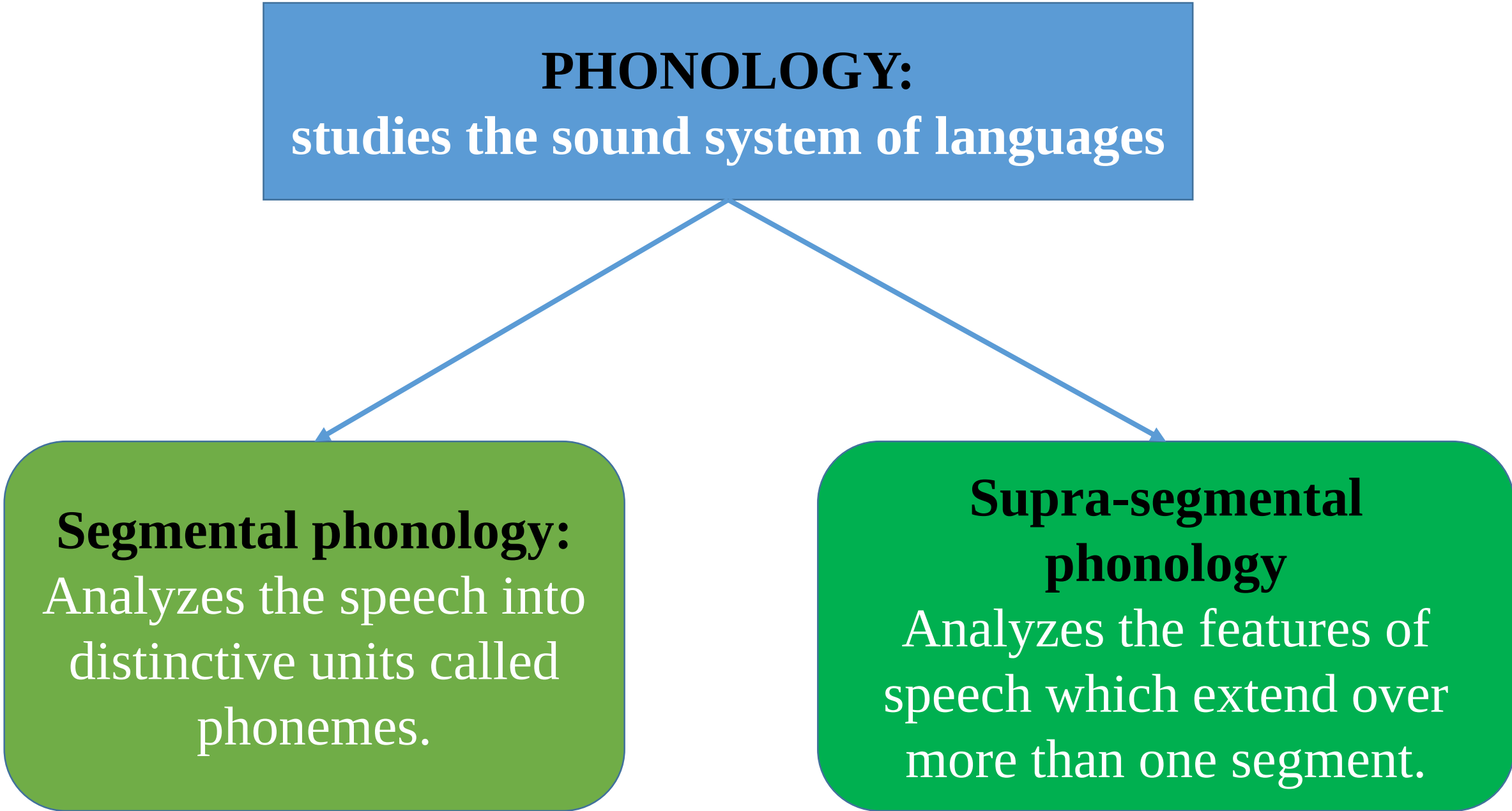


PART 2 – PHONOLOGY

Phonology

- Phonology is the branch of linguistics which studies the sound system of languages.
- The sound system of language involves:
 - The actual pronunciation of words, known as a segment or a phoneme (segmental phonology)
 - Prosody, known as the pitch, loudness, tempo and rhythm (non-segmental/supra-segmental phonology)

PHONOLOGY:
studies the sound system of languages



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graph TD; A[PHONOLOGY: studies the sound system of languages] --> B[Segmental phonology: Analyzes the speech into distinctive units called phonemes.]; A --> C[Supra-segmental phonology: Analyzes the features of speech which extend over more than one segment.]
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Segmental phonology:
Analyzes the speech into
distinctive units called
phonemes.

**Supra-segmental
phonology**
Analyzes the features of
speech which extend over
more than one segment.

Phoneme

- A **phoneme** is the smallest contrastive unit in the sound system of a language.
- In other words, a **phoneme** is the smallest unit of sound in a language which can distinguish two words.
 - ***p**an* and ***b**an* differ only in their *initial sounds*: /**p**/ & /**b**/
 - ***b**in* and ***b**a**n*** differ only their vowels (medial sounds): /**æ**/ & /**ɪ**/
- /**p**/, /**b**/, /**æ**/, /**ɪ**/ are **phonemes** of English.

Phoneme

- The **phonemes** [p] – [b] or [æ] – [ɪ] **contrast in identical environments** and are considered to be separate phonemes (the sounds which **contrast in the same environment** are called **phonemes**).
- There are **44 phonemes** in English system.
 - 20 vowel phonemes
 - 24 consonant phonemes

Minimal pairs

- When 2 different forms are identical in every way except for one sound phoneme (segment) which occurs in the same place in a string, they are called minimal pairs.
- In other words, minimal pair is two words that differ in only one sound at the same position.
- Example: **rip – lip, make – made, thin – thing**

Exercise 1: After each minimal pair, write the phonemes that are established by the sound contrast between them.

1. pin – bin → /p/ & /b/
2. late – rate
3. big – dig
4. tool – tomb
5. make - made
6. thin – thing
7. ship – sip
8. ship – sheep

Exercise 2: find the sets of minimal pair for each pair of the consonants given (contrast in initial & final position)

1. /k/ - /g/

class – glass & pick – pig

2. /tʃ/- /dʒ/

rich – ridge & choke - joke

3. /p/ - /f/

cop – cough & pan - fan

4. /s/ - /z/

Sue – zoo & Miss – Ms.

5. /s/ - /ʃ/

Sue – shoe & lass – lash

6. /m/ - /n/

met – net & beam - bean

Minimal set

- Minimal set is a group of words differentiated by each having only one sound different from all the others.
- Example: cat – hat – bat, beat – bit – but

Complementary distribution

- In phonology, complementary distribution is commonly applied to phonology, *where similar phones in complementary distribution are usually allophones of the same phoneme.*
- In other words, *two sounds are said to be in complementary distribution when they never occur in the same environment* (position).
- Example: aspirated [t^h] and unaspirated [t] are allophones of the phoneme /t/ because they occur in complementary distribution. [t^h] always occurs when it is the onset, while [t] occurs in all other situations. → **top [t^hɒp] & stop [stɒp]**

Free variation

- Free variation is *the phenomenon of two (or more) sounds or forms appearing in the same environment without a change in meaning* and without being considered incorrect by native speakers.
- In other words, *two sounds are said to be in free variation when they occur in the same environment*, but one can be substituted for the other without changing the meaning of the word.
- Example: a substitute /i:/ for /e/ in **economics** /,i:kə'nɒmiks/ or /,e:kə'nɒmiks/ does not change the meaning of the word; therefore, /i:/ and /e/ are in *free variation* in the word economics. However, /i:/ and /e/ are **not** free variation **in the other words**.

Allophone

- An allophone is a phonetic variant of a phoneme.
- Or an allophone is any of the different forms of a phoneme.

Example:

[p] and **[p^h]** are allophones of the phoneme **/p/**

[t] and **[t^h]** are allophones of the phoneme **/t/**

Phonemic transcription & Phonetic transcription

- **Phonemic transcription** is a method of transcribing words according to which every speech sound must be identified as one of the phonemes and written with the appropriate symbol. Phonemic symbols are enclosed within slant brackets // (**broad transcription**).

→ Example: speed /spi:d/ - appear /ə'piə/
tide /taɪd/ - car /kɑ:/

Phonemic transcription & Phonetic transcription

- **Phonetic transcription** is another method of transcribing words that is much more accurate in phonetic detail and contains much more information than a phonemic transcription. A lot of diacritics marks that modify the symbol in some ways, are often used in this transcription. Phonetic symbols are enclosed within square brackets **[]** (**narrow transcription**).

→ Example: speed **[spi:d]** - appear **[ə'pʰɪə]**
tide **[tʰaɪd]** - car **[kʰɑ:]**

Phonological rules

1. Clear [l] occurs before a vowel

Dark [ɫ] occurs after a vowel, before a consonant or before a pause

→ Example: **law** [lɔ:], **film** [fɪɫm]

2. Voiceless plosive [p, t, k] are strongly aspirated when they occur initial in a word or in a stressed syllable. → [p^h, k^h]

→ Example: **car** [k^hɑ:], **appear** [ə'p^hɪə]

3. Final & initial voiced plosives [b, d, g], fricatives [v, ð, z, ʒ] and affricate (dʒ) are devoiced. → [b̥, d̥, g̥, ʒ̥, ʒ̥, ɸ̥]

→ Example: **cold** [k^həʊt̥d̥]

Phonological rules

4. Nasals [m, n, ŋ], lateral [l] and approximants [w, r, j] are devoiced after initial voiceless consonants. → [ŋ̥, r̥, w̥]

→ Example: **through** [θ̥r̥u:]

5. Alveolar plosives [t, d], lateral [l] and nasals [n] are dentalized before a dental fricative (θ, ð) → [t̪ d̪]

→ Example: **tenth** [teŋ̪θ]

6. Syllabic consonants, which are also pronounced dark, only stand at the peak of an unstressed syllable instead of a vowel.

Syllabic: [n, m, l, r, ŋ] → [ŋ̩ m̩ r̩ !̩]

→ Example: **cousin** ['kʌzŋ̩]

Phonological rules

7. Nasalize a vowel (pure vowel & diphthong) before a nasal consonant ([m], [n], [ŋ])

→ Example: **born** [bɔ̃ːn], **honest** ['ɒnɪst], **them** [ðɛ̃m]

8. Shorten a vowel before a final voiceless consonant

→ Example: **great** [grɛ̃t]

[ɪ] in **bit** [bɪt] is shorter than [ɪ] in **bid** [bɪd]

[iː] in **seat** [siːt] is shorter than [iː] in **seed** [siːd]

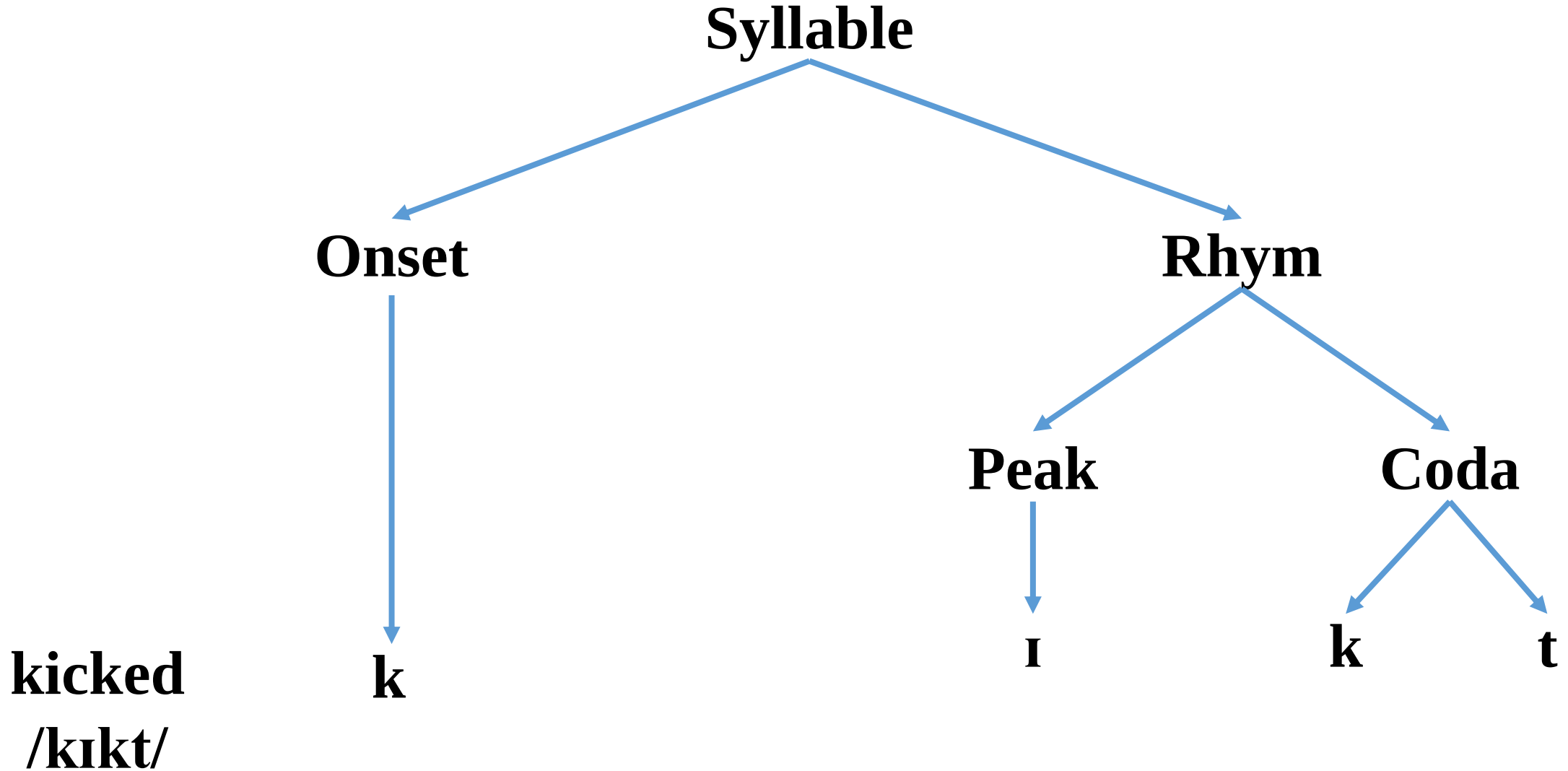
Syllable

- **A syllable** is a unit of sound composed of a **central peak** (usually a vowel) **of sonority** and **the consonants** that cluster around this central peak or nuclear.
- In other words, a syllable is a phonological unit composed of **one or more phonemes**.
- **The syllable can be looked at from two points of view:**
 - The phonetic point of view which studies the articulatory effort needed to produce syllables.
 - The phonological point of view which studies the ways sounds combine in individual languages to produce typical sequences.

Example

- **man, teeth, oak:** 1 syllable
- **manner, symbol, contain:** 2 syllables
- **banana, determine:** 3 syllables

Structure of a syllable



Onset

- **Example:**

on – no onset

high /**h**aɪ/ – 1 consonant

stay /**st**eɪ/ – 2 consonants

street /**str**i:t/ – 3 consonants

- **Structure:**

Pre-initial	Initial	Post-initial
s	any consonants, except /ŋ/	l, r, w, j

Coda

- **Example:**

no – no coda

run /rʌ**n**/ – 1 consonant

twelve /twel**v**/ – 2 consonants

twelfth (12th) /twel**fθ**/ – 3 consonants

twelfths (five-twelfths: 5/12) /twel**fθs**/ – 4 consonants

- **Structure:**

Pre-final	Final	Post-final 1	Post-final 2
l m, n, ŋ s	any consonants, except /h/	θ s, z t, d	s t

Example

- twelve /**twelv**/
- Onset: **tw** → **t**: initial
→ **w**: post-initial
- Peak: **e**
- Coda: **lv** → **l**: pre-final
→ **v**: final

Aspects of connected speech

- Strong & weak form
- Assimilation
- Elision
- Linking

Weak form

Almost all the words which have both a strong and weak form belong to a category which may be called **function words**.

These words are in certain circumstances pronounced in their strong forms but which are more frequently pronounced in their weak form.

The strong forms of these words are used in the following cases:

Rules of weak forms

- For many weak-form words, when they occur at the end of the sentence, it has the strong form.

Ex: Chips are what I'm fond **of**.

- When a weak-form is being contrasted with another word.

Ex: The letter **from** him, not **to** him.

- When a weak-form word is given a stress for the purpose of emphasis.

Ex: You **must** give me more money.

- When a weak-form word is being “cited” or “quoted”

Ex: You shouldn't put “**and**” at the end of a sentence.

Content words are emphasised

- *nouns* (lion, song, Jason)
- *main verbs* (do, walk, listen)
- *adjectives* (best, tall, little)
- *adverbs* (quietly, often, really)
- *question words* (who, what, when, where, how, why)
- *demonstrative pronouns* (this, that, these, those)

Function words are not emphasised

- *pronouns* (he, she, it, they)
- *prepositions* (in, on, of, at)
- *articles* (a, an, the)
- *"to-be" verbs* (am, is, are, was)
- *"to-have" verbs* (has, have, had)
- *conjunctions* (and, but, so, since)
- *auxiliary verbs* (do, can, may, will)

Assimilation

```
graph TD; A[Assimilation] --> B[Direction change]; A --> C[Consonant change]; B --> D[Progressive assimilation]; B --> E[Regressive assimilation]; B --> F[Reciprocal assimilation]; C --> G[Place of articulation]; C --> H[Manner of articulation]; C --> I[Voice]
```

Direction change

Consonant change

Progressive
assimilation

Regressive
assimilation

Reciprocal
assimilation

Place of articulation

Manner of articulation

Voice

Direction change

- ***Regressive assimilation:***

The phoneme that comes first is affected by the one that comes after it.

Example:

bright color /brai**k** kalə/

light blue /lai**p** blu/

- ***Progressive assimilation:***

The phoneme that comes first affects the one that comes after it.

Example:

cats kæts ← **voiceless /t/ takes /s/**

dogs dagz ← **voiced /g/ takes /z/**

- **Reciprocal assimilation**

There is a mutual influence between the two phonemes. The two phonemes can blend completely and create a different one.

Example:

$$/t/ + /j/ = /tʃ/$$

Consonant change: Place of Articulation

Alveolar + Bilabial -> bilabial	/t/ become /p/ before bilabials	might put [maɪppʊt]
	/d/ become /b/ before bilabials	should make [ʃʊbmek]
	/n/ become /m/ before bilabials	gone past [gɒmpa:st]
Alveolar + velar -> Velar	/t/ become /k/ before /k/ and /g/	might come [maɪkɪkɪm]
	/d/ become /g/ before /k/ and /g/	should come [ʃʊgkɪkɪm]
	/n/ become /ŋ/ before /k/ and /g/	one cup [wʌŋkʌp]

Consonant change: Place of Articulation

Alveolar + dental -> dentalised		cut through [kʌt̪ θru]
Alveolar+palato-alveolar/ palatal-> palato	/s/ become /ʃ/ before /j/ or /j/	nice shoes [naiʃfuz]
	/z/ become /ʒ/ before /j/ or /j/	where's yours [wɛrʒjɔrz]
	alveolar stop and /ʒ/ creates affricate	want you [wantʃu]

Assimilation of manner

- Only regressive assimilation of alveolar consonant

1. Plosive + fricative → fricative

- /t/ + /s/ → /s/ : that side [ðæssaɪd]
- /t/ + /z/ → /z/ : that zoo [ðæzzu:]
- /d/ + /s/ → /s/ : good song [gʊssɒŋ]
- /d/ + /z/ → /z/ : bad zone [bæzzəʊn]

2. Plosive + nasal → nasal

- /t/ + /n/ → /n/ : that night [ðænnait]
- /d/ + /n/ → /n/ : good night [ɡunnait]

Note: /ð/ follow a plosive or nasal at the end of a preceding word

Eg: get them /get ðəm/ → /gettəm/

in the /in ðə/ → /innə/

Rules of elision

a. Aspirated stops + weak vowel /ə/ → aspirated

stops

- Today [t^hdeɪ]
- potatoes [p^hteɪtəʊ]

b. Weak vowel /ə/ disappears before syllabic

consonants / n, l, r /

- Canal [k_ɪnæl]
- correct [k_ɪrekt]
- connect [k_ɪnekt]

Rules of elision

c. Avoidance of complex consonant cluster:

Stop + (stop) + stop

looked back [lukt° bæk]

stopped killing [stɒpt° kɪlɪŋ]

Stop + (stop) + fricative

Acts [ækt° s]

scripts [skript° s]

d. Loss of /v/ in “of” before consonant

Example:

Lots of them [lɒtsədəm]

Waste of money [weɪstəmʌni]

Linking

Linking is the phenomenon where words or sounds are linked together. There are 5 basic rules of linking.

Rules of linking:

1. Linking final consonant to initial vowel

- Drink a cup of tea [drɪŋkə kʌpəti:]
- Put it on [pʊtɪtən]

2. Linking identical consonants

- Bad dog [bæddɒg]
- stop pushing [stɒppʊʃɪŋ]
- big girl [bɪggɜ:l]
- good deal [gʊddi:l]
- this seat [ðɪssi:t]
- felt tired [felttaɪəd]



Linking

c. Linking / r / and intrusive / r /

- Four eggs [fɔːregz]
- your eyes [jɔːraɪz]
- for ever [fɔːrevə]
- Media events [miːdiərɪvents]
- Australia and Africa [ɒstreɪliərənæfrɪkə]

d. Intrusive / j / : when a word ending in /iː ; ɪ ; aɪ ; eɪ ; ɔɪ/ is followed by a word beginning with a vowel

- The other [ðɪˈləðə]
- my aunt [maɪˈaʊnt]
- see us [siːjəs]

e. Intrusive / w / : when a word ending in /uː ; ʊ ; aʊ ; əʊ/ is followed by a word beginning with a vowel

- Go in [gəʊˈwɪn]
- two others [tuːˈwʌðəz]

Review

Assimilation

- Assimilation of place

/t/ → /p/ before /p, b, m, w/

/d/ → /b/ before /p, b, m, w/

/n/ → /m/ before /p, b, m, w/

/t/ → /k/ before /k, g /

/d/ → / g / before /k, g /

/n/ → / ŋ / before /k, g /

/s/ → /ʃ/ before /ʃ, j/

/z/ → /ʒ/ before /ʃ, j/

Assimilation

- Assimilation of manner

/t, d/ → /s/ before /s/

/t, d/ → /z/ before /z/

/t, d/ → /n/ before /n/

/t/ → [t̚] before /θ, ð/

/d/ → [d̚] before /θ, ð/

/n/ → [n̚] before /θ, ð/

/t, d, n/ + /ð/ = /t, d, n/

Assimilation

- Assimilation of voicing

C^f : alveolar fricative voiced (v, z, ð, ʒ) $\rightarrow$ C^i : alveolar fricative voiceless (f, s, θ, ʃ)

Reciprocal assimilation

$/d/ + /j/ = /dʒ/$

$/t/ + /j/ = /tʃ/$

$/s/ + /j/ = /ʃ/$

$/z/ + /j/ = /ʒ/$

- | | |
|------------------|------------------|
| 1. That person | 11. Card game |
| 2. That man | 12. Green paper |
| 3. Meat pie | 13. Fine thought |
| 4. That thing | 14. Bad things |
| 5. Get those | 15. Ten girls |
| 6. Cut through | 16. This shoes |
| 7. That case | 17. Those years |
| 8. Bright colors | 18. That side |
| 9. Quite good | 19. Good night |
| 10. Good boy | 20. Don't you |

1. They came to that side.
2. What are you surprised at?
3. Who will meet that man at the airport?
4. She has an uncle and a cousin.
5. There are two of them.
6. I shall be angry.
7. More than I can.
8. What can I do?
9. She is as old as the hill.
10. That person was pleased, wasn't he?