Lecture 5: Types of Sound Change

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5.1 A Re-Cap of Basic Phonological Concepts

Before we begin a detailed discussion of various types of sound change, let us make sure we remember some of the basic terms / phonological concepts:

5.1.1 Phonemes, Allophones & Minimal Pairs/Sets

We all know that part of our knowledge of a language is knowledge of the phonology, or sound system of that language. We must be able to use the **phones**, or sound segments, that occur in that language, and we should also know the ways in which they ***pattern***. It is this patterning that determines the number of *phonemes* (sound segments that differentiate words) in a language.

Phoneme is:

- **the smallest unit of sound which may distinguish two words**
- **the *contrastive* sound segment which both the speaker and the hearer perceive to be the same.**

N.B.: Phonemes are not sounds as such, they are mental sound images – units, *representing* sounds. These mental images are like 'footprints' of sounds, forming moulds that several similar sounds can fit into - that is why we may perceive several actual *phones* (sounds) to be the same ***phoneme***.

Minimal Pairs are **two words**

- **with *different meanings***
- **with *identical phonetic features,* except for a difference in *one phoneme* in exactly *the same position* in the word (*initial, medial,* or *final*)**.

For example, *p*it & *f*it; f*i*t & f*a*t; pi*ck* & pi*g*, etc. (note that the pairs of words are different only in one sound in the same position (initial, medial, or final).

Minimal sets: several minimal pairs make a minimal set:

pit, fit, git, shit, bit, sit, lit, wit, or
fit, fate, fat, foot, fought, feet, fart, or
pit, pick, pig, pin, piss, pish, etc.

So ***minimal pairs*** (or ***minimal sets***) are pairs/sets of words, which are identical except for one phoneme in exactly the same position in each word, i.e.: pain / bane / lane / sane / main / rain / wane / cane / gain, etc.
Analysis of *minimal pairs* helps us identify the phonemes of any language.

Allophones
All people speak in their own peculiar ways: an Australian will speak English differently from an American, a British or an Indian. 'You are what you say' in the sense that we are all products of our different environments which shape our linguistic behaviour. Our speech reflects our individuality and background. Apart from basic physical differences, factors such as social class, age, sex, and occupation also leave a mark on the way we speak. Some people have high voices, some low, some voices are squeaky, some - melodious. Even the same person's voice and pronunciation vary depending on whether they have a sore throat, a blocked nose, or something else wrong (or right!) with them ☺.
Just imagine what would have happened, if we were unable to *perceive* all these different variations of the basic sounds as the same phonemes! Communication would have become impossible, because there are no two people on this planet that speak in exactly the same way – not even ONE person who ALWAYS pronounces words in the same way! The second definition of the term *phoneme* makes a very important point: a ***phoneme*** is the *contrastive* sound segment, which both the speaker and the hearer *perceive to be the same*.

Speech communication works, because *despite* all the differences in our individual ways of pronouncing the basic sounds, we *perceive* them to be the same sound. It is only when the difference in pronunciation reaches a 'critical mass' that these differences become a barrier to communication.

Allophones are the actual sounds we hear – they are variations of phonemes resulting from the influence of neighbouring phonemes in connected speech, or from the individual speaker's way of talking. Allophones are still perceived to be the same contrastive sound by both speaker and receiver; they do not cause communication problems, unless they deviate too much from the standard phoneme and begin to sound like another: co***p***y – co***ff***ee, etc.
In other words, allophones do not (as a rule) affect meaning, although very divergent forms may cause occasional misunderstanding, like in the case of that poor woman in the hospital, who burst into tears upon hearing her Australian doctor say, [j@}} r} g@UiN} h@Um %t@dai]! ☺

5.1.2 Phonological Adaptation in Connected Speech

At any given moment in running speech, a targeted phone will differ slightly from the same phone uttered in a different context due to the influence of ***coarticulation, adaptation,*** **and** ***assimilation***.

- ***Coarticulation****:* the simultaneous movement of the muscles and articulators to produce two different phones in connected speech. This movement modifies the production of adjacent phones.
- ***Adaptation****:* variation in the way in which articulators move and the extent to which vocal tract configuration changes shape according to preceding and following sounds.

- ***Assimilation****:* modification in the audible characteristics of a phone (speech sound) due to the characteristics of another phone in the utterance. An earlier phone in a word may affect a later phone (progressive assimilation), or a later phone may affect an earlier one (regressive assimilation).

N.B. It will be good for you at this point to revise *sound changes in connected speech* in some more detail – pay particular attention to *neutralization*, the different types of *assimilation* (place, manner, and force of articulation), *elision* and *link*ing [pls. refer to notes at the end of this lecture].

5.1.3 Vowels versus Consonants

Vowels are those sounds that pass through the mouth without encountering any obstruction.

Consonant sounds, on the other hand, have all been impeded, obstructed, or constricted in some form or another.

Therefore, consonants and vowels have their own characteristics:

- When talking about **consonants,** we can define
  - where the obstruction takes place (*Place of Articulation*) and
  - what form the obstruction takes (*Manner of Articulation*).

  We can also describe consonants based on whether or not the vocal cords vibrate during the enunciation process (voiced / voiceless consonants).

- Analysing the **vowels** is a little more difficult: each vowel is distinctive, but because no physical obstruction takes place, it is quite difficult to determine exactly where each vowel is formed. The tongue clearly influences the flow of air, as does the shape of the mouth and even that of the lips (see notes at the end of lecture).

In the past weeks we have looked at the general concepts, scope, and methodology of Comparative Linguistics. We have also admired the fundamental design feature of human language: the serial interface of discrete combinatorial systems of sounds and strings of sounds, a hierarchy of different levels of organization:

- Phonological,
- Morphological,
- Lexical,
- Syntactic, and
- Semantic.

Our task in this course is to learn about how changes occur on all these different levels of linguistic organization over a period of time.

This week we shall focus on the 'natural tendencies' in phonological change. We shall look at some likely sound changes, and distinguish them from the unlikely ones.

We shall also try to group sound changes in the languages of the world into different *types* of change.

5.2. 'Natural Tendencies' in Phonological Change: Types of Sound Change

Talking about linguistic change, we noted the many 'natural tendencies' in language development. Remember McWhorter talking in his NewsHour interview about 'each word, each grammatical structure, each sound' being able to go every which way? Well, while it may not be particularly surprising that all languages change over time in all sorts of directions, it may be quite surprising to discover that different languages tend to change in remarkably *similar* ways. We also touched upon the subject of **the most natural development principle**, remember? We noted that

the most natural development principle is based on the fact that certain types of sound change are very common, whereas others are unlikely. A few examples of some well-documented types of sound change that we considered in the Indo-European languages were:

- **Final vowels often disappear**
- **Voiceless sounds become voiced between vowels**
- **Stops become fricatives** (under certain conditions)
- **Consonants become voiceless at the end of words.**

Today we shall look in more detail at the *types* of various kinds of sound changes in the languages of the world.

5.2.1 Lenition & Fortition

The first kind of sound change that we shall look at is ***lenition***, or weakening. This concept is based on the general perception that some sounds are relatively 'stronger' and others – 'weaker.' Most of us would intuitively judge the sounds in the left column 'stronger' than those in the right column:

'stronger'	'weaker'
b	p
p	f
f	h
x	h
b	w
v	w
ɑ	ə
i	i
d	l
s	r
k	?

We can make several generalizations regarding these correspondences:

- 'voiced' sounds are perceived to be 'stronger' than 'voiceless' sounds
- stops are 'stronger' than continuants
- consonants are 'stronger' than semi-vowels
- oral sounds are 'stronger' than glottal sounds
- front and back vowels are 'stronger' than central vowels

The generally accepted hierarchy of sonority (or loudness) is, starting with the 'strongest' and ending up with the 'weakest':

a > e > o > i > u > rhotics > laterals > nasals > voiced fricatives >voiceless fricatives>voiced stops > voiceless stops

Some changes tend to involve a shift from more sonorous to less sonorous sounds, and from 'stronger' to 'weaker' sounds. That is to say, that we would be more likely to find a change of [k] to [ʔ], than the other way around. Changes in the reverse order are also possible, of course, even though they are less likely. We may call rare sorts of sound changes 'strengthening' or 'fortition' (in contrast to 'lenition'):

English [naif] - Tok Pisin [naip]

Examples of lenition, taken from the Kara language of New Ireland, Papua New Guinea:

*bulan > fulan	'moon'
*tapine > tefin	'woman'
*punti > fut	'banana'
*topu > tuf	'sugarcane'

A specific type of lenition is called ***rhotacism***. ***Rhotic*** means pertaining to all kinds of ***r*** sounds (trills, flaps, glides, etc.), as distinct from all types of ***l*** sounds (***laterals***). Laterals and rhotics together make up the phonetic class of ***liquids***. The change we discussed last week – remember? - from **[s]** or **[z]** to **[r]** between vowels is called *rhotacism*. We discussed this kind of change last week, when we discussed Internal Reconstruction – remember the examples from Latin and some Germanic languages?

*flosis	>	floris	'of the flower'
*hono:sis	>	hono:ris	'of the honour'
*ami:kosum	>	ami:korum	'of the friends'
*genesis	>	generis	'of the type'

IE *wes- 'be' >	Dutch *wezen*	'to be'
	OE wæs / wæ:ron	
	ME was / were	

N.B. The Germanic case suggests that the change historically was *s* > *z* > *r*.

An extreme kind of lenition, a complete loss of one or more sounds, is also quite common in languages:

[histri], [istri], [p>raps]
Mi kam long bus > Mi kam lo bus

It is particularly common for final sounds to be dropped. Look at some examples from Fijian:

*ŋiur →	niu	'coconut'
*taŋis →	taŋi	'cry'
*ikan →	ika	'fish'
*bulan →	vula	'moon'
*tansik →	taði	'sea'
*laŋit →	laŋi	'sky'

Here are some specific kinds of sound loss:

- **Aphaeresis** [ə`fɛrəsəs] - initial segments are dropped: history > ‘istory, his > ‘is, etc.

- **Apocope** [əpɔkəpi] - the loss of word-final segments: *utu → ut ‘lice’; *aŋo → aŋ ‘fly’; *asue → asu ‘rat’; *use → us ‘rain’ (Southeast Ambrym in Vanuatu)

- **Syncope** [siŋkəpi] – loss of segments in the middle of the word: [pəli:smən] → [pli:smən], [pəhæps] → [præps], [medisin] → [medsin], etc.

- **Cluster Reduction** – consonant clusters are often reduced by deleting one (or more) of the consonants. English examples: *bomb, thumb, lamb, long, government, isn’t it?* In running speech,
  Russian examples: zdravstvuj, soobshchestvo, on uchitsja, ulibajetsja, etc., etc., etc.

- **Haplology** – contraction of a word by omission of one or more similar sounds or syllables: *mineralogy* for hypothetical *mineralology*, or [prɔbli] for [prɔbəbli], [læbɔrətri] for [læbɔrətəri], [laibrəri] → [laibri], etc.

5.2.2 Sound Addition

Sound addition, unlike lenition or total sound reduction, is rather rare in English: [sʌmpθiŋk] instead of [sʌmθiŋ], [nəʊp] instead of [nəʊ], [jep] instead of [jɛ:] – these are a few examples, mostly used in informal or jocular way.
Some languages, however, have a characteristic consonant-vowel syllable patterning (i.e., Japanese, Maori, etc.). If these languages borrow words whose syllables end in vowels, they tend to attach vowels to the final consonants, by analogy with native patterns (Maori ka:fe = ‘calf’; ko:ti = ‘court’; kuki = ‘cook,’ etc.). Italian accent in English is also sometimes distinguished by the addition of vowel sounds to final consonants.
There are several kinds of sound addition:

- **Excrescence –** a consonant is added between two other consonants. This change is against the general tendency in languages to produce consonant + vowel structures, and so it is rather rare. The insertion of [p] in the middle of [mθ] cluster in ‘*something*’ is one example; others: *æmtig → ɛmpti ‘empty’; *θymle → θimbl ‘thimble,’ etc.

- **Epenthesis** – or **Anaptyxis –** is insertion of a vowel to break up a consonant cluster. Some varieties of English insert an epenthetic schwa [@] between the final consonants of a word, i.e., [filəm] for [film], [milək] for [milk], etc. It is also common in Tok Pisin: English [blæk] → Tok Pisin [bilæk], [blu:] → [bulu], [nekst] → [nekis], [siks] → [sikis], [skin] → [sikin], [plɛis] → [peles], [film] → [pilum], [plenty] → [pəlenti], etc.

- **Prothesis** – a specific type of sound addition, the addition of a sound at the beginning of a word: Motu *api became *lahi* ‘fire,’ *asan became *lada* ‘gills of fish,’ *au became *lau* ‘I, me’

5.3 Metathesis

Metathesis is a change in the *order* of the sounds, i.e., if you say [æks] instead of 'ask,' or '*revelant*' instead of '*relevant.*' Some English words changed by metathesis, i.e., *bird* was originally [brid], which became [bird] (the form we captured in the spelling). Then the sounds [ir] underwent further changes in some dialects to become [ə:], although in some dialects of English, such as American, Scottish, or Irish, the original /r/ is still pronounced.

Although *metathesis* usually affects only a few words in a language, it seems to have occurred rather systematically between Ilokano and Tagalog, the national language of the Philippines (the 'source'):

Tagalog	Ilokano	English
taŋis [ijak]	sa:ŋit	'cry'
tubus	subut	'redeem'
tigis	si:git	'decant'
tamis	samqit	'sweet'

5.4 Fusion

Phonetic *fusion* of separate sounds into one is a common sound change. The resultant sound usually has the phonetic features of both of the original sounds. Please go through the short description of English consonants and vowels, as well as their classification at the end of this lecture – it should help you remember which *phonetic features* to look for in both

- **Consonants**:
  - *Place* of Articulation
  - *Manner* of Articulation
  - *Force* of Articulation

and

- **Vowels**:
  - *Oral or Nasal* (this is determined by the position of the soft palate – raised for oral vowels, lowered for nasalised vowels)
  - *Rounded or Unrounded* (this is determined by the kind of aperture formed by the lips – degrees of spreading or rounding), and
  - *Front/Central/Back/ and High/Mid/Low*, which is determined by which part of the tongue is raised, and by the degree of raising

When two sounds fuse into one, the 'blend' of the two becomes different from both, and yet possesses some of the qualities of both. Take, for example, French:

***œn** → **œ~** 'one'
***bɔn** → **bɔ~** 'good'
***vɛn** → **vɛ~** 'wine'
***blan** → **bla~** 'white'

The symbol **~** , called *tilde*, is supposed to be placed over the vowel (you'll have to excuse my imprecision here) to indicate that the vowel is nasalised, with the air coming out through the nasal passage as well as through the mouth. The generalisation we can make here is that:

Vowel + Nasal = Nasalised Vowel

Other examples of fusion:

		Attic Greek	
*gwous	>	bous	'cow'
*gwasileus	>	basileus	'official'
*gwatis	>	basis	'going'
*leikwɔ:	>	leipɔ:	'I leave'
*jɛ:kwar	>	hɛ:par	'liver'

*In the original forms, there was a /g/ or a /k/ (velar stops). These were followed by a /w/, which is a semi-vowel with lip-rounding. In the fused form of the Attic dialect, the 'stop' feature of the first sound was taken along with the bilabial features of the second sound to produce a bilabial stop (/b/ or /p/).

Question: **Revise *assimilation* in connected speech and draw parallels between the two.**

A particular *kind* of phonological fusion – ***lengthening***; look at some examples from Old Irish:

*magl	>	ma:l	'prince'
*kenetl	>	kene:l	'gender'
*etn	>	e:n	'bird'
*datl	>	da:l	'assembly'

Here, in a sort of 'compensation' for the lost consonant, the preceding vowel is lengthened.

5.5 Unpacking

This is just the opposite of phonetic fusion:

French			Bislama (Melanesian Pidgin spoken in Vanuatu)	
Camion	kamiɔ~	→	kamioŋ	'truck'
Accident	aksida~	→	aksidoŋ	'accident'
Carton	kaʁtɔ~	→	kartoŋ	'carton, cardboard box'
CaleCon	kalsɔ~	→	kalsoŋ	'underpants'

Result: Nasal Vowel > Vowel + Nasal Consonant

5.6 Vowel Breaking

Here a single vowel changes to become a diphthong, with the original vowel remaining the same, but with a glide of some kind added either before, or after it (*on-glide* or *off-glide*). Some varieties of American English show signs of vowel breaking: [b&d] → [b&@d, b&id] (with an off-glide @ or even I).
One of the distinguishing features of Barbadian English in the West Indies is the palatal on-glide /j/ before the vowel [&], so people in Barbados say [kj&t] rather than [k&t].
Vowel breaking has also taken place in the Kairiru language spoken on an island near Wewak (these examples also exhibit *apocope*, or the loss of final vowels):

*pale	>	pial	'house'
*manu	>	mian	'bird'
*namu	>	niam	'mosquito'
*lako	>	liak	'go'

5.7 Assimilation [əsimi'leiʃən]

Many factors affect sounds in running speech, most of them resulting from the physical limitations of our organs of speech: our tongues, lips and soft palates are not fast, or flexible enough, to cope with the flow of speech! They cannot move quickly enough to get from one position to another in order to articulate the next sound *precisely*. Many sound changes are due to the influence of one sound upon another, causing the other sound to become more like the 'influencing' sound itself. If a sound change results in more *shared phonetic features between two sounds*, this results in ***assimilation.*** There are 3 main types of assimilation:

- **Assimilation of Place**: **/t/ → /p**/ in *rat**b**ag* ['ræpbAg], *good boy* ['gʊbɔi], or *oa**tm**eal* ['əʊpmi:l], etc. This is because the alveolar plosive /t/ is simplified into the /p/ sound, which is closer to the bilabial plosive /b/ and to the bilabial nasal /m/.

- **Assimilation of Manner**: occurs when two different manners of articulation influence each other to form a different manner of articulation: *Indian* ['indʒiən] and *soldier* [sɔldʒiə]. This is because the plosive /d/ combines with the approximant /j / to form an affricate.

- **Assimilation of Voice**: have to ['hæftə] (voiced fricative followed by a voiceless consonant)

Assimilation of place will, of course, affect the manner of articulation, so these different types of assimilation usually occur together. ***Assimilation*** can be

- ***partial,*** when the changed sound retains at least one of its original features, or
- ***total***, when the two sounds end up identical (a *geminate*, or phonetically double sound);
- ***regressive*** (operating backwards, i.e. when the preceding sound is changed: A < B), and
- ***progressive*** (operating forwards, when the following sound becomes more like the preceding one: A > B)

Assimilation is:

- ***partial,*** when the changed sound retains at least one of its original features (p*artial regressive assimilation* examples: **in**divisible [%indi'viz@bl], **im**balance [%im'b&l@ns], **in**credible [iN'kred@bl], **in**admissible [%in@d'mis@bl], etc.

or

- ***total***, when the two sounds end up identical (a *geminate*, or phonetically double sound; you can see many examples of ***total regressive assimilation*** in Modern English word formation, where the last prefix consonant becomes totally like the following sound:

abbreviate	**ag**gressive	**ap**peal	**at**tend
account	**al**leviate	**ar**rive	
affect	**an**nual	**as**sent	

But: **ad**mire, **ad**just, **ad**jacent, **ad**vance, etc. All the highlighted prefixes are adaptations of prefix '**ad-**' meaning 'to, toward.' The ***d*** in **ad-** always changes to the sound of any following consonant, except **m**, **j**, and **v**.

and

- ***regressive*** (operating backwards, i.e. when the ***preceding*** sound is changed: A < B), or
- ***progressive*** (operating forwards, when the ***following*** sound becomes more like the preceding one: A > B)

Voicing of intervocalic stops and ***devoicing*** of voiced consonants in word final positions are also a common type of assimilation in many languages:
Russian: [got] 'year' → [goda] 'of the year'; [gorot] 'city' → [goroda] 'of the city'

German: *Bad* [ba:t] ‘bath’; *Tag* [ta:k] ‘day’; *Hund* [hunt] ‘dog’, etc.

Under normal circumstances, apart from our rather clumsy articulators, our breathing also affects the sounds we make – try to say something after a race, a break dance, or even a waltz! ☺ In order to combine the two functions (breathing and speaking), every language has developed a rhythm of its own, largely determined by its stress patterns. A number of phonological adaptations occur in connected speech, particularly in the ***unstressed*** segments, where ***neutralisation*** is common.

The reason for assimilation is because the tongue cannot always move quickly enough to get from one position to another in order to articulate the next sound, or because the mouth is too busy anticipating the following sound. In either case, it approximates the sound before moving on to the next segment of sound.

You can see many examples of *total regressive assimilation* in Modern English word formation:

abbreviate	**ag**gressive	**ap**peal	**at**tend
account	**al**leviate	**ar**rive	
affect	**an**nual	**as**sent	

But: **ad**mire, **ad**just, **ad**jacent, **ad**vance, etc.

All the highlighted prefixes are allomorphs of **ad-** ‘to, toward.’ The **d** in **ad-** always changes to the sound of any following consonant, except **m**, **j**, and **v**.

Partial regressive assimilation may be seen in some of these examples:

indivisible	[indəvizəbl]
imbalance	[imbæləns]
incredible	[iŋkredəbl]
inadmissible	[inædmisəbl]

Palatalisation is a kind of Assimilation of Manner of Articulation, which occurs when two different manners of articulation influence each other to form a different manner of articulation: Indian [‘indʒiən], soldier [sɔldʒiə]. By this change, a non-palatal sound becomes a palatal sound, usually before a front high vowel /i/, or sometimes /e/, or before the semi-vowel /j/ (like in the examples above, the plosive /d/ combines with the approximant /j/ to form an affricate*).

*Sounds that we can class as palatal are palato-alveolar affricates [tʃ], [dʒ] and the sibilants [ʃ,ʒ].

This change can be described as assimilatory, because the palatal feature of the vowel (high, front) is transferred to the preceding consonant:

Standard Fijian: [tinana] → Dialects: [tʃinana] ‘his/her mother’

We have also read about palatalisation having taken place in the history of English, when velar stops /k/ and /g/ became palatalised [tʃ] and [j] respectively before a front vowel:

*kinn	→	tʃin	‘chin’
*kE:si	→	tʃi:z	‘cheese’
*geldan	→	ji:ld	‘yield’
*gearn	→	ja:n	‘yarn, thread’

N.B. The change of /g/ to /j/ probably involved palatalisation of /g/ to [dʒ] first, which then underwent lenition to /j/.

Voicing of intervocalic stops and **Devoicing** of voiced consonants in word final positions are also a common type of assimilation in many languages:

Russian: [got] 'year' → [goda] 'of the year'; [gorot] 'city' → [goroda] 'of the city'
German: *Bad* [ba:t] 'bath'; *Tag* [ta:k] 'day'; *Hund* [hunt] 'dog', etc.

Vowel Harmony: Sometimes assimilation may cause a change in a sound not immediately before or after the 'influencing' sound, but further away in the word - at a distance, and some type of assimilation may even apply over an entire word. This is called ***harmony***. Many languages have ***vowel harmony***, which means that there is assimilation of one or more features of one vowel to some or all of the other vowels in the same word. In Bislama, for example, we see:

kuk-um - 'cook'	mit-im – 'meet'	har-em – 'feel
put-um – 'put'	kil-im – 'hit'	mek-em – 'make'
sut-um - 'shoot'	rit-im - 'read'	so-em - 'show'

Following a syllable with a *high back* vowel, the *high front* /i/ vowel of the suffix becomes high *back* vowel /u/.
Following a syllable with a mid or low vowel, the high front /i/ of the suffix is lowered to /e/.

Umlaut – this term is most frequently used in Germanic languages to refer to the fronting of a back vowel or the raising of a low vowel under the influence of a high front vowel in the following syllable. Often the high front vowel that had caused the change, was later dropped (by *apocope*), or reduced to schwa. Thus the new front vowel became the only way of marking the difference between some words. The irregular singular/plural pairs, such as *foot/feet* in English are the result of such vowel harmony, or *umlaut*: Sg. [fo:t], Pl. [fɔti] → [fæti] → [fe:t] → [fi:t]

For other examples and a more schematic discussion of assimilation, pls. see notes at the end of lecture. Read Chapter Two of *An Introduction to Historical* Linguistics by Terry Crowley for more details.

5.8 Dissimilation

This process is precisely opposite of assimilation: instead of making two sounds more similar, it makes one sound become less like some other nearby sound.

A famous example of dissimilation, frequently mentioned in textbooks of historical linguistics, is often referred to as *Grassman's Law* (after the German linguist Hermann Grassman, who first wrote about it in 1862). This sound change took place in both Sanskrit and Ancient Greek, both of which distinguished phonemically between aspirated and unaspirated stops. In words with two consecutive syllables containing aspirated stops, the first of these lost its aspiration:

Sanskrit:	*bho:dha	→	bo:dha	'bid'
Greek;	*phewtho	→	pewtho	'bid'

An example of immediate dissimilation (as opposed to dissimilation at a distance in the examples above) can be found in Afrikaans:

		Afrikaans	
*sxo:n	→	sko:n	'clean'
*sxoudər	→	skoudər	'shoulder'
*sxult	→	skult	'debt'

In the original form, there was a sequence of two fricative sounds, [s], [x]. In Afrikaans, the fricative [x] changed to a stop at the same place of articulation, [k], so that there would be no longer the two fricatives next to each other: [x] dissimilated in manner of articulation to [k] from the fricative [s].

This list of possible sound changes is, of course, incomplete, but it will give you an idea of a few of the 'every which ways' (in the words of McWhorter) that languages may go.

Summary:

- **Lenition** (weakening) and **Fortition** (strengthening) are the two major categories of sound change. These categories are based on the *perceived sonority* (loudness) of sounds, expressed in the following hierarchy (strongest to weakest sounds):

a > e > o > i > u > rhotics > laterals > nasals > voiced fricatives >voiceless fricatives>voiced stops > voiceless stops

- The variety of possible sound changes include:
    - **Aphaeresis** (> Greek *aphaeresis*, 'taking off' > *aphairein*, 'to take away'): the loss of one or more sounds or letters at the *beginning* of a word, as in *'round* for *around*, *'cause, 'coz* for *because*, '*coon* for *raccoon*, etc.
    - **Apocope** (> Late Latin > Greek 'cutting off' > *apo-+ koptein*, 'to cut off'): the loss of sounds or letters at the *end* of a word, as *sing* from Old English *singan*, etc.
    - **Syncope** (< Late Latin < Greek *syncope*, 'cutting short', < *syn-+koptein*, 'to cut short'): the loss of one or more sounds or letters in the interior of a word, as in *fo'c'sle* for *forecastle*, etc.
    - **Cluster Reduction**, or deletion of one or more of the consonants in a consonant cluster, as in *thumb, bomb, lamb, handkerchief, government*, etc.
    - **Haplology**, contraction of a word by omission of one or more *similar* sounds or syllables, as in *mineralogy* for hypothetical *mineralology*, or *p'raps* for *perhaps*, [prɔbli] for 'probably,' etc.

- **Sound Addition** (more rare than *lenition*), focusing particularly on
    - **Excrescence**, which means literally 'a) a projection or outgrowth, esp. when abnormal, i.e. '*warty excrescences in the colon*' or b) a disgusting, extraneous, unwanted mark or part [Merriam-Webster Collegiate Dictionary]. In this context it simply means the insertion of a consonant sound between two other consonants in a word: [sʌmpθiŋ], æmtig → ɛmpti, θymle → θimbl, etc.
    - **Epenthesis** (< Late Latin < Greek *epentithenai*, 'to insert' < *epi-+entithenai*, 'to put in' < *en+tithenai*, 'to put'): insertion of a vowel to break up two consonants in a cluster, as in [æθəli:t] for 'athlete,' [milək] for 'milk,' or [filəm] for 'film.'
    - **Prothesis** < Greek 'addition'): the addition of a sound to the beginning of a word (as in Old French *estat* > English *estate* < Latin *status*).

- **Metathesis**, the interchange in the order of sounds: relevant : revelant, ask : [aks], etc.

- **Fusion** of separate sounds into one: the resultant sound usually has the phonetic features of both of the original sounds.

- **Unpacking:** the breaking up of a fused sound into the original components.

- **Vowel Breaking:** a single vowel changes into a diphthong, as in [bæid], [bæəd] for *bad*, and [kjæt] for *cat.*

- **Assimilation**, is when one sound is influenced and changed by another, neighbouring sound. Assimilation can be
  - ***partial,*** when the changed sound retains at least one of its original features, or
  - ***total***, when the two sounds end up identical (a *geminate*, or phonetically double sound);
  - ***regressive*** (operating backwards, i.e. when the preceding sound is changed: A < B), and
  - ***progressive*** (operating forwards, when the following sound becomes more like the preceding one: A > B)

<u>The 3 *types* of assimilation are</u>:

- **Assimilation of Place of Articulation**: ratbag or oatmeal (/t/ - /p/); this is because the alveolar plosive /t/ is simplified into the /p/ sound, which is closer to the bilabial plosive /b/.
  - **Assimilation of Manner of Articulation**: occurs when two different manners of articulation influence each other to form a different manner of articulation: Indian [ˈindʒiən] and soldier [sɔldʒiə]. This is because the plosive /d/ combines with the approximant /j/ to form an affricate. **Palatalisation** is a kind of *Assimilation of Manner of Articulation*, which occurs when two different manners of articulation influence each other to form a different manner of articulation: Indian [ˈindʒiən], soldier [sɔldʒiə].
  - **Assimilation of Voice**: have to [ˈhæftə] (voiced fricative followed by a voiceless consonant). **Voicing** of intervocalic stops and **Devoicing** of voiced consonants in word final positions, i.e. Russian: [got] 'year' → [goda] 'of the year'; [gorot] 'city' → [goroda] 'of the city'; German: *Bad* [ba:t] 'bath'; *Tag* [ta:k] 'day'; *Hund* [hunt] 'dog', etc.
  - **Vowel Harmony:** a change in a sound not immediately before or after the 'influencing' sound, but further away in the word; assimilation of one or more features of one vowel to some or all of the other vowels in the same word.
  - **Umlaut** – the fronting of a back vowel or the raising of a low vowel under the influence of a high front vowel in the following syllable.
- **Dissimilation**: the opposite of assimilation; instead of making two sounds more similar, it makes one sound become <u>less</u> like some other nearby sound.

<u>Questions</u>

Q 1 What is *lenition*?
Q 2 What is *rhotacism*?
Q 3 What is *cluster reduction*?
Q 4 What is the difference between *apocope* and *syncope*?
Q 5 What is the difference between *haplology* and *metathesis*?
Q 6 What is the difference between *aphaeresis* and *prothesis*?
Q 7 What is the difference between *excrescence* and *epenthesis*?
Q 8 What is phonetic *fusion*?
Q 9 What is *compensatory lengthening*?
Q 10 What is the difference between phonetic *unpacking* and *vowel breaking*?
Q 11 How is *assimilation* different from *dissimilation*?
Q 12 What is the difference between *partial* and *complete assimilation*?
Q 13 What is *palatalisation*, and how can this be viewed as assimilation?
Q 14 What is *vowel* or *consonant harmony*?

Exercises

1. Some of the phonetic changes that we have talked about today seem to belong to more than just one of the categories mentioned, i.e., *final devoicing*: we described it as a kind of assimilation, and also as *lenition*, or weakening. Can you find any other kind of sound change that can be described under more than one heading?

2. What do you think the spelling of the following words indicates about the phonetic history of English: *lamb, sing, night, rough, stone, mate, tune, Christmas.* Describe any changes that might have taken place in terms of the sound changes that we have discussed.

3. Many place names in England have spellings that do not reflect their actual pronunciations. From the following list, suggest the kinds of phonetic changes that may have occurred:

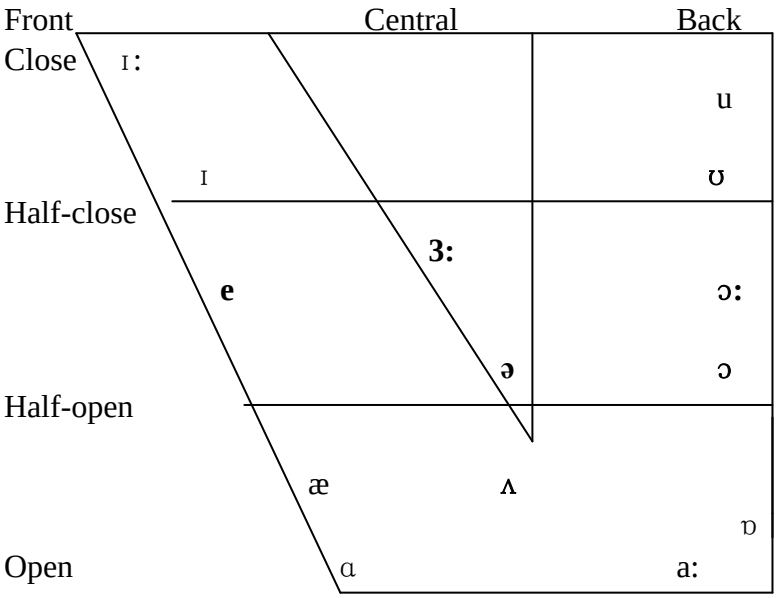
Cirencester	[sistə]
Salisbury	[sɔlzbʁi]
Barnoldswick	[ba:lik]
Leicester	[lɛstə]
Chiswick	[tʃizik]
Cholomondely	[tʃʌmli]
Gloucester	[glɔstə]

Appendix:

Natural Classes of Sounds: Classification of English Phonemes

Classification of English Vowels:

Because no physical obstruction occurs in our vocal tracts when we pronounce vowels, it is quite difficult to determine exactly *where* each vowel is formed. The tongue clearly influences the flow of air, as does the shape of the mouth and even that of the lips. One of the ways we can plot the position of a vowel is through the **cardinal vowel diagram**:



The cardinal vowel diagram represents the shape of the oral resonating chamber which changes with tongue movement while articulating vowel sounds. This diagram indicates:

- **The tongue position in the mouth (front/back)** and
- **Which part of the tongue is raised the highest.**

Try saying /ɪː/, then /u:/ (as in *pee / pooh*). You should notice the change in the position of your tongue from front to back.
On the vertical axis, those sounds towards the top of the diagram represent those articulated with a relatively closed mouth, whilst those towards the bottom are far more open.
Try saying these sounds in the order they come: /ɪː/, /e/, /æ/, and /u:/, /ɔ:/, /ɒ/, /a:/. You should feel the gradual opening of the mouth.

Vowel Quality (3-term classification)
According to the Cardinal Vowel Diagram, which tracks tongue position, English vowels may be classified as:

- open/close (low/high)
- front/back, and
- round/unround (depending on the configuration of the lips).

For example:

- [u:] – close back round
- [i:] – close front unround

- [a:] – open back unround

We have already mentioned that English vowels may also be characterized by the *degree of* ***tension*** in the tongue (tense/lax, or long/short) vowels and by whether the vowel is a single sound or a diphthong (glide). Therefore, English vowels also fall into two types:

- short/long (lax/tense), and
- monophthong/diphthong (triphthong).

If we want to give a full description of any vowel sound, we would have to characterise it using **the full 5-term classification**, indicating whether the sound is:

- close/half close/half open/open
- front/central/back
- round/unround
- short (lax)/long (tense)
- monophthong/diphthong (triphthong),

for example: /i:/ - close, front, unround, long (tense), monophthong
/i / - close, front, unround, short (lax), monophthong
/e/ - mid (half open), front, unround, short (lax), monophthong
/æ/- open, front, unround, short (lax), monophthong
/ə/- open, central, unround, short (lax), monophthong
/3:/- mid (half open), central, unround, long (tense), monophthong
/ʌ/- mid (half open), central, unround, short (lax), monophthong
/ɒ/- open, back, round, short (lax), monophthong
/ɔ:/- open, back, round, long (tense), monophthong
/ʊ/- close, back, round, short (lax), monophthong
/u:/- close, back, round, long (tense), monophthong
/a:/- open, back, unround, long (tense), monophthong

Activity: This exercise is to try and help you differentiate between short and long vowels. Read to the words on the left and decide which is the correct symbol for the vowel:

1	bird	/ə/	/3:/	/ə:/
2	man	/æ/	/a:/	/ɑ/
3	put	/u:/	/ʊ/	/ʌ/
4	pit	/i/	/ɪ /	/ɪ:/
5	seen	/ɪ /	/i /	/ɪ:/
6	head	/ə/	/3:/	/e/
7	caught	/ɔ:/	/ɒ/	/ɛ:/
8	car	/ɒ/	/ɑ/	/a:/
9	boot	/ʊ/	/u:/	/ʊ:/

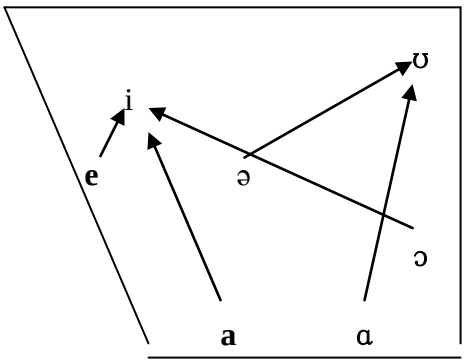
The Diphthongs [ðə ‘difθɔŋz]

In English, as in most languages, vowels can also glide into one another to form ***diphthongs*** and even (according to some classifications) ***triphthongs***. Diphthongs are those sounds that consist of a movement or glide from one vowel to another. The first part of a diphthong in English (unlike Latvian diphthong ‘ie’) is always longer and stronger than the second part; as the sound glides into the second part of the diphthong, the loudness of the sound decreases.

The diphthongs are classified according to the direction of the glide (toward closer or more central second element):

English *Closing* Diphthongs:

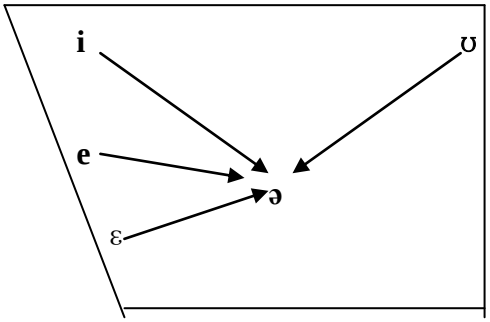
/i /-glides:	**/ei/**	as in 'face'	[f**ei**s]
	/**ai**/	as in 'nice'	[n**ai**s]
	/ɔi/	as in 'boy'	[bɔi]
/u/-glides:	**/ əʊ/**	as in 'rope'	[rəʊp]
	/**aʊ**/	as in 'house'	[h**aʊ**s]



English *Centering* Diphthongs:

Schwa-glides:

/ɪə /	as in 'fierce'	[fiəs]
/eə/	as in 'hair'	[heə]
/ɛə/	as in 'fair'	[fɛə]
/ʊə/	as in 'tour'	[tʊə]



Phoneticians disagree on whether to consider vowel sounds containing three elements as *diphthongs* or *triphthongs,* depending on their understanding of the term *syllable.* Each syllable can have only one vowel: If 'hire' and 'higher' are monosyllabic, /aiə/ is a triphthong. If they are bisyllabic, then the diphthong /ai/ is followed by schwa /ə/.

Vowels play an essential role in every language. They are far more difficult to transcribe than consonants and are also an extremely important area of English phonology, as they make up the greatest difference between English varieties.
As we know, vowels are determined by changes in the position of the lips, tongue and palate. Vowel sounds break up clusters of consonants by allowing air to pass through the mouth. Every word in the English language uses a vowel in some form or another – in fact, words have roughly as many syllables as they have vowel sounds.

We also have two ***semi-vowels***: /j/ and /**w**/. These sounds start with the tongue taking the position for the respective vowels, /ʊ/ and /u:/, but then further constriction of the air passage produces the qualitative change that places the resulting sounds half-way between vowels and consonants. We shall talk more about them, when considering English consonants:

English Consonants [iŋgliʃ kɔnsənənts]: Classification

English consonants are classified according to **three criteria**: **manner, place and force of articulation.**

1. Manner of Articulation: English consonants can be classified into two basic types according to *how* they are produced: ***obstruents*** and ***sonorants.*** In the pronunciation of ***obstruents*** the air-stream

is *obstructed*, which means that the air from the lungs meets an obstruction in the vocal tract that blocks it for a moment. ***Sonorants*** are made without any such obstruction of the air-stream, and that means that they are relatively louder than other sounds (they are said to have greater *sonority*).

Obstruents can be further divided into:

- ***stops/plosives*** are made by forming a complete obstruction – stop - to the flow of air through the mouth and nose and then suddenly releasing the pent-up air, making an explosion of air: /p/, /b/, /t/, /d/, /k/, /g/
- ***fricatives*** which are characterised by incomplete obstruction to the flow of air; this allows the air to escape through a narrow stricture, producing audible friction: /f/, /v/, /θ/, /ð/, /s/, /z/, /h/, /ʃ/, /ʒ/, and
- ***affricates*** – an affricate is a *plosive* immediately followed by a *fricative* in the same place of articulation:
  /tS/, /dZ/ . If you think about it, the /tS/ sound is made up from the plosive /t/ and the fricative /S/ pronounced almost simultaneously: ***ch****ur****ch****, ch****ip****, etc.* The same applies to /dʒ/: /d/ + /ʒ/ → /dʒ/, as in ***j****u****dge****, ****j****eep, etc.*

Sonorants (some people call them ***approximants***) can be divided into two main categories:

- ***nasal stops*** /m/, /n/, /ŋ/ - these are sonorant, because although the air is blocked in the mouth by lowering the soft palate, it continues to resonate and flow through the nose. If the nasal passage is blocked, as when you have a cold, or squeeze your nose tightly, these nasal stops will be realised as [b, d, g] – try it! ☺
- ***approximants (liquids /l/*** and ***/r/****, and* ***semi-vowels /j/*** and ***/w/)*** are sonorants - as well as all vowels – because when we pronounce them, the air resonates without being stopped.

2. Place of Articulation: After the air has left the larynx, it passes through the vocal tract. Consonants are produced by obstructing the air flow through the vocal tract. There are a number of places where the point of contact (or approximation) can take place. These places are called *articulators.* They include:

- Lips *(Labial)*: /p/ /b/ /m/
- Teeth *(Dental)*: /θ/, /ð/
- Lip+teeth *(Labio-Dental)*: /f/ /v/
- Alveolar Ridge *(Alveolar)*: /s/ /z/ /t/ /d/ /l/ /r/ /n/
- Hard Palate *(Palatal)*: /j/
- Hard Palate & Alveolar Ridge *(Palato-Alveolar)*: /ʃ/, /ʒ/, /tʃ/, /dʒ/
- Soft Palate *(Velar)*: /k/ /g/ /ŋ/
- Throat *(Glottal)*: /h/ /ʔ/

3. Force of Articulation: If we classify the two phonemes **/f, v/** according to their *place* and *manner* of articulation, we shall see that they are both labio-dental fricatives. How can we distinguish between these two phonemes? We commonly refer to this difference as being 'voiced' and 'voiceless,' where *voiced* means that the vocal cords are vibrating. However, this is not an accurate term because voicing varies according to their position in the word. In initial and final positions the voiced stops **/b, d, g/** are hardly voiced at all. In order to distinguish between the phonemes /p, f, t, θ, s, k/ and /b, v, d, ð, z, g/ phoneticians say that the first group is pronounced with more ***force*** than the second group, and this distinction is called ***fortis*** (meaning *strong*) and

lenis (meaning *weak*), accordingly. The ***fortis consonants*** are always ***voiceless***, while the ***lenis consonants*** are sometimes ***voiced.*** All the consonants mentioned above belong to pairs distinguished by the difference between fortis and lenis. The remaining English consonants are not paired in this way, so it is not necessary to include this distinction when classifying the other consonants:

	Lenis / Fortis	**Place of Articulation**	**Manner of Articulation**
/p/	fortis	labial	Plosive
/b/	lenis	labial	Plosive
/t/	fortis	alveolar	Plosive
/d/	lenis	alveolar	Plosive
/t/	fortis	palato-alveolar	Affricate
/d /	lenis	palato-alveolar	Affricate
/k/	fortis	velar	Plosive
/g/	lenis	velar	Plosive
/f/	fortis	labio-dental	Fricative
/v/	lenis	labio-dental	Fricative
/θ/	fortis	dental	Fricative
/ð/	lenis	dental	Fricative
/s/	fortis	alveolar	Fricative
/z/	lenis	alveolar	Fricative
/tʃ/	fortis	palato-alveolar	Fricative
/dʒ/	lenis	palato-alveolar	Fricative
/h/	fortis	glottal	Fricative
/m/		labial	Nasal
/n/		alveolar	Nasal
/ŋ/		velar	Nasal
/l/		alveolar	Approximant
/w/		bilabial/velar	Approximant
/r/		alveolar	Approximant
/j/		palatal	Approximant

These three criteria (force, place, and manner of articulation) enable us to describe most consonants in human languages.

Phonological Adaptation: *Sounds in Connected Speech*

Discussing speech sounds, we have seen that their quality is determined by the shape of the resonance chambers and the position of the tongue and other articulators. When we speak, we do not make pauses between words – we produce long strings of sounds, all blending into a stream of sounds. At any given moment in running speech, a targeted phone will differ slightly from another representing the same phoneme, but uttered in a different context. Why is this so?

Assimilation [əˌsimiˈleiʃən]

Many sound changes are really due to the influence of one sound upon another, causing the other sound to become more like the 'influencing' sound itself. If a sound change results in more shared phonetic features between two sounds, then assimilation has taken place.

Assimilation can be

- ***partial,*** when the changed sound retains at least one of its original features, or

- ***total***, when the two sounds end up identical (a *geminate*, or phonetically double sound);
- ***regressive*** (operating backwards, i.e. when the preceding sound is changed: A < B), and
- ***progressive*** (operating forwards, when the following sound becomes more like the preceding one: A > B)

Neutralisation [,nju:trəlai'zeiʃən] of Weak Forms

Weak forms are those words that are pronounced in an *unstressed* manner. Many of the most common words in English can come in either a strong form or a weak form. The *weak forms* are nearly all ***function words***, such as conjunctions, articles, pronouns, prepositions and some auxiliary and modal verbs.

Generally, the ***strong forms*** of these words are used when they are being directly quoted, when they are being contrasted, or if they appear at the end of a sentence.

The pronunciation of a weak form can be very different from the strong form of a word: if said in isolation, it could be all but unintelligible. It is usually the context that makes it understandable. In connected speech, many sounds in unstressed positions get neutralised, blurred between the two distinct sounds. This intermediate sound is known as neutralisation. This occurs in both vowels and consonants.

Neutralisation results in the centering of vowels to the neutral schwa [@], and sometimes in total omission of sounds and even whole syllables:

[stʊp] [ənd] [ʃʊp] → [stʊp ən ʃʊp]
[cʌp] [ɔv] [ti:] → [kʌpəti:], etc.

Elision & Linking

Elision [i'liʒən], or **Omission**:
Elision occurs when a sound or syllable is lost, or omitted. It particularly affects :

- Consonant clusters
- Weakly stressed syllables that are not especially missed
- Words that end in an alveolar consonant and that are immediately followed by a word beginning with a consonant.

The sounds that are elided are those that are so weakly articulated that they become insignificant.

Some elided syllables are represented in standard punctuation (for example, ***I'm*** should be ***I am***). In standard speech, the missing vowel is understood, and so meaning does not suffer from this contraction.

Elision is one of the reasons for the great mismatches found in English between a word's spelling and its pronunciation (Wednesday, for example, was originally a contraction of *Odin's day*, while today Odin is barely discernable, as the /d/ is no longer pronounced).

Elision is particularly common in connected speech, when the speech sounds we make are so open to the influence of the neighbouring sounds. It stands to reason, that the faster the speech, the more likely are the sounds / syllables to be elided. Examples:

- The loss of a weak vowel after the voiceless (fortis) plosives /p/, /t/, /k/:
  [p'teitəʊ] is an example of the schwa being elided after /p/.

- Another cause of ***elision*** is when a weak vowel is elided before a syllabic consonant (/l/ or /n/: [lesn] – lesson, lessen;
- Complex clusters are often elided:

  George the VIth throne: [dʒɔ:dʒ ðə siks θrəʊn]

- /v/ is often elided before a consonant: ['ləʊdz ə 'mʌni] 'loads of money'

- contracted forms are caused by elision: [aim] instead of [ai æm]

- some elision is just by convention or to speed up, or simply the way we speak:

  ['sekritri] rather than ['sekritəri].

N.B.:
- When a vowel sound is elided, it is usually a weak vowel, typically, the schwa.
- When a consonant is elided, it is usually because it is in an environment with other consonants.

Linking [liŋkinŋ]

Joining: If you have ever listened to people speaking a foreign language that was unknown to you, you may have noticed that it was impossible to pick out individual words from the string of sounds that you heard. This is because in real, connected speech, words *are* linked to one another. This is especially significant in RP, where the phoneme **/r/** does not occur in syllable-final position, unless the word with a final '**r**' is followed by a word beginning with a vowel.
Furthermore, when two vowels meet over a word boundary, an extra phoneme is frequently added in order to help the transition. While **/r/** is the most common linking sound, **/w/** and **/j/** may also be activated between two vowels:

- One example of linking is to **re-activate** an **/r/** sound:
  - *For better or worse:* [fɔ: beter ɔ: wə:s]

  - *Father or aunt*: [fa:ðər ɔr a:nt]

  - *There are oranges or apples in the cupboard:* [ðeəra:r ɔrindʒiz ɔr æplz in ðə kʌbəd]

  - *Father of three:* [fa:ðər əf θri:]

- Another example of linking is to **insert** an **/r/** between two vowels:

  - *That's the idea of it:* [ðæts ði aidiər əv it]
  - *The pilot saw an explosion* [ðə pailət sɔ:r ən eksləʊʒən]
  - *They are withdrawing their troops:* [ðej a: wiðdrɔ:riŋ ðeə tru:ps]

- *Pretty awful:* [pritirɔ:fʊl]

/j/ and **/w/** may also link words, for example:

- How often? [haw ɔfən] is easier than [ʻhaʊ ʻɔfən]
- They are: [ðej ʻaː] is said rather than [ʻðei ʻaː]