (vocal cords). Clark and Yallop (1992) describe the larynx as a skeletal frame situated at the top of the trachea and made of a series of cartilages, with the two main cartilages (the thyroid and the cricoid) playing the crucial role in the process of phonation (see *Figure 3)*. Inside the thyroid cartilage, there is a so-called voice box, which consists of two plates joined together at an angle at the front. The vocal folds are two plates, or rather two thick flaps of tissue and are made of the so-called vocal ligament and a vocal muscle. At the back, the vocal folds are attached to a pair of arytenoid cartilages which move in rotational and sliding motions that shape the position of the vocal folds.

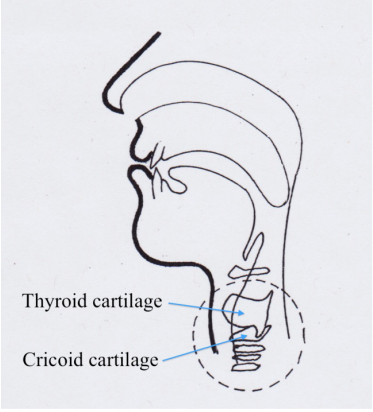


Figure 3. The larynx and the cartilages *(adapted from Roach 2009: 25)*

The vocal folds play a crucial role in one of the most important phonetic processes, which is that of **voicing**. The vocal folds can be brought together and when the airstream is forced between them, they vibrate and produce voice. When the vocal folds are wide apart, the airstream passes between them freely, meaning

that the vocal folds do not vibrate and no voice is produced. This position is set for breathing, so that air can pass in and out of the lungs unimpeded. The laryngeal aperture (or space) between the vocal folds is called the **glottis.** Clark and Yallop (1992: 32) characterise the glottal opening as being approximately 17 to 22 mm long in males and about 11 to 16 mm long in females. Vowels, vowel-like sounds (sonorants), and a number of consonants are produced by the vibration of the vocal folds, and consequently, they are defined as **voiced**. The open glottis with an absence of vibration in the vocal folds is characteristic for **voiceless** sounds. See *Figure 4* for the closing (a) and the opening (b) of the vocal folds.

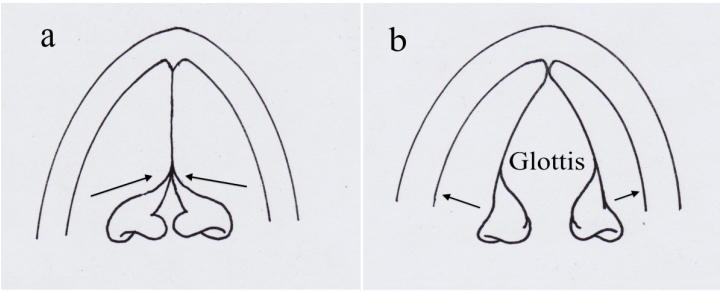


Figure 4. The closing and the opening of the vocal folds

Clark and Yallop (1992: 37) describe the **phonation cycle** in the following stages:

1. the vocal folds are drawn together fairly tightly;
2. the expiratory airflow builds up the pressure and forces the vocal folds apart;
3. as the airflow escapes through the glottis, the pressure is reduced, and the focal folds close again.

By varying the status of the vocal folds (more tense or relaxed, longer or shorter, higher or lower rate of vibration, etc.), we can change the quality of the voice (from loud to quiet, clear, harsh, creaky, etc.). Roach (2009: 25) identifies three basic differences in the **pressure** of the vocal folds as described below:

1. variation in **intensity** (loudness);
2. variation in **frequency** (high and low pitch);
3. variation in **quality** (harsh, breathy, creaky sounds).

Consequently, by manipulating the vocal folds in diverse ways, it is possible to distinguish various sets of categories generally referred to as the **modes of phonation**. Clark and Yalop (1992) recognise five main phonation modes as featured below in *Table 1*:

Table 1. **The modes of phonation** ***(adapted from Clark and Yallop 1992: 59-60)***

voiceless	the absence of any phonation, the airflow passes freely through the glottis;
voiced	the normal vocal fold vibration occurring along most or all the length of the glottis;
whisper	significant turbulence at the glottis, which is narrowed;
breathy voice	the normal vibration of the vocal folds accompanied by some continuous turbulent airflow, which occurs when glottal closure during the vibratory circle is not complete;
creaky voice	low frequency vibration of the vocal folds when the folds open for a very short time, often at irregular intervals.

3.4. The Oronasal Process

The next stage in sound production involves the airflow in the **upper vocal tract** and the configuration of the cavities through which it passes once it has left the larynx.

Clark and Yallop (1992: 42) describe the **pharynx** as a "tube of muscle shaped rather like an inverted cone". It lies between the larynx and the base of the skull and serves as a kind of crossroads between the upper respiratory system and the lower respiratory system, including the larynx. The pharynx functions as an air passage during breathing, and it branches into two cavities that act as resonators for the upward airflow: the **oral cavity** and the **nasal cavity**. The soft palate (velum) plays a significant role in the pharynx because it is the organ that directs the airflow into either of the two cavities. If the soft palate is raised, it closes the entrance to the nasal cavity and directs the air through the oral cavity (mouth) to produce **oral sounds** (see *Figure 5 (a)*). If the soft palate is lowered, the airflow is directed

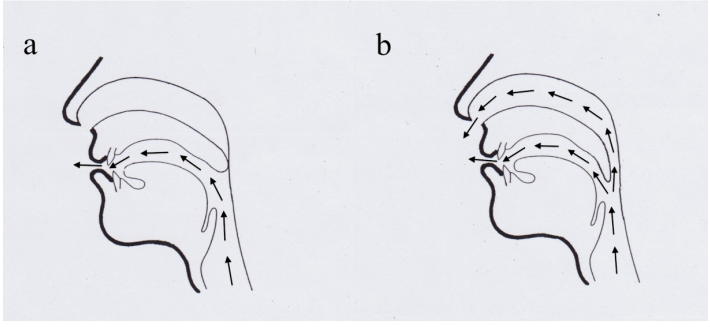


Figure 5. The production of oral and nasal sounds

through both cavities, escaping through the nostrils and mouth at the same time. During this pattern of airflow, the sounds produced are defined as **nasal sounds** (see *Figure 5 (b)*). The complex acoustic structure of the nasal cavity produces nasal sounds that sound relatively quiet as compared to oral sounds.

3.5. Articulation

After the initiation and phonation processes in the larynx and the pharynx, the audible sound is formed into a concrete sound with the help of the **organs of speech (articulators)** situated in the oral cavity. The main organs of speech are illustrated in *Figure 6* and are briefly described below.

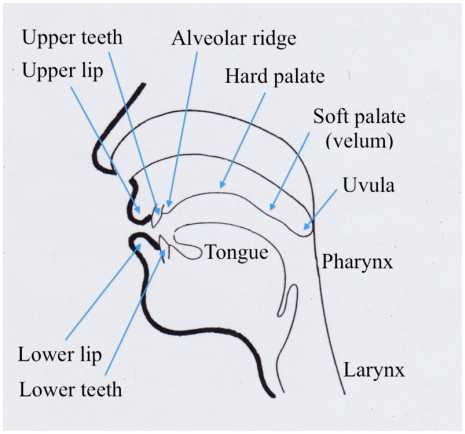


Figure 6. Organs of speech

The most important and flexible of all the organs of speech is the **tongue**, which is situated in the oral cavity and makes the greatest contribution to the articulation process. Gimson and Cruttenden (2008: 14) characterise it as "capable of assuming

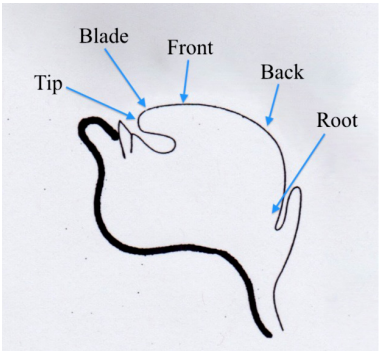


Figure 7. The subdivisions of the dorsum of the tongue

a great many varieties of positions of articulation for both vowels and consonants". The upper surface of the tongue, which comes into contact with other organs of speech is called the **dorsum**. For purposes of phonetic description, the dorsum is subdivided into several parts. Because there are no clear boundaries on the tongue itself, this division is somewhat arbitrary. The basic subdivisions of the dorsum are the **tip,** the **blade,** the **front,** the **back,** and the **root** as indicated in *Figure 7*.

The tongue comes into contact with several other articulators, which are either flexible and mobile or are stable and immobile. The **palate** is a smooth curved surface in the upper part of the mouth and consists of two parts: the **hard palate** and the **soft palate** or **velum** (with its pendent **uvula**). The hard palate is a stable articulator and is essential for the production of several consonants when in contact with the tongue. The soft palate and uvula are flexible and take place in the oronasal process of sound production. The **lips (upper and lower)** are quite mobile and may be shut or held apart to give a shape to the oral cavity. The **upper teeth** and **alveolar ridge** (located behind the upper teeth) are stable (immobile) articulators, while the **lower teeth** and **lower jaw** are mobile. Many organs of speech are located in the upper part of the oral cavity, a region deemed **the roof of the mouth** (*see Figure 8*) by Gimson and Cruttenden (2008: 13).

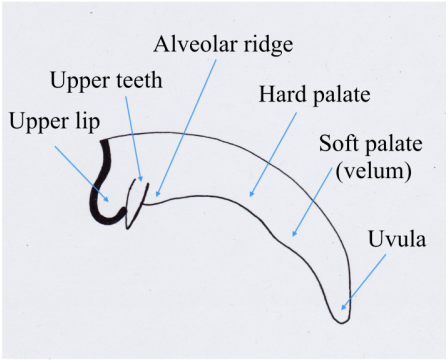


Figure 8. The roof of the mouth

From this discussion, we can see that numerous **organs of articulation** or **articulators** are involved either actively or passively in the production of speech, thus are referred to as active or passive (see Roach 2009a). The **organs of speech** are summarized in *Table 2*.

Although the organs of speech are universal in all people, the position and movements of the articulators differ for certain sounds. **Articulatory settings**, as

Table 2. **Active and passive organs of speech**

Active (flexible) organs of speech (because they can be moved into contact with other articulators)	
the lungs **the vocal folds** **the tongue** **the soft palate (velum)** **the uvula**	**the upper lip** **the lower lip** **the lower jaw** **the lower teeth**
Passive (stable) organs of speech (because they are stable (immobile) in sound production and their most important function is to act as the place of an articulatory stricture)	
the upper teeth **the alveolar ridge** **the hard palate**	**the pharynx** **the larynx** **the vocal tract**

defined by Collins and Mees (2003: 221), refer to "the overall way in which the speech organs (i.e. lips, tongue, mouth and throat muscles, velum, larynx) are held throughout the speech process". It is also worth noting that the settings vary not only between languages but also between different varieties of the same language. EFL learners typically find the acquisition of the articulatory settings of the English language to be the greatest challenge. However, working on these articulatory settings can often produce better results in pronunciation for EFL learners.

Further reading options: Roach (2009: 8-10, 22-24), Clark and Yallop (1992: 9-13, 21-25, 48-56), Collins and Mees (2003: 25-35, 221-225).

Terminology check:
articulatory phonetics, speech chain, initiation or respiratory stage, phonation, voicing, pressure of vocal folds, modes of phonation, glottis, oronasal process, articulation, active and passive organs of speech, the tongue, the roof of the mouth, articulatory settings

Study questions:

1. What stages are involved in sound production?
2. Why is the airflow in the initiation of the sound called egressive?

3. Why is the larynx an essential organ of speech?
4. Describe the phonation process in more detail.
5. Describe how the status of the vocal folds (tense vs relaxed, longer vs shorter, higher vs lower rate of vibration, etc.) is varied.
6. What process takes place in the pharynx, and what articulators are involved?
7. Which organs of speech are called active and which are called passive? What is the difference between an active and a passive articulator?
8. In what cavities does sound resonate?
9. Compare the articulatory settings of English with those of your native language

Exercises:

1. Slightly press two fingers against your throat and try to feel the vibration of vocal folds when you pronounce the sound /b/ and the absence of vibration when you pronounce /p/. Using the same method, decide whether the following sounds are voiceless or voiced:

The sound	Voiced/voiceless
/k/	
/g/	
/n/	
/z/	
/s/	
/r/	
/e/	
/f/	
/v/	

2. Imagine the work of your organs of speech and decide what sounds could be made when they act in the following ways:

Position of organs of speech	The possible sounds
Both lips shape an oval	
The lower lip nearly touches the upper teeth	
The tip of the tongue touches the alveolar ridge	
The lower jaw and the lower teeth are down, the mouth is wide open	
The back part of the tongue touches the hard palate	
The velum along with the uvula are down	

3. Decide which articulators are active and which are passive to produce the following sounds **/v/**, **/m/**, **/w/**, **/ʌ/**, **/n/**, **/e/**, **/k/**, **/h/**, **/ʊ/**, **/p/**:

Sounds	Active organ of speech	Passive organ of speech
/v/		
.		
.		

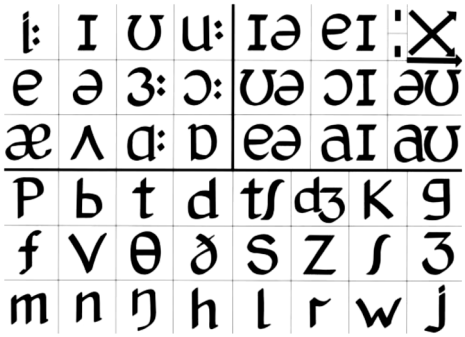
4. ENGLISH PHONEMES

4.1. The International Phonetic Alphabet and Transcription

Articulatory phonetics deals not only with the organs of speech but also with the categorisation and classification of the production features of phones. An extensive knowledge of how concrete vowels and consonants are articulated by particular organs of speech is essential for successful articulation.

There are 44 phonemes in English. **The English Phonemic Chart,** as presented by Underhill (1994) and given in *Table 3,* exhibits clear sets of vowels (monophthongs and diphthongs), consonants, and sonorants.

Table 3. **The English Phonemic Chart**



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The symbols for the English phonemic chart have been compiled from the **International Phonetic Alphabet (IPA)** devised by **International Phonetic Association** (also abbreviated **IPA**). The association was established in 1886, and since then, it has been functioning as the major as well as the oldest representative organisation for world phoneticians. The association's mission is to promote the scientific study of phonetics by providing phoneticians worldwide with a notational standard for the phonetic representation of all languages, i.e. the IPA. The alphabet

is based on the Latin letters and **diacritics** that indicate slight alterations to the usual value of phonetic symbols, e.g. [n̩] (meaning /n/ is syllabic). The latest version of the alphabet was published in 2005.

The term **transcription** refers to the process and "the methods of writing down speech sounds in a systematic and consistent way" (Crystal 2008: 490). Each sound must be identified and written in an appropriate symbol. Principally, there are two kinds of transcription: phonemic and phonetic transcription. **Phonemic transcription** gives only a basic idea of the sounds, and is thus often termed as **broad transcription**. It uses the 44 English phonemic symbols and does not show any phonetic details of the sounds. The symbols are enclosed in slashes / /, e.g. /t/; /taɪp/.

Phonetic transcription has a high degree of accuracy and shows a lot of articulatory and auditory details. It is often termed as the **narrow transcription** or **transcription proper** because it aims to represent actual speech sounds in the narrowest sense and uses additional diacritics. The symbols are therefore enclosed in square brackets [ ]. For example, [tʰ] means that /t/ is aspirated, and [spiːd̥] means that /d/ is a bit devoiced at final position.

4.2. Sound Classes: Vowels, Consonants, and Sonorants

Speech sounds are generally divided into two classes: vowels and consonants. Vowels are produced with a comparatively open vocal tract for the airflow to pass unimpeded. As a result, vowels are considered to be open sounds, whereas consonants are produced with a certain constriction in the vocal tract. Roach (2009a) gives the following characterisation of the sounds:

- **Vowel**s are the class of sounds that are associated with the least obstruction to the flow of air during their production.
- **Consonant**s are the class of sounds that are associated with obstructed airflow through the vocal tract during their production.

Vowels can also be distinguished from consonants as they display a different acoustic energy: vowels are highly resonant and intense and have greater sonority than do consonants. Vowels also have the function to be syllabic (a syllable can contain a minimum of one vowel), while consonants are units that function at the margins of syllables, either singly or in clusters, and are optional (see Section 8). Vowels typically involve the vibration of vocal folds, so they are voiced, while consonants split into voiced and voiceless forms.

A special set of consonants that demonstrate reduced levels of obstructed airflow during their production are called **sonorants (sonants, semivowels)**. According to Roach (2009):

- **Sonorants** are sounds that are voiced and do not cause sufficient obstruction to the airflow to prevent normal voicing from continuing.

A list of the **20 vowel phonemes** in English with word examples is given in *Table 4*:

Table 4. **Vowel phonemes**

/ɪ/	as in *sit*	**/eɪ/**	as in *may*
/iː/	as in *speak*	**/aɪ/**	as in *kite*
/ʊ/	as in *book*	**/ɔɪ/**	as in *toy*
/uː/	as in *tool*	**/ɪə/**	as in *near*
/ʌ/	as in *cup*	**/eə/**	as in *dare*
/ɑː/	as in *heart*	**/ʊə/**	as in *cure*
/ɒ/	as in *box*	**/əʊ/**	as in *cold*
/ɔː/	as in *door*	**/aʊ/**	as in *mouth*
/e/	as in *bed*		
/æ/	as in *cat*		
/ɜː/	as in *bird*		
/ə/	as in *ago*		

A list of the **17 consonant phonemes** in English with word examples is given in *Table 5*:

Table 5. **Consonant phonemes**

/p/	as in *pipe*	**/z/**	as in *zoo*
/b/	as in *be*	**/θ/**	as in *think*
/t/	as in *time*	**/ð/**	as in *that*
/d/	as in *do*	**/ʃ/**	as in *sure*
/k/	as in *car*	**/ʒ/**	as in *casual*
/g/	as in *go*	**/tʃ/**	as in *church*
/f/	as in *fine*	**/dʒ/**	as in *gin*
/v/	as in *vet*	**/h/**	as in *hat*
/s/	as in *sad*		

A list of the **7 sonorant phonemes** in English with word examples is given in *Table 6*:

Table 6. **Sonorant phonemes**

/m/	as in *map*
/n/	as in *nose*
/ŋ/	as in *king*
/l/	as in *love*
/r/	as in *red*
/j/	as in *yacht*
/w/	as in *wet*

Further reading options: Roach (2009; 2-3, 31-35), Underhill (1994: 5-7, 29-30).

Terminology check:
English Phonemic Chart, International Phonetic Association, International Phonetic Alphabet, diacritics, phonetic transcription, broad transcription, narrow transcription, vowel, consonant, sonorant

Study questions:

1. What are the responsibilities of the International Phonetic Association?
2. Compare the sonority in vowels, consonants, and sonorants.
3. How many vowels, consonants, and sonorants are there in your native language?
4. Which of the 44 English phonemes are not present in your native language? Compare and find similarities with the remaining phonemes.

Exercises:

1. Transcribe the vowel phonemes in the following words:

Word	Vowel	Word	Vowel
cup		*how*	
said		*hear*	
sea		*float*	
ash		*foot*	
blow		*first*	
glance		*dare*	
wash		*pool*	
sign		*cream*	
walk		*pill*	

2. Transcribe the consonant phonemes in the following words:

Word	Consonant	Word	Consonant
fee		*the*	
too		*palm*	
egg		*thin*	
show		*view*	
chew		*zoo*	
old		*massage*	
hair		*large*	

3. Transcribe the sonorant phonemes in the following words:

Word	Sonorant	Word	Sonorant
oil		*song*	
use		*knee*	
wave		*yolk*	
comb		*twelve*	
rice		*thumb*	

4. Spell out seven words for each of the 44 sounds.

No	Sound	Word examples						
1.								
.								
.								

5. CHARACTERISATION AND CLASSIFICATION OF VOWELS

The characterisation and classification of vowels is challenging. Clark and Yallop (1992) state that the quality of vowels depends on the size and shape of the tract, which can be modified using the tongue and the lips. The major challenge is to define the position of the tongue as it moves without forming any significant obstruction in the oral cavity. As a result, vowels are produced without any specific point of blockage. The other fundamental articulatory feature of vowels is determined by the shape and degree of protrusion of the lips.

5.1. The Cardinal Vowel Diagram

The cardinal vowel diagram devised by the IPA provides a set of reference points for the articulation and recognition of vowels. In the diagram, vowels are located on a four-sided figure, which in a way represents the shape of the tongue. Two dimensions of the diagram correspond to the positions of the tongue vertically and horizontally. The vertical axis represents tongue height, and the horizontal axis represents tongue fronting or advancement. The current diagram was systematised by D. Jones in the early 20th century, though the idea goes back to earlier phoneticians,

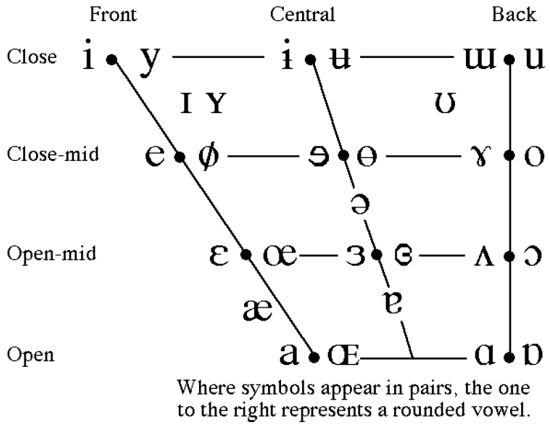

Figure 12. The cardinal vowel diagram *(reproduced by kind permission of the International Phonetic Association, see References)*

most notably A. J. Ellis and A. M. Bell. The cardinal vowel diagram illustrates the extremes of vowel quality that the vocal tract is able to produce, and thus the cardinal vowels are not the sounds of a particular language. Clark and Yallop (1992: 65) claim, that they "are best taken to be auditory qualities rather than articulatory specifications". Phoneticians recognise and articulate these artificial sounds so that they can describe all natural vowels in relation to the nearest cardinal vowel. The cardinal vowel diagram is given in *Figure 12*.

The characterisation of English vowels that follows will use the classification aspects of the cardinal vowel diagram.

5.2. The Height of the Tongue

The vertical movement of the tongue depicts the **height** of the body of the tongue and refers to how high or low the tongue is positioned in the mouth (see *Figure 11*). Carr (2013: 17-21) categorises the following groups of vowels in relation to the Cardinal Vowel Diagram:

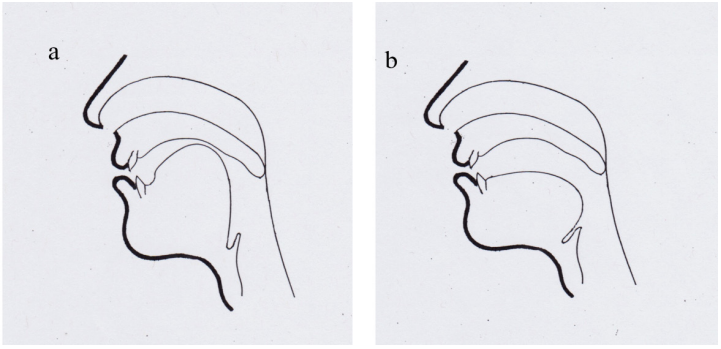

Figure 11. Vertical positions of the tongue

- **high** or **close** vowels articulated with the tongue located as high as possible in the oral cavity, thus narrowing the passage for the airflow: /ɪ/, /iː/, /ʊ/, /uː/;
- **mid** or **mid-open** vowels with the tongue lowered to the mid position in the oral cavity: /æ/, /ɒ/, /ʌ/, /ɑː/;
- **low** or **open** vowels produced with the tongue positioned as low as possible in order to leave a lot of space for the airflow: /e/, /ɔː/, /ɜː/, /ə/.

5.3. The Advancement of the Tongue

The horizontal movement of the tongue, or **tongue advancement** to the front position (see *Figure 10 a*) or back position (see *Figure 10 b*) is essential in forming the following groups of vowels as given by Carr (2013: 17-21):

- **front** vowels articulated with the tongue far forward in the oral cavity toward the hard palate: /iː/, /ɪ/, /e/, /æ/;
- **central or mixed** vowels produced with the tongue retracted to the middle position in the oral cavity: /ʌ/, /ɜː/, /ə/;
- **back vowels** produced with the tongue retracted as far as possible to shape the space in the front part of the oral cavity: /ɒ/, /ɔː/, /ʊ, /uː/, /ɑː/.

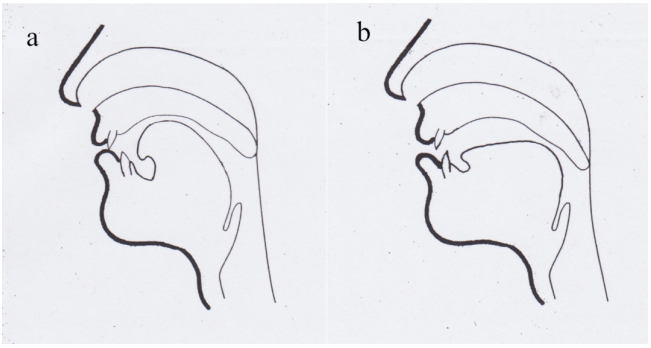

Figure 10. Horizontal position of the tongue

5.4. The Shape of the Lips

Vowels may also be different from each other with respect to the rounding and shaping of the lips necessary to enlarge or diminish the space within the mouth. The following sets of vowels are identified:

- **rounded** vowels**,** as the lips shape into a circle or a tube: /ʊ/, /uː/, /ɒ/, /ɔː/;
- **spread** vowels**,** as the corners of the lips are moved away from each other: /ɜː/, /e/, /iː/, /ɪ/, /æ/;
- **neutral** vowels, as the position of the lips is not noticeably rounded or spread: /ʌ/, /ɑː/, /ə/.

These various lip shapes are illustrated in *Figure 15*:

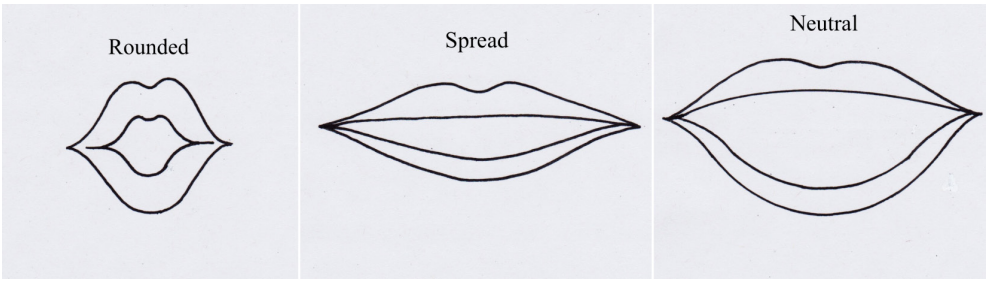

Figure 15. The shape of the lips *(adapted from Clark and Yallop 1992: 66)*

5.5. Tenseness and Length

According to the tenseness of the organs of speech, vowels are classified into one of two groups: **tense** and **lax**. Tense vowels are relatively higher and more marginal, while lax are shorter, lower, and slightly more centralised. Carr (2008: 175) claims that "tense vowels are articulated closer to the periphery of the vowel space and are typically longer than their lax counterparts". Of 12 English pure vowels, five are termed as **long** in duration: /ɑː/, /ɔː/, /iː/, /uː/, /ɜː/, and the remaining seven are termed as short in duration: /ʌ/, /ɔ/, /ɪ/, /ʊ/, /e/, /æ/, /ə/. The symbols for long vowels are followed by a **length mark** of two vertical dots. In addition, length seems to relate to several pairs of vowels:

/ɑː/ - /ʌ/ /ɔː/ - /ɔ/ /iː/ - /ɪ/ /uː/ - /ʊ/ /ɜː/ - /ə/

However, this is just a functional division. Phonology research shows that the length of vowels can only be contrasted in comparable contexts as there is no a clear-cut long/short distinction of one and the same vowel. An example of /iː/ and /ɪ/ having various lengths in centiseconds is illustrated in *Figure 13:*

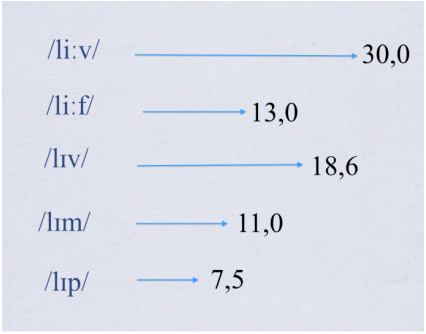

Figure 13. The length of vowels in contrasted contexts *(adapted from Gimson 1980: 98)*

The difference in length is normally accompanied by a difference in the sound quality. Thus, the members within a pair in length (e.g. /ɔː/ and /ɒ/) have slightly different positions concerning the height and advancement of the tongue. *Figure 14* displays English short and long vowels in the cardinal vowel diagram.

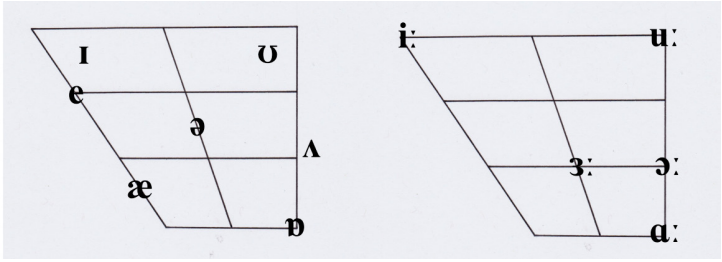

Figure 14. English short and long vowels in the cardinal vowel diagram

The /ə/ sound stands out from all other vowels and requires some further comment. It appears to be the shortest possible vowel, and in some forms of words, it is even omitted. It is known as the **schwa** (from Hebrew, meaning 'emptiness') or the **neutral vowel.** Furthermore, it is the most frequently occurring vowel in English, and it only appears in weak syllables, e.g. *across* /əˈkrɒs/, *character* /ˈkærəktə/.

Another remark should be made regarding the two intermediate sounds in the broad transcription: /i/ and /u/. These can be generally specified as **archiphonemes** because they represent the intermediate status between the phonemic contrasts in length in /iː/ and /ɪ/ as well as /uː/ and /ʊ/. This neutralisation of length suggests that the two sounds /i/ and / u/ have the quality of the respective long vowels and the length of the respective short vowels. Skandera and Burleigh (2011: 51) specify the following phonetic environments for the intermediate /i/:

- in word final position, e.g. *lucky* /ˈlʌki/;
- in prefixes like *re-*, *pre-*, and *de-* when followed by a vowel, as in *react* /riˈækt/, *deactivate* /diˈæktɪveɪt/;
- in suffixes like *-tal*, *-iate*, and *-ious* when they are pronounced as two syllables, e.g. *appreaciate* /əpriːʃieɪt/;
- in many function words (*he, she, we, me, be, the*, etc.) when followed by a vowel, e.g. *the air* /ði eə/.

The intermediate /u/ is much less common and usually occurs in unstressed syllables in these phonetic environments:

- in some function words (*you, to, into, do*, etc.) when followed by a vowel, e.g. t*o us* /tu ʌs/.
- before a vowel within a word, when they are pronounced as two syllables, e.g. *eventually* /ɪˈventʃuəli/, *evacuate* /ɪˈvækjueɪt/ (ibid: 51)

5.6. Diphthongs and Triphthongs

So far, the discussion has characterised pure vowels with a single perceived auditory quality, which are known as **monophthongs**. Such vowels remain constant in their articulation process and do not glide. There are 12 monophthongs in English: /ɪ/, /iː/, /ʊ/, /uː/, /ʌ/, /ɑː/, /ɒ/, /ɔː/, /e/, /æ/, /ɜː/, /ə/.

Diphthongs are vowels in which two vowel qualities can be perceived, and the articulators move from the production of one vowel to the other. The first part of the diphthong is longer and stronger than the second and is often referred as to the **nucleus** of the diphthong. The second part is just a **glide** whose full formation is generally not accomplished. The quality of the phoneme reduces to quite short and decreases in loudness. The organs of speech only move toward the articulation of the glide, but they are not set to pronounce it fully. The total number of diphthongs is eight: /eɪ/, /aɪ/, /ɔɪ/, /ɪə/, /eə/, /ʊə/, /əʊ/, /aʊ/. Diphthongs are usually grouped into the following three categories, depending on the height and advancement of the tongue:

- the diphthongs that glide toward the vowel /ə/ in the centre of the oral cavity are known as **centring to /ə/**: /ɪə/, /eə/, /ʊə/;

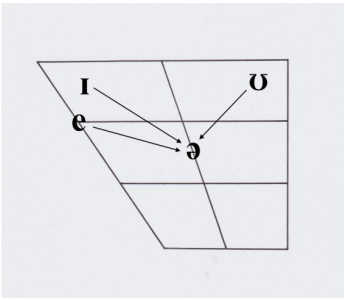

Figure 16. Centring diphthongs in the cardinal vowel diagram

- the diphthongs that glide toward a higher position in the mouth to reach the close sound /ɪ/ are known as **closing to /ɪ/**: /eɪ/, /aɪ/, /ɔɪ/;

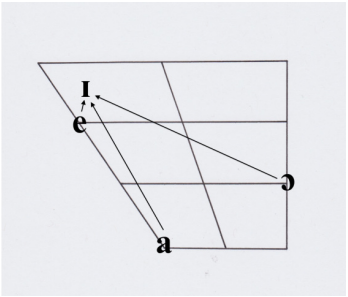

Figure 17. Closing to /ɪ/ diphthongs in the cardinal vowel diagram

- the diphthongs that glide toward a higher position in the mouth to reach the sound /ʊ/ and are known as **closing to /ʊ/**: /əʊ/, /aʊ/.

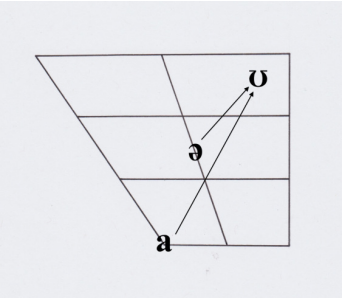

Figure 18. Closing to /ʊ/ diphthongs in the cardinal vowel diagram

There are also **triphthongs** – the most complex type of vowels. These are sounds in which three vowel qualities can be perceived as they glide from one vowel to another and then to a third. Roach (2009: 19) describes triphthongs as "composed of the five closing diphthongs […] with a schwa added on the end". The five examples of triphthongs are given below:

Table 7. **Triphthongs in English**

/eɪə/	as in *player*
/aɪə/	as in *fire*
/ɔɪə/	as in *lawyer*
/əʊə/	as in *lower*
/aʊə/	as in *our*

Further reading options: Roach (2009: 13-19), Gimson and Cruttenden (2008: 35-39), Collin and Mees (89-118), Carr (2013: 17-21).

Terminology check:
the cardinal vowel diagram, the height of the tongue, the advancement of the tongue, tenseness, length, schwa, the shape of the lips, monophthongs, diphthongs, nucleus, glide, triphthongs

Study questions:

1. According to what aspects are vowels classified?
2. Describe the characteristics of the vowels according to the movement of the tongue.
3. What does the cardinal vowel diagram represent?
4. Explain the relationship between tenseness and length of English vowels?
5. What quality do vowels have as monophthongs, diphthongs, and triphthongs?

Exercises:

1. Give the characteristics of the twelve pure vowels in the chart below:

No.	Sound	Tenseness	Length	Shape of the lips	Position of the Tongue	
					Height	Advancement
1.						
.						

2. Spell out 7 words for each of the 5 triphthongs.

No.	Sound	Word examples						
1.								
.								

6. CHARACTERISATION AND CLASSIFICATION OF CONSONANTS

All consonants have certain properties in common that identify them from vowels. There are 24 consonants in English, although seven of them are referred to as sonorants because they share several features (sonority and continuation) with vowels: /m/, /n/, /ŋ/, /l/, /r/, /j/, /w/. The pure 17 consonants are narrowed to the term **obstruents** because the airflow is always obstructed to a great extent when the sounds are articulated: /p/, /b/, /t/, /d/, /k/, /g/, /f/, /v/, /s/, /z/, /θ/, /ð/, /ʃ/, /ʒ/, /tʃ/, /dʒ/, /h/.

Sonorants function in the English language the same way as consonants, and both groups of sounds have a lesser or greater obstruction of the airflow. Therefore, it is customary to attach sonorants to the class of consonants. Consonants can be described in terms of the location of the constriction, the manner of the constriction, and the type of phonation it supports (see Clark and Yallop 1992: 76). In short, consonants are classified by **place, manner,** and **voicing** as detailed below.

6.1. The Place of Obstruction

In the classification system for consonants, "place" denotes the location or place of obstruction and the active organ of speech involved in the articulation stage of the production of the consonants. Clark and Yallop (1992: 79) list the following groups of consonants in which various tongue positions are combined with various locations:

- **bilabial** sounds are produced with the upper and lower lips pushed together (see *Figure 19*): /p/, /b/, /m/, /w/;

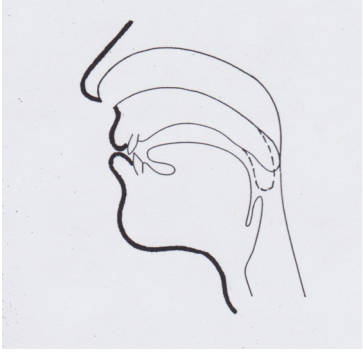

Figure 19. Bilabial sounds

- **labio-dental** sounds are articulated with contact between the lower lip and the upper teeth (see *Figure 20*): /f/, /v/;

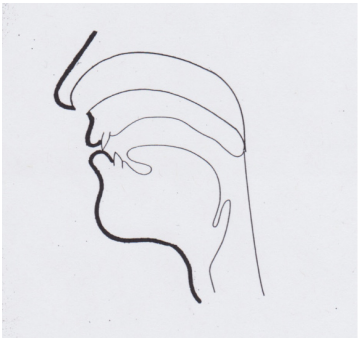

Figure 20. Labiodental sounds

- **apico-dental** sounds are generated with the tip of the tongue protruded between the lower and the upper teeth (see *Figure 21*): /θ/, /ð/;

Figure 21. Apicodental sounds

- **apico-alveolar** sounds are made by advancing the tip of the tongue toward the alveolar ridge (see *Figure 22*): /t/, /d/, /n/, /l/, /s/, /z/;

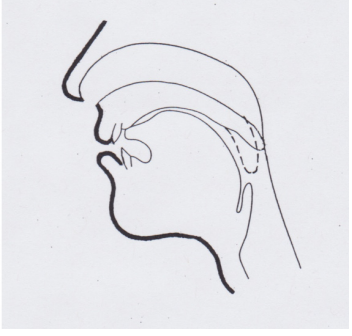

Figure 22. Apico-alveolar sounds

- **lamino-alveolar** sounds are produced by raising the blade of the tongue toward the alveolar region (see *Figure 23*): /ʃ/, /ʒ/, /tʃ/, /dʒ/;

Figure 23. Lamino-alveolar sounds

- **apico-postalveolar** sound is made by upturning the tip of the tongue behind the alveolar ridge (see *Figure 24*): /ɾ/;

Figure 24. Lamino-alveolar sounds

- **lamino-palatal** sounds are pronounced by advancing the blade of the tongue toward the highest part of the hard palate (see *Figure 25*): /j/;

Figure 25. Lamino-palatal sounds

- **velar** sounds are made as the tongue body makes contact with the soft palate (see *Figure 26*): /k/, /g/, /ŋ/;

Figure 26. Velar sounds

- **glottal** sound is produced by the narrowing of the glottis as the wall of the pharynx makes contact with the root of the tongue (see *Figure 27*): /h/.

Figure 27. Glottal sounds

6.2. The Manner of Obstruction

The **manner of obstruction** is concerned with the degree or extent of the obstruction and the way in which it is formed in the vocal tract (see Clark and Yallop 1992: 81). The variables range from total closure of the vocal tract to nearly open. When the obstruction totally blocks the airflow, it is called a complete or **occlusive** obstruction**.** The obstruents and sonorants with this type of obstruction are classified under one of two terms:

- **plosive obstruents:** /p/, /b/, /t/, /d/, /k/, /g/**;**
- **nasal sonorants**: /m/, /n/, /ŋ/.

In the production of the plosive obstruents, the air is obstructed and then released with a small burst of noise (plosion). They are also defined as **stops** because they cannot be prolonged. The following organs of speech form the full closure: lips pressed together for /p/, /b/; the tip of the tongue pressed against the alveolar ridge for /t/, /d/; and the body of the tongue pressed against the velum for /k/and /g/**.** Nasal sonorants have a stoppage at some point in the oral cavity, and the velum is lowered for the air to escape through the nasal cavity.

When the closure is not quite complete, it is called **constrictive**. The air either escapes through a narrow passage and makes a hissing sound for obstruents, or it penetrates through the sides of the obstruction and escapes rather freely through the nasal or oral cavity for sonorants. The following sounds are produced with constriction:

- **fricative obstruents**: /f/, /v/, /s/, /z/, /θ/, /ð/, /ʃ/, /ʒ/, /h/;
- **constrictive sonorants**: /l/, /r/, /j/, /w/.

Clark and Yallop (1992: 83) differentiate between fricatives and approximants by comparing the degree of the constriction. In the production of fricatives, the constriction is narrowed to generate turbulent airflow. The turbulence results in a sound with a hissing or sibilant quality. Moreover, fricatives are all continuant consonants: they can be continued for a long time. Approximants have an articulation in which the constriction is not great enough to cause turbulence, so the airflow penetrates in higher volume. Some phoneticians (e.g. Collins and Mees 2003) subdivide the approximants into lateral /l/ and medial /r/, /j/ and /w/ to demonstrate the escape of the airflow via the rims of the tongue and the middle of the tongue, accordingly.

A few sounds are generated with a double-sided obstruction, which may be defined as **occlusive-constrictive**. Affricates are the two sounds that are produced in this manner: /tʃ/, /dʒ/. The initial complete closure of the plosive sounds /t/ and /d/ is released through a constriction for the fricative sounds /ʃ/ and /ʒ/. In addition, the two affricates are **homorganic**, which means that the place of articulation of the plosive is the same or nearly the same as that of the paired fricative.

6.3. Voicing

All the consonants are subclassified as either **voiced** or **voiceless**. At the phonation stage, the vocal folds are in tight contact for the production of voiced consonants, while the air for voiceless consonants passes through the glottis with vocal folds set apart. All the sonorant sounds are voiced. *Table 8* presents the list of voiced and voiceless consonants and sonorants:

Table 8. **Voiced and voiceless consonants and sonorants**

Obstruents		Sonorants
Voiced	**Voiceless**	**Voiced**
/b/	**/p/**	**/m/**
/d/	**/t/**	**/n/**
/g/	**/k/**	**/ŋ/**
/v/	**/f/**	**/l/**
/z/	**/s/**	**/r/**
/ʒ/	**/ʃ/**	**/j/**
/ð/	**/θ/**	**/w/**
/dʒ/	**/tʃ/**	
	/h/	

According to the force of articulation or energy with which they are articulated and perceived, consonants are subdivided into relatively strong (**fortis)** or relatively weak (**lenis;** see Roach 2009: 28). English voiced consonants are lenis, whereas English voiceless consonants are fortis. The latter seem to be pronounced with a stronger muscular tension and breath force. For example, compare *pow* /**p**aʊ/ and *bough* /**b**aʊ/. The force of articulation is not easy to define and measure, however some phoneticians prefer to use the terms fortis and lenis rather than the terms voiceless and voiced.

6.4. Articulation of the Plosive Consonants

Roach (2009: 26) details the articulation of the plosive consonants and describes them as starting with **the closing phase** when articulators are pushed together to form a complete closure behind which the air will be trapped. During the **holding phase**, the vocal tract is completely closed. Air cannot escape through the nose because the soft palate is raised. However, the lungs are still forcing the air out of the vocal tract, so the pressure behind the closure builds up. Finally, in the **release phase,** a plosion takes place, allowing the air trapped behind the closure to escape. Because of the pressure, this release generates a burst of noise.

Further reading options: Roach (2009: 26-30, 39-55), Underhill (1994: 29-47), Clark and Yallop (1992: 83-88).

Terminology check:
obstruents, bilabial, labiodental, apicodental, apico-alveolar, lamino-alveolar, apico-postalveolar, lamino-palatal, velar, glottal, occlusive, constrictive, occlusive-constrictive, plosive, fricative, affricate, homorganic, nasal sonorant, lateral approximant, medial approximant, fortis, lenis

Study questions:

1. Why are consonants termed as obstruents?
2. What are the basic features that characterise consonants?
3. What are the various types of obstructions?
4. How do plosives differ from fricatives?
5. How are approximants subdivided?
6. Why are affricates called homorganic sounds?
7. Describe the phases in the production of plosive sounds.

Exercises:

1. Divide each of the following groups of phonemes into sets of three that share common characteristics. The first set is done as an example.

Group of phonemes	Set 1		Set 2	
	Phonemes	Characteristic feature	Phonemes	Characteristic feature
/p/ /m/ /t/ /n/ /k/ /ŋ/	/p/ /t/ /k/	plosive obstruents	/m/ /n/ /ŋ/	nasal sonorants
/s/ /l/ /p/ /m/ /v/ /ʃ/				
/r/ /f/ /j/ /s/ /w/ /ʃ/				
/k/ /g/ /l/ /s/ /n/ /z/				
/t/ /k/ /d/ /s/ /g/ /z/				
/ʒ/ /ð/ /t/ /z/ /k/ /g/				

2. Give the characteristics of consonants and sonorants in the chart below. The first sound is done as an example.

Sound	Voice	Place	Manner		Consonant
/p/	voiceless	bilabial	occlusive	plosive	obstruent
.					
.					

7. ABOVE THE SEGMENTAL LEVEL: ALLOPHONES AND THEIR CONTEXTS

Up to this point in the course, phonemes have been described as phonetic segments as if they existed in isolation and did not affect one another. However, speech production is not a series of isolated events. Instead, it is a complex chain of events, with the organs of speech operating independently and many fine adjustments being made as we speak. As a consequence, allophones are used for actual speech production, and they have different **distribution,** i.e. occupy different **contexts** and **environments**.

7.1. Pre-Fortis Clipping

Clipping is the process of "the reduction of duration of sonorous sounds when followed in the same syllable by a fortis consonant" (Ashby and Maidment 2005: 197). This type of reduction generally affects vowels. In return, a clipped vowel is pronounced quicker when it is located next to a voiceless consonant. Compare the following minimal pairs:

rice /raɪs/ (with clipped /aɪ/) and *rise* /raɪz/

sit /sɪt/ (with clipped /ɪ/) and *seat* /si:t/

7.2. Aspiration

The plosive voiceless (fortis) sounds /p/, /t/, /k/, after they are released, undergo a post-release phasein which the sounds are followed by a brief additional puff of air. Cruttenden (2014: 164) defines the post-release phase as "a voiceless interval consisting of strongly expelled breath between the release of the plosive and the onset of the following vowel". This special feature of articulation is termed **aspiration,** and the plosives are said to be **aspirated**. The IPA diacritics for aspiration are transcribed as a superscript: [ʰ]. The degree and duration of aspiration depend on the context of the sound. Aspiration is the strongest in the initial position of a syllable, e.g. *type* [tʰaɪp], in the initial position of a stressed syllable, e.g. *potato* [pə'tʰeɪtəʊ], and before a long vowel or a diphthong, e.g. *keep* [kʰi:p].

Aspiration is lost when a fricative sound (usually /s/) follows the voiceless plosives (see Cruttenden 2014: 164). Compare the following pairs of words with the strongest level of aspiration in the first word and absence of aspiration in the second one:

team [tʰiːm] and *steam* [stiːm]
tone [tʰəʊn] and *stone* [stəʊn]
Kate [kʰeɪt] and *skate* [skeɪt]
cold [kʰəʊld] and *scold* [skəʊld]

7.3. Palatalised /l/

The term **palatalisation** refers to a process by which a sound, usually a consonant, is articulated with the tongue shifted near the hard palate (see Crystal 2008: 347). The sound /l/ can be realised as a palatalised allophone with the tongue slightly raised toward the palate. This allophone is called **clear /l/,** and it occurs before vowels (e.g. *light, love*). The nonpalatalised allophone, the **dark/l/,** is realised in other contexts: before consonants and in the final positions of words (e.g. *milk, ball*). It has a special allophonic symbol [ɫ]. However, palatalisation is highly dependent on the dialectal use that is specific to RP speakers. In several nonstandard varieties of English, the dark /l/ may be articulated like a vowel or a sonorant: /w/, /ɒ/ or /ʊ/, e.g., *milk* /mɪʊk/ or *feel* /fiːw/. This is called **/l/ vocalisation** and is a notable feature of Cockney and Estuary English.

7.4. Allophonic Release of the Plosives

In certain contexts, the six plosive sounds are released in a different manner as they acquire the features of their neighbouring sounds (see Roach 2009a for each type of the release below). A plosive sound followed by another plosive sound seems to have **no audible release**, which is typically referred to as **loss of plosion** or incomplete plosion. In the IPA, this allophonic realisation of the consonants is denoted with a diacritic in the upper right corner [t̚], e.g. *expect* [ɪkˈspek̚ t], *dog bite* [ˈdɒg̚ baɪt].

Nasal plosion (nasal release) occurs when a plosive sound is followed by a nasal sound. The release of the plosive sound happens by lowering the soft palate so that air escapes through the nose. The plosive sound becomes nasalised, and the whole process is referred to as **nasalisation** (see Roach, 2009a). The plosive and the nasal are homorganic because they share the same place of articulation. The special

diacritic is a small [ⁿ] symbol above the sound as in [tⁿ], e.g. *goodnight* [gʊdⁿ naɪt], *black magic* [blækⁿ ˈmædʒɪk].

L**ateral plosion** (lateral release) takes place when the compressed air for the production of a plosive sound is released by lowering the sides of the tongue before the lateral sound /l/. The plosive sound becomes lateralised, and the process is called **lateralisation,** which is indicated by a vertical line as in [tˡ], e.g. *plosive* [ˈpˡləʊsɪv], *lightly* [ˈlaɪtˡli].

A glottal release of several plosives is widely found in contemporary English pronunciation. This is termed as a **glottal stop** or **glottalisation**. Instead of the plosive articulation, a complete closure is made at the glottis to cause a period of silence, which is very typical of the sound /t/. The symbol for glottal stop is /ʔ/, e.g. bottle /bɒʔl/; *water* /wɔːʔə/. The glottal closure may occur immediately before plosive sounds at the end of a syllable, which is typical of the plosives /p/ /t/ /k/ and the affricate /tʃ/, e.g.:

butter /ˈbʌtə/ or /ˈbʌʔtə/
atmospheric /ætməsˈferɪk/ or /æʔtməsˈferɪk/
accurate /ˈækjərət/ or /ˈæʔkjərət/
teaching /ˈtiːtʃɪŋ/ or /ˈtiːʔtʃɪŋ/

7.5. Treatment of /ŋ/

The nasal /ŋ/ needs to be discussed separately because this is a sound that often causes problems for EFL students. Roach (2009: 47) gives a thorough explanation on the distribution of the sound. The /ŋ/ sound is never found in the initial position of a syllable or a word. In the medial position, /ŋ/ is always followed by the plosive /k/ if the word has *–nk-* in spelling, e.g. *think* /θɪŋk/ or *banknote* /ˈbæŋknəʊt/. The difficulty starts when /ŋ/ is expected to be followed by the sound /g/ in the words with *–ng- in* spelling. When /ŋ/ occurs at the end of a morpheme (at the end of a minimal unit of meaning), /g/ is not present, e.g. *sing* (root) + *er* (suffix) /ˈsɪŋə/. When /ŋ/ occurs in the middle of a morpheme, it is followed by the plosive /g/, e.g. *finger* /ˈfɪŋgə/, *anger* /ˈæŋgə/.

There are exceptions, however. The main exception to the morpheme-based rule is the pronunciation of /ŋ/ in comparative and superlative forms of adjectives and adverbs: even when /ŋ/ occurs at the end of a morpheme, it is pronounced /ŋg/ when it is followed by the comparative suffix *-er* or the superlative suffix *–est*, e.g. *longer* /ˈlɒŋgə/, *longest* /ˈlɒŋgəst/.

7.6. Treatment of /r/

The approximant /r/ is another case to be considered, as its articulation and distribution are not the same in different accents of English. Most British accents like RP are **non-rhotic,** which means that speakers exclude the sound /r/ before a consonant or in final positions of words before a prosodic break. Meanwhile, **rhotic accents** generally realise /r/ in all contexts, e.g. General American. Accordingly, in the following examples of words in RP, the sound /r/ is not pronounced:

car /kɑː/
ever /ˈevə/
nurse /nɜːs/
farm /fɑːm/
stairs /steəz/

7.7. Treatment of Final /s/, /z/ and /ɪz/

Many students often confuse /s/ and /z/ sounds at the end of words when, in spelling, they write *–s*. This is essentially relevant for the plural forms of nouns, the possessive case of nouns, and the third person singular form of verbs. Actually, there are three types of endings, and they are determined by the voice quality of the preceding sound as presented in *Table 9*:

Table 9. **Treatment of final /s/, /z/, and /ɪz/** ***(adapted from Celcia-Murcia et al 2007: 248)***

/s/	after voiceless consonants	*books, roofs, aunt's, wife's, month's, stops, writes*
/z/	after voiced consonants and vowels	*sons, songs, walls, heroes, dog's, pupil's, goes*
/ɪz/	after /s/ /z/ /ʃ/ /ʒ/ /tʃ/ /dʒ/	*churches, languages, judge's, actress's, teaches*

7.8. Treatment of Final /t/, /d/, and /ɪd/

The past form of regular verbs in spelling *–ed* may be pronounced as /t/, /d/, or /ɪd/, which is again determined by the voice quality of the preceding sounds (see *Table 10*):

Table 10.* Treatment of final /t/, /d/, and /ɪd/ *(adapted from Celcia-Murcia et al 2007: 252)

/t/	after voiceless consonants	*looked, missed, passed, baked, crossed*
/d/	after voiced consonants and vowels	*played, served, appeared, spammed, bottled*
/ɪd/	/t/ /d/	*hated, started, wanted, speeded, voted, loaded*

The allophones and their contexts described in the section are the objects of investigation in suprasegmental phonetics. When combined, sounds are often affected by the neighbouring environment and undergo various modifications Because the scope of this course is generally limited to segmentals, just a few allophonic realisations have been discussed.

Further reading options: Roach (2009: 46-51), Cruttenden (2014: 163-164), Ashby and Maidment (2005: 197).

Terminology check:
distribution, clipping, aspiration, palatalisation, clear /l/, dark /l/, /l/ vocalisation, loss of plosion, nasal plosion, lateral plosion, glottalisation, glottal stop, non-rhotic accent

Study questions:

1. Why is the distribution of allophones important?
2. How does a voiceless consonant affect a preceding vowel?
3. What three environments are necessary for the strongest level of aspiration?
4. In what context is /l/ palatalised?
5. How is glottal stop different from glottal reinforcement?
6. In what cases is the sound /ŋ/ followed by the plosive /g/?
7. What does the term **non-rhotic accent** mean?
8. Under what influence is the *–s* ending in the plural of nouns pronounced in three different ways?

Exercises

1. Give minimal pairs showing the existence of a clipped and unclipped vowel.

Minimal pair		Minimal pair	
Clipped vowel	Unclipped vowel	Clipped vowel	Unclipped vowel

2. Underline the plosive sounds that may have the strongest level of aspiration in the given environments:

/fənˈtæstɪk/	/ˈpəʊites/	/kəmˈpeə/	/riˈkɔːl/	/priˈkɔːʃəs/	/ˈtəʊtəlaɪz/	/kəmˈpəʊnənt/

3. Which of the following words are pronounced with clear /l/ and which are pronounced with dark /l/?

Word	Clear /l/ / dark /l/
alphabet	
meal	
bell	
glow	
especially	
milk	
social	
glare	
stumble	
familiar	

4. How are the plosive sounds released in the following words and phrases?

Word / phrase	Loss of plosion / nasal plosion / lateral plosion
bad man	
respect	
nutmeg	
blackleg	

big lad	
big man	
bed covers	
glow	
kidnap	

5. Which of the following words are pronounced with /ŋ/ and which are pronounced with /ŋg/: ***England, strongest, ringer, anger, anguish, banging, hanger, jingle, mongoose, Tango, younger, bungalow, angriest, angry, finger, dangle, language, hungriest.***

/ŋ/	/ŋg/

6. Complete this chart by writing the sound that correctly ends each of these words:

Word	/s/ /z/ /ɪz/	Word	/t/ /d/ /ɪd/
inventions		*placed*	
professors		*allotted*	
coughs		*characterised*	
pronounces		*mentioned*	
matches		*pronounced*	
cultures		*remembered*	
Spencer's		*suggested*	
chocolates		*crusaded*	
Mary's		*computed*	
Gimson's		*argued*	
examples		*flowered*	
entertains		*frightened*	
manages		*masked*	
devotes		*accomplished*	
saves		*bleached*	
attaches		*annoyed*	

8. THE SYLLABLE

8.1. The Structure of the Syllable

The syllable may be defined as an uninterrupted unit of utterance that is typically larger than a single sound and smaller or equal to a word, e.g. *see* /siː/, *simplify* /ˈsɪm.plɪ.faɪ/ (Crystal 2008: 467). In English, a **minimum syllable** is formed by a single vowel, e.g. *are* /ɑː/, *or* /ɔː/. Longer syllables have one or more consonants preceding or following the vowel, e.g. *meet* /miːt/, *consonant* /ˈkɒn.sə.nənt/.

Phonologically, the syllable is "a unit of phonological organisation whose central component is a nucleus, which is normally a vowel, and which may be preceded or followed by consonants" (Carr 2008: 171). The vowel in the centre of the syllable is called the **syllable nucleus,** and the optionally surrounding consonants or sonorants are defined as **margins**. The initial margin is the **onset**, whereas the final margin is called the **coda**. See *Figure 28*:

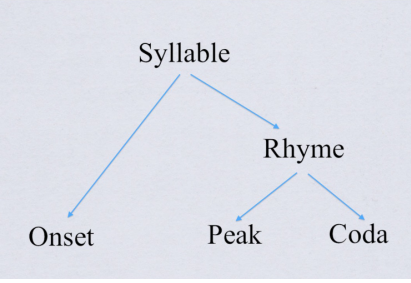

Figure 28. The syllable structure *(adapted from Roach 2009: 60)*

Some syllables have **syllabic sonorants** as their nucleus. Words like *bottle* /ˈbɒtl/, *trouble* /ˈtrʌbl/, *pigeon* /ˈpɪdʒn/, *often* /ˈɒfn/ are formed by two syllables, though they do not have a vowel as the nucleus. Instead, sonorants may serve the function of the nucleus, and in these positions, they are noted with a small vertical diacritics underneath the symbol, e.g. /ˈtrʌb̩/, /ˈpɪdʒn̩/. The typical syllabic sonorants are /l/ and /n/, yet /r/, /m/, and /ŋ/ can also acquire syllabic positions, especially under the influence of some processes in connected speech. If distributed in word final position

or if preceded by a vowel, sonorants do not count as syllabic. Compare the following examples:

sadden /sædn̩/ – *sand* /sænd/
doesn't /dʌzn̩t/ - *don't* /dəʊnt/

The division of words into syllables is referred to as **syllabification** or syllabication, which helps to distinguish between **monosyllabic, disyllabic**, **trisyllabic** and **polysyllabic** words according to the number of syllables they possess.

Syllables are often defined as **strong** or **weak** (see Roach 2009: 64). The strong syllables are relatively longer, more intense, and different in quality as they appear in stressed positions of a word (see section on Word Stress). The weak syllables contain either /ə/, /i/ or /u/ and are never stressed. Syllabic sonorants are also counted as forming weak syllables.

The **transcription** of monosyllabic words is very straightforward. It involves the recognition of concrete sounds and relating them to their phonemic symbols. Monosyllabic content words represent strong syllables only and may hold any phonemes, except for /ə/, /i/ or /u/. Function words, however, may be realised in strong and weak syllables (see Section 9). The usefulness of transcription is undeniably important as it enables the learners to extract precise information on the pronunciation of any word from a dictionary.

8.2. Word Stress

Syllabification is closely connected with the accentual structure of words, which is known as the **word stress** or **lexical stress.** In transcription, a superscribed vertical line appears before the stressed syllable, e.g. *never* /ˈnevə/, *agree* /əˈgriː/. Every disyllabic or polysyllabic word is pronounced with one or more syllables emphasized more than the remaining syllables in the word. Stress is usually equated with the notions of **emphasis** and **strength,** as the stressed syllables seem to be pronounced

Table 11. **The prominence characteristics of stressed and unstressed syllables** (adapted from Roach 2009: 74)

	Loudness	**Vowel length**	**Vowel quality**	**Pitch**
Stressed syllables	loud	long	strong	high
Unstressed syllables	quiet	short	weak	low

with more effort than unstressed ones. Clark and Yallop (1992: 295) say that this emphasis is "signalled by pitch as well as by supporting factors, notably loudness and duration". Roach (2009: 73) defines it as a **prominence** that is determined by four main factors: loudness, vowel length, vowel quality and pitch. In *Table 11* the stressed syllables are opposed to unstressed ones:

8.2.1. Levels of Stress

In some words it is possible to determine a second, weaker, stressed syllable as contrasted to the syllable holding the **primary stress**. This is considered to be the **secondary stress** and is notated by subscripting a low vertical line before the stressed syllable, e.g. pronunciation /prəˌnʌnsiˈeɪʃn/. There is also a third level of stress that is regarded by Roach (2009: 75) as '**unstressed'** and is characterised by the weak prominence factors mentioned above. It should be noted, however, that the syllables containing weak vowels /ə/, /i/, /u/ or a syllabic sonorant will sound even less prominent then the unstressed syllable with any other vowel. Consider the relative prominence of the first syllable in these words:

poetic /pəʊˈetɪk/ the first syllable is more prominent;
pathetic /pəˈθetɪk/ the first syllable is less prominent.

8.2.2. Placement of Stress

The position of the stress determines the different types of it as described below. In many languages, word stress is fairly predictable, i.e. it is determined by rules that apply to the majority of entries in the vocabulary. These languages are said to have **fixed stress**. However, languages with **free stress** have a vocabulary for which stress placement is difficult to predict. English is a free stress language. Moreover, free word stress may be either **constant** (remaining on the same syllable in different word class or in different derivatives from the same root, e.g. ***won**der, **won**derful, **won**derfully*) or **shifting** (varying between the syllables, e.g. ***pro**verb, pro**ver**bial*).

Although English is a free stress language, it is possible to predict the stress placement according to the following information as indicated in Roach (2009: 76): the syllable number in the word, the phonological structure of the syllable, the grammatical category of the word, and the morphological structure of the word. The basic stress patterns are given in the tables below, but there are exceptions, thus learners should treat each single case individually.

Syllabification is one of the factors that support the prediction of stress placement. *Table 12* presents the context when the stress is influenced by strong and weak syllables.

Table 12. **Stress patterns according to syllabification** ***(adapted from Roach 2009: 77-78)***

Disyllabic words	**Nouns**	Stress on the first syllable	*object*	/ˈɒbdʒekt/
			speaker	/ˈspiːkə/
			center	/ˈsentə/
	Verbs	Stress on the final syllable (if the final syllable is strong)	*arrange*	/əˈreɪndʒ/
			release	/rɪˈliːs/
			admit	/ədˈmɪt/
		Stress on the first syllable (if the final syllable is weak)	*fasten*	/ˈfɑːsn̩/
			open	/ˈəʊpən/
			answer	/ˈɑːnsə/
	Adjectives	Stress on the final syllable (if the final syllable is strong)	*polite*	/pəˈlaɪt/
			discrete	/dɪˈskriːt/
			correct	/kəˈrekt/
		Stress on the first syllable (if the final syllable is weak)	*lovely*	/ˈlʌvli/
			fatal	/ˈfeɪtl̩/
			shabby	/ˈʃæbi/
Trisyllabic words	**Nouns**	Stress on the first syllable	*chocolate*	/ˈtʃɒklət/
			paragraph	/ˈpærəgrɑːf/
			emperor	/ˈempərə/
		Stress on the second syllable (if the first syllable is weak)	*confusion*	/kənˈfjuːʒn̩/
			potato	/pəˈteɪtəʊ/
			behaviour	/bɪˈheɪvjə/
	Verbs	Stress on the final syllable (if it is strong)	*entertain*	/ˌentəˈteɪn/
			disconnect	/ˌdɪskəˈnekt/
			resurrect	/ˌrezəˈrekt/
		Stress on the preceding final syllable (**penultimate**) (if the final syllable is weak)	*remember*	/rɪˈmembə/
			acknowledge	/əkˈnɒlɪdʒ/
			determine	/dɪˈtɜːmɪn/
		Stress on the first syllable (if the final and the preceding final syllables are weak)	*motivate*	/ˈməʊtɪveɪt/
			monitor	/ˈmɒnɪtə/
			celebrate	/ˈseləbreɪt/
	Adjectives	Stress on the first syllable	*insolent*	/ˈɪnsələnt/
			positive	/ˈpɒzɪtɪv/
			shimmering	/ˈʃɪmərɪŋ/

Another important factor in stress determination is the **morphological structure** of the words. Some suffixes and prefixes in complex words may influence the level of stress (see *Table 13*).

Table 13. **Stress patterns according to suffixes** ***(adapted from Roach 2009: 83-84)***

Self-stressed suffixes (carry the primary stress themselves)	*-ee*	*refugee*		/ˌrefjʊˈdʒiː/	
	-eer	*engineer*		/ˌendʒɪˈnɪə/	
	-ese	*Portuguese*		/ˌpɔːtʃʊˈgiːz/	
	-ette	*kitchenette*		/ˌkɪtʃɪˈnet/	
	-esque	*sculpturesque*		/ˌskʌlptʃəˈresk/	
Neutral suffixes (do not affect stress placement)	*-able*	*knowledge*	/ˈnɒlɪdʒ/	*knowledgeable*	/ˈnɒlɪdʒəbl̩/
	-ous	*continue*	/kənˈtɪnjuː/	*continuous*	/kənˈtɪnjʊəs/
	-age	*cover*	/ˈkʌvə/	*coverage*	/ˈkʌvərɪdʒ/
	-al	*rebut*	/rɪˈbʌt/	*rebuttal*	/rɪˈbʌtəl/
	-er	*advertise*	/ˈædvətaɪz/	*advertiser*	/ˈædvətaɪzə/
	-ate	*affection*	/əˈfekʃn̩/	*affectionate*	/əˈfekʃənət/
	-en	*threat*	/θret/	*threaten*	/ˈθretn̩/
	-ful	*wonder*	/ˈwʌndə/	*wonderful*	/ˈwʌndəfəl/
	-ess	*steward*	/ˈstjʊəd/	*stewardess*	/ˌstjʊəˈdes/
	-hood	*like*	/ˈlaɪk/	*likelihood*	/ˈlaɪklɪhʊd/
	-man	*business*	/ˈbɪznəs/	*businessman*	/ˈbɪznəsmæn/
	-like	*child*	/tʃaɪld/	*childlike*	/ˈtʃaɪldlaɪk/
	-less	*power*	/ˈpaʊə/	*powerless*	/ˈpaʊəlɪs/
	-ish	*fool*	/fuːl/	*foolish*	/ˈfuːlɪʃ/
	-ly	*hurried*	/ˈhʌrɪd/	*hurriedly*	/ˈhʌrɪdli/
	-ment	*acknowledge*	/əkˈnɒlɪdʒ/	*acknowledgment*	/əkˈnɒlɪdʒmənt/
	-ness	*discursive*	/dɪˈskɜːsɪv/	*discursiveness*	/dɪˈskɜːsɪvnəs/
	-ous	*poison*	/ˈpɔɪzn̩/	*poisonous*	/ˈpɔɪzənəs/
	-fy	*glory*	/ˈglɔːri/	*glorify*	/ˈglɔːrɪfaɪ/
	-ship	*relation*	/rɪˈleɪʃn̩/	*relationship*	/rɪˈleɪʃnʃɪp/
	-some	*burden*	/ˈbɜːdn̩/	*burdensome*	/ˈbɜːdnsəm/
Influencing suffixes (influence stress in the stem)	*-al*	government	/ˈgʌvənmənt/	*governmental*	/ˌgʌvn̩ˈmentl̩/
	-eous	advantage	/ədˈvɑːntɪdʒ/	*advantageous*	/ˌædvənˈteɪdʒəs/
	-graphy	photograph	/ˈfəʊtəgrɑːf/	*photography*	/fəˈtɒgrəfi/
	-ate	origin	/ˈɒrɪdʒɪn/	*originate*	/əˈrɪdʒəneɪt/
	-ic	climate	/ˈklaɪmət/	*climatic*	/klaɪˈmætɪk/
	-ion	transport	/træns ˈpɔːt/	*transportation*	/ˌtrænspɔːˈteɪʃn̩/
	-ious	injure	/ˈɪndʒə/	*injurious*	/ɪnˈdʒʊərɪəs/
	-ity	banal	/bəˈnɑːl/	*banality*	/bəˈnæləti/
	-ive	*prospect*	/prəˈspekt/	*prospective*	/prəˈspektɪv/
	-nda	*agent*	/ˈeɪdʒənt/|	*agenda*	/əˈdʒendə/

Most **compounds words** have two stresses: primary and secondary. Depending on how compounds function in the sentence, the following stress patterns are found (see *Table 14*):

Table 14. **Stress patterns in compounds** ***(adapted from Roach 2009: 85-86)***

Compound nouns	General rule	Primary stress on the first element, secondary stress on the second element	*wristwatch*	/ˈrɪstˌwɒtʃ/
			swimming pool	/ˈswɪmɪŋ ˌpuːl/
			goldfish	/ˈgəʊldˌfɪʃ/
	If the first element is an ingredient of the second element	Primary stress on the second element, secondary stress on the first element	*apple pie*	/ˌæpl ˈpaɪ/
			strawberry milkshake	/ˌstrɔːbri ˈmɪlkʃeɪk/
			chicken bouillon	/ˌtʃɪkɪn ˈbuːjɒn/
			beef stew	/ˌbiːf ˈstjuː/
	Except compounds ending in cake, juice or water	Primary stress on the first element, secondary stress on the second element	*chocolate cake*	/ˈtʃɒklət ˌkeɪk/
			lemon juice	/ˈlemən ˌdʒuːs/
			rosewater	/ˈrəʊz ˌwɔːtə/
Compound adjectives	General rule	Primary stress on the second element, secondary stress on the first element	*blue-eyed*	/ˌbluː ˈaɪd/
			open-minded	/ˌəʊpən ˈmaɪndɪd/
			kindhearted	/ˌkaɪnd ˈhɑːtɪd/
	If the first element is a noun	Primary stress on the first element, secondary stress on the second element	*homesick*	/ˈhəʊm ˌsɪk/
			handmade	/ˈhænd ˌmeɪd/
Compound verbs		Primary stress on the second element, secondary stress on the first element	*overboil*	/ˌəʊvə ˈbɔɪl/
			underestimate	/ˌʌndəˈrestɪmeɪt/
			outrun	/ˌaʊtˈrʌn/

8.2.3. Stress in Word Class Pairs

There are words with identical spelling that represent different parts of speech. These words are differentiated by means of **shifting of the stress**. A small group of words for which the noun is differentiated from a verb by stress without a change in sound quality, e.g.:

increase /ˈɪnkriːs /, Noun, whereas *increase* /ɪnˈkriːs/, Verb
insult /ˈɪnsʌlt/, Noun, whereas *insult* /ɪnˈsʌlt /, Verb
impress /ˈɪmpres/, Noun, whereas or *impress* /ɪmˈpres/, Verb

Next follows another group of words for which the shifting of the stress may or may not be accompanied by a change in the quality of the vowel in the unstressed syllable of the verbs, e.g.:

transport /ˈtrænspɔːt/, Noun, whereas *transport* /trænˈspɔːt/ or /trənˈspɔːt/, Verb
torment /ˈtɔːment/, Noun, whereas *torment* /tɔːˈment/ or /təˈment/, Verb

Finally, there is a large group of words for which the shifting of the stress is accompanied by a change in the quality of the unstressed vowel, e.g.:

combine /ˈkɒmbaɪn/, Noun, whereas *combine* /kəmˈbaɪn/, Verb
conduct /ˈkɒndʌkt/, Noun, whereas *conduct* /kənˈdʌkt/, Verb
contrast /ˈkɒntrɑːst/, Noun, whereas *contrast* /kənˈtrɑːst/, Verb

There are also quite a few nouns that can form compounds but that can also be used like adjectives to make phrases with other nouns. When they constitute a compound, the main stress is placed on the first element. If they function as a phrase, the second element acquires the main stress (see Carr 2013: 86). Consider the following examples:

a blackboard /ˈblækbɔːd/ as a compound noun;
a black board /ˌblæk ˈbɔːd/ as an adjective and noun.

8.2.4. Stress Shift

When the change in stress placement is caused by the context, this is known as **stress shift** (Roach, 2009a). When a polysyllabic word with a stress placed at the end of it is followed by another word with the stress placed in the beginning of it, there is a tendency for the stress in the first word to shift towards the beginning, especially if it has a syllable that is capable of receiving stress, e.g.:

Japanese /ˌdʒæpəˈniːz/, but a *Japanese student* /ˈdʒæpəˌniːz ˈstjuːdnt/

Further reading options: Roach (2009: 56-68, 82-88), Crystal (2008: 467), Cruttenden 2014: (51-54).

Terminology check:
minimum syllable, the syllable nucleus, margins, onset, coda, syllabic sonorants, syllabification, monosyllabic, disyllabic, trisyllabic, polysyllabic, word stress, primary stress, secondary stress, fixed stress, free stress, constant stress, stress shift

Study questions:

1. What is the structure of an English syllable?
2. What is the meaning of the term syllabification?
3. Why is English called a free stress language?
4. What are the levels of stress?
5. What factors may help predict word stress in English?
6. How are word class pairs with identical spelling stressed and pronounced?
7. Under what circumstances does stress shift happen?

Exercises:

1. Transcribe these monosyllabic words:

Word	Transcription	Word	Transcription
Comb		*Choose*	
Last		*Month*	
Feel		*Year*	
Rose		*Quick*	
Bug		*Sword*	
Pack		*Hear*	
Gloves		*Laugh*	
Short		*Large*	
Long		*Five*	
Chair		*Write*	
Want		*Back*	
One		*Hold*	
Three		*Rude*	
Six		*Young*	
Town		*Use*	
Watch		*Joke*	
Age		*Front*	
Worm		*How*	
Warm		*Air*	
Walk		*Fire*	
News		*Wife*	
Phone		*Teeth*	
Next		*Voice*	
Quite		*File*	
Thanks		*Foot*	

Please		*Shoes*	
Kiss		*Check*	
Oil		*John*	
Half		*Jeep*	
Worse		*Chain*	
Wood		*Jazz*	
Twelve		*Bridge*	
Lunch		*Word*	
Thumb		*Chop*	
Each		*French*	
Taught		*Cheese*	
Though		*Cash*	
Bank		*Ash*	
Clothes		*Wage*	
Know		*Says*	
Corn		*Draw*	
Wrong		*Both*	
Wash		*Shelf*	

2. Transcribe the following polysyllabic words:

Word	Transcription	Word	Transcription
Capital		*Apply*	
Picture		*Pleasure*	
Support		*Sentence*	
Additional		*Dictionary*	
Ballad		*Personnel*	
Dramatic		*Future*	
Prefer		*Ordinary*	
Popular		*Philology*	
Particular		*Ability*	
Knowledge		*Learner*	
Affirm		*Command*	
Attempt		*Authentic*	
Activity		*Trainer*	
Teacher		*Register*	
Parents		*Number*	
Nature		*Traditional*	
Approach		*Historically*	
Personal		*Volume*	

Confidence		*Significant*	
Capacity		*Material*	
Example		*Perform*	
Interesting		*Student*	
Practice		*Yesterday*	
Difficult		*Telephone*	
Available		*Happens*	
Separately		*Customer*	
Alone		*Passenger*	
Unit		*Envelope*	
Edition		*Architect*	
Trouble		*Structural*	
Garden		*Brackets*	
Lovely		*Minimal*	
Careful		*Attention*	
Spelling		*Purpose*	
Money		*Surprise*	
Hospital		*Together*	
Husband		*Forever*	
Comfortable		*Another*	
Village		*Energy*	
Perhaps		*Exercise*	
Author		*Expression*	
Leather		*Statement*	
Clothing		*Atmosphere*	
Polite		*Component*	
Computer		*Produce*	
Remember		*Develop*	
Catastrophe		*Generate*	
American		*Translation*	
Important		*Family*	
Entrance		*Circus*	
Appreciate		*Twisters*	
Answer		*Memorable*	
Wonderful		*Although*	
Vegetable		*Feature*	

3. First underline the primary and secondary stresses in these words and then transcribe them.

Word	Transcription	Word	Transcription
Intonation		*Entertainment*	
Pronunciation		*Generation*	
Examination		*Fragmentation*	
Intermediate		*Cooperation*	
Capitalization		*Homogeneous*	
Photographic		*Application*	
Congratulations		*Topicality*	
Understand		*Transportation*	
Acquisition		*Volunteering*	
Opportunities		*Workaholic*	
Education		*Evolution*	
University		*Proportionality*	
Comprehension		*Illumination*	
Supplementary		*Particularisation*	
Punctuation		*Organisational*	
Lexicology		*Normalisation*	
Orthographic		*Neurological*	
Orientation		*Moralistic*	
Obligation		*Mineralogist*	
Acceleration		*Memorisation*	
Accommodation		*Legibility*	
Composition		*Hemispheric*	
Characterisation		*Harmonisation*	
Civilisation		*Gubernatorial*	
Capitalistic		*Guarantee*	
Enthusiastic		*Futurology*	

4. Decide what function the compounds serve in the sentence and transcribe the compounds according to the proper stress pattern:

Word	Function	Transcription	Word	Function	Transcription
Secondhand			*Overreact*		
Post office			*Movie star*		
Childlike			*Fall apart*		
Keyboard			*Undergo*		
Duty-free			*Colour-blind*		

Well-mannered			*Whitehouse*		
Turn away			*Shortsighted*		
Makeup			*Break-through*		
Make up			*Fall apart*		
Notebook			*Olive oil*		
Air-conditioned			*Handmade*		
Bedroom			*Seasick*		
Teapot			*Haircut*		
Look forward			*Toothpaste*		
Windscreen			*Waterproof*		
Trouble-free			*Quick-tempered*		
Update			*Tennis shoes*		
Tongue-tied			*Trainspotting*		
Middle-aged			*Upgrade*		
Outrun			*Software*		
Passer by			*English-speaking*		
Blacklist			*Washing machine*		
Car wheel			*Far-reaching*		
Brightly-lit			*Open-minded*		
Time-saving			*Underworld*		
Well-behaved			*Old-fashioned*		
Sun-dried			*Downsize*		
Long-lasting			*School-teacher*		

9. STRONG AND WEAK FORMS IN RELATION TO SENTENCE STRESS

9.1. Content Words and Function Words

Up to this point in the course, stress patterns have been attached to words in isolation. Stress operates at the word level and at the sentence level. In natural connected speech, however, not all words are stressed. Traditionally, the main meaningful words (those that carry the main semantic content) are stressed, while the other words that convey minor information in sentences are not stressed. The meaningful words, i.e. those that have an independent meaning and refer to a thing, an event, a property, etc. are called **content words,** and they include nouns, verbs, adjectives and adverbs. As opposed to content words are function words that have no or very little lexical meaning and are usually not stressed. They convey only grammatical information and express various grammatical relations. Depending on whether they are stressed or unstressed, the function words have several pronunciations. There are approximately 50 function words in English, including auxiliary verbs, prepositions, conjunctions, particles, etc. Typically, when they are unstressed, they are pronounced in their **weak form.** However, in some rare contexts, they can be stressed and appear in their **strong form**.

9.2. Reduction

The weak form is also often referred to as the **reduced form** because it is generally distinguished from the strong form of the word and undergoes the process of reduction. **Reduction** is the process that affects the quality and quantity of the sound. Thus, depending on the character of the change, reduction may be purely quantitative, qualitative, or zero. The reduction is called **quantitative** when it affects the length of sounds, e.g. *me* /miː/ to /mɪ/. The reduction is called **qualitative** when the vowel changes its quality to a neutral sound, e.g. *can* /kæn/ to /kən/. **Zero realisation** or **elision** is the process when sounds are elided, e.g. *of* /əv/ to /v/ (see Roach 2009: 113). *Table 15* presents the most common English function words in their strong and weak form:

Table 15. **Strong and weak forms of function words** ***(adapted from Collins and Mees 2003: 239-241)***

Function word	Strong form	Weak form
Determiners		
the	/ðiː/	/ði/ (before vowels)
		/ðə/ (before consonants)
a	/eɪ/	/ə/
an	/æn/	/ən/
some	/sʌm/	/səm/
Pronouns		
his	/hɪz/	/(h)ɪz/
him	/hɪm/	/(h)ɪm/
her	/hɜː/	/(h)ə/
you	/juː/	/ju/ (before vowels)
		/jə/ (before consonants)
your	/jɔː/	/jə/
she	/ʃiː/	/ʃi/
he	/hiː/	/(h)i/
we	/wiː/	/wi/
me	/miː/	/mi/
them	/ðem/	/ðəm/
us	/ʌs/	/əs/
who	/huː/	/(h)u/
that	/ðæt/	/ðət/
Prepositions and Particles		
then	/ðen/	/ðən/
at	/æt/	/ət/
for	/fɔː/	/fə/
from	/frɒm/	/frəm/
of	/ɒv/	/əv/
into	/ˈɪntuː/	/ˈɪntu/ (before vowels)
		/ˈɪntə/ (before consonants)
through	/θruː/	/θru/
to	/tuː/	/tu/ (before vowels)
		/tə/ (before consonants)
as	/æz/	/əz/
there	/ðeə/	/ðə/
Conjunctions		
and	/ænd/	/ənd/ /ən//n̩/
but	/bʌt/	/bət/

that	/ðæt/	/ðət/
than	/ðæn/	/ðən/
or	/ɔ:/	/ə/
Auxiliary verbs		
can	/kæn/	/kən/
could	/kʊd/	/kəd/
have	/hæv/	/(h)əv/
has	/hæz/	/(h)əz/
had	/hæd/	/(h)əd/
will	/wɪl/	/wɪl/ /l/
shall	/ʃæl/	/ʃəl/ /ʃl̩/
should	/ʃʊd/	/ʃəd/
would	/wʊd/	/wəd/
must	/mʌst/	/məst/ /məs/
do	/du:/	/du/ (before vowels)
		/də/ (before consonants)
does	/dʌz/	/dəz/
be	/bi:/	/bi/
been	/bi:n/	/bin/
am	/æm/	/əm/
are	/ɑ:/	/ə/
is	/ɪz/	/ɪz/
		/z/ /s/ (in contracted forms)
was	/wɒz/	/wəz/
were	/wɜ:/	/wə/

Strong forms of function words are rare, however, they may appear if the speaker intentionally emphasises the function words. The following environments usually require the use of strong forms:

- when in isolation, as in: *Who?* /hu:/;
- when being quoted, as in: *he said "of", not "off"* /ov/;
- at the end of a phrase or sentence, as in: *What are you looking for?* /fɔ:/;
- as the first of two consecutive auxiliary verbs without a full verb, as in: *would have liked* /wʊd/;
- in coordinations, as in: *he travels to and from London* /tu:/, /frɒm/;
- in contrasts, as in: *a message from John, not for John* /frɒm/, /fɔ:/;
- when used to emphasise a particular aspect of the message, as in: *Paris is the love city* /ði:/.

Further reading options: Roach (2009: 89-96), Collins and Mees (2003: 239-241).

Terminology check:
content word, function word, strong form, weak form, reduced form, reduction, qualitative reduction, quantitative reduction, elision

Study questions:

1. What words are typically stressed in a sentence?
2. How are function words realised under the stress influence?
3. What environments may determine the use of strong forms of the function words?

Exercises:

1. Choose 15 function words and write short sentences for their realisation in strong and weak forms:

Function word	Strong form	Weak form
.		
.		

2. Stress and transcribe the following sentences:

After about an hour, I managed to catch a bus.
Could you keep the secret until we get to our homes?
Don't lose your temper if Ann forgets to come.
I want a pound of sugar for making jam.
Look at the shop windows on the corner of the street.

Say that over and over again to make me feel better and better.
The airplanes are landing every two minutes, making a terrible noise.
There were a lot of people in the room who wanted to stay.
There is nothing better for a cold than a cup of hot tea with honey and lemon.

A LIST OF ABBREVIATIONS

EFL	English as a Foreign Language
SE	Standard English
RP	Received Pronunciation
EE	Estuary English
BBC	The British Broadcasting Corporation
IPA	International Phonetic Alphabet
IPA	International Phonetic Association

A GLOSSARY WITH LITHUANIAN EQUIVALENTS

Below is provided a glossary that uses Lithuanian equivalents as described by Bacevičiūtė (2008), Aprijaskytė and Pažūsis (1994), to help explain the key terms and complex anatomy concepts.

accent	tartis, akcentas arba kirtis
acoustic	akustinis
active organ of speech	aktyvus kalbos padargas
affricate	afrikata, priebalsinis dvigarsis
allophone	alofonas, fonemos variantas
alveolar ridge	alveolės, dantenos
apical (apico)	apikalinis, liežuvio galiuko kliūtinis
apico-alveolar	liežuvio priešakinis alveolinis
apico-dental	liežuvio priešakinis dantinis
apico-post alveolar	liežuvio pirešakinis užalveolinis
archiphoneme	tarpinis garsas
articulatory	artikuliacinis
articulatory settings	artikuliacinė bazė
arytenoid cartilage	vedeginė kremzlė
back vowel	užpakalinės eilės balsis
bilabial	abilūpinis
blade of the tongue	priešakinė liežuvio dalis
central vowels	vidurinės eilės balsiai
clipping	trumpinimas
coda	skiemens pabaigos garsas

consonant	priebalsis
constrictive	ankštumos
cricoid cartilage	žiedinė kremzlė, gerklų pagrindas
diacritics	diakritikas, žymėjimas
dialect	dialektas
diphthong	dvibalsis
distribution	distribucija, galimų pozicijų visuma
dorsum of the tongue	liežuvio nugarėlė
egressive	sudaromas iškvėpimo metu
expiration	iškvėpimas
flaps of muscle	raumenų audinių lopai
fortis	stiprusis
fricative	pučiamasis
front vowel	priešakinės eilės balsis
glide	slankas, antrasis dėmuo
glottal	glotalinis, ryklinis
glottalisation	ryklinis garso tarimas
glottis	balsaskylė, tarpas tarp balso stygų
hard palate	kietasis gomurys
high vowel	aukštutinio pakilimo balsis
homorganic	homorganinis, tariamas toje pačioje vietoje
initiation	iniciacija, garso sudarymo pradžia
inspiration	įkvėpimas
labio-dental	lūpinis dantinis
laminal (lamino)	liežuvio priešakinis
lamino-alveolar	liežuvio priešakinis alveolinis
lamino-palatal	liežuvio priešakinis gomurinis
larynx	gerklos

lateral	liežuvio šoninis
lenis	silpnasis
low vowel	vidutinio pakilimo balsis
lower jaw	apatinis žandikaulis
lungs	plaučiai
medial	liežuvio vidurinis
mid-open vowel	žemutinio pakilimo balsis
monophthong	vienbalsis
monosyllabic	vienskiemenis
nasal cavity	nosies ertmė
nasality	nosinimas, tarimas nosies ertmėje
nostrils	šnervės
nucleus	branduolys, pagrindinis elementas
obstruction	kliūtis
obstruent	kliūtinis garsas
occlusive	uždarumos
occlusive-constrictive	uždarumos-ankštumos
onset	skiemens pradžios garsas
oral cavity	burnos ertmė
oronasal	procesas burnos ir nosies ertmėje
palatalisation	minkštinimas
passive organ of speech	pasyvus kalbos padargas
pharynx	ryklė
phonation	fonacija, garso susidarymas
phone	kalbos garsas
phoneme	fonema
plates of vocal folds	balso stygų klostės
plosive	sprogstamasis

polysyllabic	daugiaskiemenis
primary stress	pagrindinis kirtis
qualitative reduction	kokybinė redukcija
quantitative reduction	kiekybinė redukcija
resonator	rezonatorius, ertmė, kurioje formuojasi garsas
respiratory	respiracinis, kvėpuojamasis
rims of the tongue	liežuvio šonai
root of the tongue	liežuvio šaknis
rounded vowel	lūpinis balsis
secondary stress	šalutinis kirtis
shifting stress	nepastovus kirtis
soft palate	minkštasis gomurys
sonorant	sonantas, pusbalsis
sonority	balsingumas
syllabic	skiemeninis
syllabification	skiemenavimas
syllable nucleus	skiemens centras
thyroid cartilage	skydinė kremzlė
tip of the tongue	liežuvio galiukas
tongue	liežuvis
trachea	trachėja, kvėpavimo aparato organas
transcription	transkripcija, tikslus garsų tarimo užrašymas
triphthong	tribalsis
unrounded vowel	nelūpinis balsis
uvula	liežuvėlis
velar	veliarinis, minkštojo gomurio
velum	minkštasis gomurys
vocal folds	balso stygos

vocal ligament	balsinis raištis, balso stygos
vocalisation	vokalizacija, balsinimas
voiced	skardus
voiceless	duslus
vowel	balsis

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List of videos and interactive sites
https://www.youtube.com/watch?v=TNFKG0yvDx4&list=PLD6B222E02447DC07
https://agendaweb.org/phonetic.html
https://www.youtube.com/watch?v=htmkbIboG9Q

Good Luck

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