Syllables

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Learning Outcomes

- Describe major constituents of English syllables,

- Analyse and illustrate the structure of English syllables in tree diagrams.
What is a Syllable?

- In articulatory terms, the production of a syllable involves one burst of muscular energy, i.e. a ‘chest pulse’.

- Different languages have different kinds of syllable structure.
- In English however, syllables differ in duration depending on the degree of stress of the syllables.

- Every English word consists of at least 1 syllable e.g. ‘cat’ /kæt/, ‘dog’ /dɔɡ/.

- Many English words have 2,3,4 or more syllables; e.g. ‘mother’, ‘photograph’, ‘photographer’, ‘lackadaisical’.
In discussing syllables, we are concerned with 2 kinds of facts:

1. the *structure* of a syllable

2. the *relative prominence* of syllables when 2 or more occur in sequence
Every syllable has a structure, a sequence of some of the phonemes of the language; e.g. ‘cat’ comprises /k/, /æ/, /t/.

A syllable is comprised of 2 main constituents: *onset* & *rhyme*.

*Rhyme* is further broken down into *nucleus* & *coda*. 
A syllable structure can be represented in a tree diagram:

Example:

```
   σ
  /   \
onset   rhyme
        /   \
     nucleus   coda
          /     \
      (peak, centre)

pain - /p/ /ei/ /n/
```
Morphemes which contain only one syllable are called *monosyllabic*.

In English, morphemes may contain more than 1 syllable: *polysyllabic*

Every English syllable has a centre called NUCLEUS or PEAK (+ syllabic)

The nucleus is usually made up of a vowel; the sonorant consonants /m, n, η, l, r/ can become syllabic in certain positions.

e.g. [prɪzm] prism; [btn] button
- The peak may be preceded by 1 or more consonants (non-syllabic elements), which constitute the ONSET.
- The peak may be followed by 1 or more consonants (non-syllabic elements) that constitute the CODA.

e.g. (1) ‘cat’: onset - /k/
peak - /æ/
coda - /t/

(2) ‘tree’: onset - /tr/
peak - /iː/
no coda - (zero coda)

(3) ‘ox’: onset - zero
peak - /ɒ/
coda - /ks/
- A syllable containing one or more consonants in coda position is called a *closed* syllable,

  e.g. /teɪl/ tail, /krʌst/ crust

- A syllable without any consonants in coda position or ending with a vowel is an *open* syllable,

  e.g. /bæɪ/ by, bye; /ə:/ are
In a syllable,

- The nucleus is **obligatory**.
- The onset & coda are **optional**.
- In English, there are never more than 2 vowels in sequence in a single word, e.g.:
  
  ‘neon’  /niːɒn/
  ‘poet’  /pəʊɪt/  - a diphthong + single vowel
  ‘cruel’ /kruːəl/
Phonotactic Constraints

- Defines what sound combinations may & may not occur in a language.

- Every language has its own unique set of phonotactic constraints.

[Please refer to handout on *English Syllable Structure* (Carr, P. 2001)]
- *Phonotactics* studies & describes the limitations or constraints on co-occurrence of consonants/vowels (what sequences may or may not occur in a word).

- Clusters of 2, 3 or 4 consonants are fairly common; e.g.,

  - *prescribe* /prɪskraɪb/
  - *splints* /splɪnts/
  - *tempts* /tempts/
Examples of Phonotactic Constraints in English

- [ŋ] occurs only in syllable-final position, e.g. /sɪŋ/, /wɪŋ /

- [h] occurs only in syllable-initial position, e.g., happy /hæpi/

- Word/syllable medial position must be a vowel (or sonorant consonant)

- In word/syllable initial position: only specific types of consonant clusters, e.g.:
  - s + voiceless plosive + liquid, e.g. str, spl, skr, etc.
  - s + sonorant, e.g., sm, sn, sl
  - plosive + sonorant, e.g., pl, pr, tr

- Any consonants, except for [h, r, w, j] may be final consonants in a syllable/word
- **Canonical forms** - designations of words by writing the class name (vowel, glide, liquid, plosive, etc.) to which each phoneme of a word belongs; e.g.,

  shrimp /ʃrɪmp/ designated as FLVNP
  quilt /kwɪlt/ designated as PGVLP

- Canonical forms enable us to describe the possible shapes of syllables, morphemes & words in a language & to compare the shape of 2 or more words or syllables.
- Canonical forms can be indicated with full information about classes (V, G, L, N, F, P) or by indicating general classes: vowels & consonants (CVC);

  e.g. ‘neon’/ni:ən/ - CVVC or NVVN
  ‘poet’ /pəʊət/ - CVVC or PVVP

- For a *polysyllabic* word, the canonical form must include an indication of stress;

  e.g. comic /ˈkɒmɪk/ - CVCVC
  bucket /ˈbʌkɪt/ - CVCVC
In English, a canonical form CVC (e.g. nut /nʌt/, sack /sæk/) is more common than CVCV VCV (tapioca /tæpiəʊka/).

A one syllable word may have one vowel, which may be initially positioned (and /ænd/); preceded by one consonant (band /bænd/), 2 consonants (bland /blænd/), or 3 consonants (strand /strænd/), but no more.

In a word without suffix, the vowel may be final (go /gəʊ/) or followed by one consonant (goat /ɡeʊt/), 2 consonants (toast /təʊst/), 3 consonants (corpse /kɔːrps/), or 4 consonants (glimpsed /ɡlɪmpt/), but no more.
All possibilities for a monosyllabic, monomorphemic word can be expressed in this structural formula:

\[ C \ V \ C \quad \text{or} \quad CCC \ V \ CCCC \]

i.e. it consists of 1 vowel preceded by from 0 to 3 consonants & followed by from 0 to 4 consonants.
Exercise

1. Find examples of permissible consonant clusters in both initial and final positions in English.

2. Based on your knowledge of English, write down as many phonotactic constraints for English as possible.
Empty onset

- Examples: It
Branching Onset

- Example: Clip

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\[\text{O} \quad \text{S} \quad \text{R} \quad \text{C} \quad \text{N} \quad \text{l} \quad \text{k} \quad \text{i} \quad \text{p}\]
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Branching codas

- Examples: Hunt
**Branching nucleus**

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Skeletal tier
Complex segments

• Example: chip
Sonority Scale

- Sonority scale
  - Low vowels
  - High vowels
  - Approximants
  - Nasals
  - Voiced fricatives
  - Voiceless fricatives
  - Voiced stops
  - Voiceless stops
Sonority Scale (cont’d)

Principle of **Maximal Onset**

e.g., Appraise - /əprɪəɪz/

- Question: Where are the boundary between the syllables lies?
  /ə.pɾɪəɪz/, or /əp.ɾɪəɪz/

- It is the syllabification which maximizes the material in the following onset which is preferred.
- Appraise
Sonority Scale (cont)

- The most ‘basic’ syllable structure in human languages is CV syllable structure, with a single onset consonant followed by a vowel.
Sonority Scale (cont)

- This generalization about CV syllable structure probably has a basis in both articulation and perception.
Onset constraints

- Ignoring the /s/ + consonant cases,
- We may say that the first segment must be a stop and second segment must be
  - /ɪ/, /l/, /j/, or /w/.

- Thus /pɪ/, /pl/, /pj/, /bɪ/, /bl/, /bj/, /tɪ/, /tw/, /dɪ/,
  /dw/, /kɪ/, /kl/, /kw/, /θɪ/, /θw/, /fɪ/, /fl/, /fj/, /sl/, /sj/,
  and /sw/ are all permissible.
Onset constraints (cont)

- This list reflects other onset phonotactics.

- For instance, /t/, /d/ and /θ/ may not be followed by /l/, and none of the voiced fricatives may occur in branching onsets.
WASN’T THAT FUN?

Do read up!