Advanced Phonetics and Phonology

1302741

Lecture (9)

The Syllable
The concept of syllable is a unit at a higher level than that of the phoneme or sound segment, yet distinct from that of the word or morpheme (Gimson, 1975:51).

A syllable is plainly a unit of sound that is larger than a single segment and usually smaller than a word, but it is not always easy to define the number of syllables in a word or to identify where one ends and the next begins (Crystal, 2006:71).
Phonetically syllables “are usually described as consisting of a centre which has little or no obstruction to airflow and which sounds comparatively loud; before and after that centre (...) there will be greater obstruction to airflow and/or less loud sound” (Roach, 2000: 70).

In the monosyllable (one-syllable word) *cat* /kæt/, the vowel /æ/ is the “centre” at which little obstruction takes place, whereas we have complete obstruction to the airflow for the surrounding plosives /k/ and /t/.

Phonologically, this involves the possible combinations of English phonemes (or phonotactics). Laver (1994: 114) defines the phonological syllable as “a complex unit made up of nuclear and marginal elements”. Nuclear elements are the vowels or syllabic segments; marginal elements are the consonants or non-syllabic segments.

In the syllable *paint* /peɪnt/, the diphthong /eɪ/ is the nuclear element, while initial consonant /p/ and the final cluster /nt/ are marginal elements.
Theories of Syllable Prominence Theory

- Attempts have been made to provide physiological, acoustic or auditory explanations and definitions of the syllable.

- According to the **prominence theory**, for example, which is based mainly on auditory judgements, the number of syllables in a word is determined by the number of peaks of prominence. In the word *entertaining* /ˌentəˈteɪnɪŋ/ the peaks of prominence are represented by the vowels /e ə eɪ i/.

- However, this theory does not help much in discussions of syllable division.
Theories of Syllable
Chest Pulse Theory

- The chest pulse theory discusses the syllable in the context of muscular activities and lung movements in the process of speech.
- Experiments have shown that the number of chest pulses, accompanied by increase of air pressure can determine the number of syllables produced (Gimson, 1975: 56), thus allowing to associate the number of syllables with the number of chest pulses.
- This approach, however, cannot account for cases when two vowels occur one after the other – for example in words like being /ˈbiːɪŋ/ or playing /ˈpleɪɪŋ/ the second chest pulse might be almost irrelevant and thus lead erroneously to the conclusion that such English words consist of one syllable only.
Theories of Syllable Sonority Theory

- Another approach is presented by sonority theory according to which the pulses of pulmonic air stream in speech “correspond to peaks in sonority” (Collins & Meer, 2008:283).

- The sonority of a speech sound is discussed as “its relative loudness compared to other sounds” and each syllable corresponds to a peak in the flow rate of pulmonic air. Thus nuclear elements, or syllabic segments can be described as intrinsically more sonorous than marginal, or non-syllabic elements.

- Speech sounds can be ranked in terms of their intrinsic sonority according to a sonority scale. According to the sonority hierarchy sounds are organized as follows, from the least to the greatest: voiceless obstruents, voiced obstruents, nasals, liquids, glides, and vowels.
Sonority

The Syllable is a unit of spoken language consisting of a single uninterrupted sound formed generally by a vowel and preceded or followed by one or more consonants.

- Vowels are the heart of a syllable (Most Sonorous Element)
- Consonants act as sounds attached to vowels.
Sonority

• Loudness is also a highly context-dependent measure.
  
  • Can vary wildly within speaker, from speaker to speaker, from room to room, and across speaking contexts.

• However, all things being equal, some speech sounds are louder than others.

• Course in Phonetics:

  “The sonority of a sound is its loudness relative to that of other sounds with the same length, stress and pitch.”
From Ladefoged

**FIGURE 10.1** The relative sonority of a number of the sounds of English.
A Sonority Scale

LOW VOWELS
HIGH VOWELS
GLIDES
LIQUIDS
NASALS
FRICATIVES
STOPS

high sonority

low sonority
Sonority Sequencing

- The sonority profile of the syllable is regulated by a universal principle:

  The Sonority Sequencing: The sonority profile of the syllable must rise until it peaks, and then fall.

- So, an onset such as ls, the converse of existing sl, would violate the Sonority Sequencing Principle.
Sonority and Syllables

• An old idea (e.g., Pike, 1943): syllables are organized around peaks in sonority.

• This is the **Sonority Sequencing Principle** (SSP).
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Sonority Hierarchy [sli:p]
Sonority Hierarchy *[lsi:p]*
Some basic principles

• Onsets must rise in sonority towards the syllable peak.

Examples:

stop - {liquid/glide} ‘play’ ‘quick’
fricative - {liquid/glide} ‘fling’ ‘thwack’
[s] - {liquid/nasal/glide} ‘slide’ ‘snow’ ‘sweet’

• What onset clusters should be ruled out?

• Can you think of any English examples where this principle might not work?
Some basic principles

• Codas must **drop** in sonority away from the syllable peak.

Examples:

nasal - {fricative/stop}  ‘ tenth ’ ‘ hand ’

liquid - {fricative/nasal/stop}  ‘ help ’ ‘ helm ’ ‘ heart ’

fricative - stop  ‘ test ’

• What coda clusters should be ruled out?

• Can you think of any English examples where this principle might not work?
The Core Syllable

- Basic structure *(the Core Syllable)* - CV

- The core syllable is made up of a Nucleus preceded by an Onset:

\[
\sigma \\
\downarrow \\
O(\text{onset}) \quad N(\text{ucleus}) \\
\quad \downarrow \\
C \quad V
\]
The Core Syllable

- Some languages only have CV syllables.
- More commonly, languages allow for syllables of greater complexity.
- The core syllable is, however, found in every language.
**Vowel and Consonant Structures for English Syllables**

- V: awe /ɔː/:/
- CV: saw /sɔː:/
- VC: ought /əːt /
- CVC: soon /suːn/
- CVCC: runs /rʌnz /
- CCV: draw /drɔː:/
- CCVC: drawn /drɔːn/
- CCCVC: straw /strɔː:/
- CCCVCCC: strands /strændz /
- CCVCCCCC: glimpsed /ɡlimpst/
Syllable Branching

Many phonologists envisage BRANCHING HIERARCHICAL syllable structure. Katamba (1989:153f) presented a revamped version of MULTI-TIERED PHONOLOGICAL THEORY. The syllable consists of Onset, Peak and Coda each may further be branched into two C- or V- constituents respectively. Then we speak about branching or complex Onsets etc. The English syllable *drowned* /draʊnd/ is an example in which all three elements branch.

As can be seen from the diagram, diphthongs are treated as branching Peaks – each element of the diphthong occupies a single V-slot. The case is quite similar with “long vowels”: in terms of syllable structure, they are interpreted as sequences of two identical V-elements – /i:/ is represented as $V_1 = [i] + V_2 = [i]$, and /aː, ɔː, ɜː, ʊː/ are [a+a, ɔ+ɔ, ɜ+ɜ, u+u], respectively.
Closed And Open Syllables

- Syllables ending in a consonant, e.g. *cat* /kæt/, *it* /ɪt/, *eat* /iːt/, are traditionally known as closed syllables, whereas those ending in a vowel, as in *sea* /siː/ or *eye* /aɪ/, are called open. In terms of syllable structure, in closed syllables the Coda is present, i.e. we have a branching Rhyme, while open ones have non-branching Rhymes – the Coda element is absent. Syllable Onset is irrelevant to this distinction.
Strong And Weak Syllables

- Any syllable with a vowel (except /ə, ɪ, u/) as its peak or nucleus is **strong**. If the vowel is short, then the **strong** syllable will always have a coda as well, as in seat /si:t/ and in /ɪn/.

- **Strong** syllables are stressed.

- A **weak** syllable can only have one of a very small number of possible peaks as in ‘postman’ /pəʊstmən/.

- At the end of a word, we may have a weak syllable ending with a vowel (i.e., with no coda), as in ‘better’ /betə/, ‘happy’ /hæpɪ/, and ‘thank you’ /θæŋk ju/.

- We also find weak syllables in word-final position with a coda if the vowel is /ə/, as in ‘open’ /ˈɔpən/. **Weak** syllables are unstressed.
Syllabification

- Syllabification or syllabication is the separation of a word into syllables, whether spoken or written.
- In some languages, the spoken syllables are also the basis of syllabification in writing.
- However, possibly due to the weak correspondence between sounds and letters in the spelling of modern English, written syllabification in English is based mostly on etymological or morphological instead of phonetic principles.
- For example, it is not possible to syllabify "learning" as *lear---ning* according to the correct syllabification of the living language.
Syllable Structure: a more detailed look

- Count of no. of syllables in a word is roughly/intuitively the no. of vocalic segments in a word.
- Thus, presence of a vowel is an obligatory element in the structure of a syllable.
- Basic Configuration: (C)V(C).

\[
\begin{array}{c}
\text{S} \\
\text{O} \\
\text{R} \\
\text{N} \\
\text{Co}
\end{array}
\]

S ≡ Syllable, O ≡ Onset
R ≡ Rhyme, N ≡ Nucleus
Co ≡ Coda
Syllable Structure: Examples

- ‘word’

- ‘sprint’
Syllable Structure: Examples

- **‘may’**
  - No Coda.

- **‘opt’**
  - No Onset.

- **‘air’**
  - No Coda, No Onset.
The CV-tier

- the CV tier, a kind of phonological structure that is ‘above’ the root node.

- The CV tier is above the root node in the sense that root nodes are dependents of, or dominated by, this type of structure.

- Different types of evidence will be used to motivate and explicate this type of structure, which will be used as a general introduction to higher level prosodic structure.
The CV-tier

[9.5] (a)

\[ \begin{array}{c}
\sigma \\
C & V \\
\text{m & u & n & t & u} \\
\end{array} \] \\
\begin{array}{c}
\sigma \\
C & C & V \\
\end{array} \\
\text{‘person’ (Luganda)}

(b)

\[ \begin{array}{c}
\sigma \\
V & C & V \\
\text{\_m & e & r & i & k & n} \\
\end{array} \] \\
\begin{array}{c}
\sigma \\
C & V \\
\end{array} \\
\text{American}
There are still problems with phonetic description. Most speakers of English feel that ‘going’ /gəʊɪŋ/ consists of two syllables: Roach (2000:77) states that most speakers could decide on phonetic grounds that the /ʊ/ in the middle is the dividing point between the two syllables, since the articulation is slightly closer to obstructing airflow than the vowel next to it.

Another difficulty can be seen in ‘extra’ /ɛkstrə/. One problem is that by some definitions the /s/ in the middle, between /k/ and /t/, would be counted as a syllable, which most English speakers would reject. The most controversial issue relates to where the two syllables are to be divided:

1. i- /ɛ-kstrə/
2. ii- /ɛk-strə/
3. iii- /ɛks-trə/
4. iv- /ɛkst-rə/
5. v- /ɛkstr- ə/
This principle states that where two syllables are to be divided, any consonants between them should be attached to the right-hand syllable, not the left as far as possible within the restrictions governing syllable onsets and codes. This principle will reject the first and fifth options of ‘extra’, leaving us with the other three ones (ii, iii, and iv). Roach (2000:78) under the maximum onsets rule chooses (ii) /ek-stra/. Thus, the syllable is the basic phonotactic unit following particular phonotactic rules or morpheme structure conditions (Katamba, 1989:164f).
Maximal Onset Principle

[9.11] (a)

V-elements are pre-linked with $\sigma$ by convention [9.10a]

(b)

By convention [9.10c] link C-elements to the $V$ preceding them so long as the resulting sequence is allowed in the language.
Maximal Onset Principle

“The Intervocalic consonants are maximally assigned to the Onsets of syllables in conformity with Universal and Language-Specific Conditions.”

- Determines underlying syllable division
- Example: televizor
Ambisyllabic

- When one consonant stands between vowels and it is difficult to assign the consonant to one syllable or the other, as in ‘better’ /betə/ or ‘carry’ /kærɪ/.

- Roach (2000:78) states that the consonant belongs to both syllables. Phonologists used the term ambisyllabic for a consonant in this situation.
Ambisyllabic

- When one consonant stands between vowels and it is difficult to assign the consonant to one syllable or the other, as in ‘better’ /betə/ or ‘carry’ /kæri/.
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![Diagram showing the pronunciation of 'butter', 'camel', 'upper', and 'Lenny' with ambisyllabic consonants marked.](image)
Syllabic Consonants

- A consonant is syllabic when (l), (r), or a nasal stands as the peak of the syllable instead of the vowel.
- It is usual to indicate that a consonant is syllabic by means of a small vertical mark (ʼ), as in:
  - Cattle /kætɬ/
  - Happen /hæpŋ/ and sometimes /hæpɭŋ/
  - Broken key /brəukŋ kiː/
  - Hungary /hʌŋɡɾi/
Morpheme Boundary Condition

- Morpheme boundaries such as those between the elements of a compound normally the /p/ of *fee-paying* to remain initial in the second syllable, so that there is no pre-fortis shortening of the /i:/ (compare *deep*).

- The same applies in *reprint* (n.) /ˈriːprɪnt/ (compare *reaper* /ˈriːp.ə/) and *presuppose* /ˌpriːsəˈpəʊz/ (compare *priest* /priːst/).

- There is pre-fortis shortening of the /aɪ/ in *hyphen* /ˈhaɪfən/, but not of that in *high-faluting* /ˈhaɪ.foʊ.ˈluːtɪŋ/. We need the following as a condition on the main principle:

- In polymorphemic words, consonants belong to the syllable appropriate to the morpheme of which they form a part.
The main syllabification principle does not operate in such a way as to lead to consonant clusters which are phonotactically ill-formed, according to the phonotactic constraints (Wells, 1990:76):

Phonotactic constraints on syllable structure (as established with reference to monosyllables) are not violated.

This means, for example, that *timber* is syllabified as /ˈtɪm.bə/, since /mb/ is not a possible final cluster: /b/ cannot be captured into the stressed syllable.

Similarly, *anger* is /ˈæŋ.gə/, at least in RP. But *tender* is /ˈtend.ə/, /nd/ being a permitted cluster. Notice how neatly this fits with permitted initial clusters: *tumbler* /ˈtʌm.blə/, *English* /ˈɪŋ.glɪʃ/.
Functions of the Syllable

1. The constitutive function: syllables constitute words: through the combination of their stress- loudness, duration- length, pitch-tone.

2. The distinctive function: the difference in the place of a syllabic boundary differentiates the meanings of the words and phrases:

   e.g. a 'name – an ´aim      my 'train - might 'rain

The identificatory function: the listener can understand the exact meaning of the utterance only when the correct syllabic boundary is perceived: e.g. peace talks - pea stalks
Functions of the Syllable

1. The syllable as the basic phonotactic unit

<table>
<thead>
<tr>
<th>*tleg</th>
<th>(compare [butleg] bootleg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>*ndaɪz</td>
<td>(compare [mætsəndaɪz] merchandise)</td>
</tr>
<tr>
<td>*bmit</td>
<td>(compare [səbmit] submit)</td>
</tr>
<tr>
<td>*psɪŋ</td>
<td>(compare [kɛlæpsɪŋ] collapsing)</td>
</tr>
</tbody>
</table>

The rules which reflect speakers' knowledge of what combinations of sounds are allowed in their language are variously referred to as PHONOTACTIC RULES or MORPHEME STRUCTURE CONDITIONS.
Functions of the Syllable

2. The syllable as the domain of phonological rules

nasalisation rule of French (which is similar to a nasalisation rule found in numerous languages):

\[ V \rightarrow [+\text{nasal}] / \_N \{C\} \# \]

Vowels are nasalised when followed by a preconsonantal nasal as in /enfle/ [ãfle] enfle 'swollen' or word-finally as in /bon/ [bɔ] bon 'good'.
Functions of the Syllable

2. The syllable as the domain of phonological rules

\[ V \rightarrow [+\text{nasal}] / -\text{N} \{C\} \]

\[ [9.16] \quad \text{UR: /grand/} \]

Rule a

Vowel nasalisation before syllable-final NC:

\[ \text{grand} \rightarrow \text{gr\text{"a}nd} \text{ (see [9.15])} \]

Rule b

Consonant deletion: \[ \text{gr\text{"a}nd} \rightarrow \text{gr\text{"a}} \text{ (see [7.4])} \]

PR \[ \text{[gr\text{"a}]} \]

(Note: rules a and b may apply simultaneously as the underlying representation satisfies the structural descriptions of both rules.)
Functions of the Syllable

2. The syllable as the domain of phonological rules

Californian language Yawelmani.
In this language consonant clusters are allowed only if they do not exceed two consonants.

\[
\begin{align*}
\text{[9.17] root – aorist} & \quad /\mathbf{\varphi}l\mathbf{\varphi}k - \text{hin/} \rightarrow /\mathbf{\varphi}l\mathbf{\varphi}kh\mathbf{\varphi}n/ \quad \text{‘sang’} \\
& \quad /\mathbf{p}a\mathbf{\varphi}\mathbf{\varphi}t - \text{hin/} \rightarrow /\mathbf{p}a\mathbf{\varphi}\mathbf{\varphi}th\mathbf{\varphi}n/ \quad \text{‘fought’} \\
& \quad (\mathbf{t} \text{ is retroflex})
\end{align*}
\]

\[
\begin{align*}
\text{[9.18] root – dubitative} & \quad /\mathbf{\varphi}l\mathbf{\varphi}k - \text{al/} \rightarrow /\mathbf{\varphi}l\mathbf{k}\mathbf{\varphi}l\mathbf{\varphi}l/ \quad \text{‘might sing’} \\
& \quad /\mathbf{p}a\mathbf{\varphi}\mathbf{\varphi}t - \text{al/} \rightarrow /\mathbf{p}a\mathbf{\varphi}t\mathbf{\varphi}l/ \quad \text{‘might fight’}
\end{align*}
\]
Functions of the Syllable

3. The syllable and the structure of complex segments

One of the main functions of the syllable is to provide an analysis of the internal structure of segments and to indicate the number of rhythmic units present in a syllable. This depends on the way C and V elements present on the CV-tier are linked with consonant and vowel segments on the segmental tier (Hyman 1985).
Functions of the Syllable

3. The syllable and the structure of complex segments

(a) A one-to-one association of V or C with a segment:

```
[9.19] Syllable-tier

CV-tier

segmental-tier
```

```
C

V

C

[−cont −voice +labial −low]

[+syll −back −high +ant −cor]

p
c
n
```
Functions of the Syllable

3. The syllable and the structure of complex segments

Simultaneous association of one segment with two C or V slots. That is the case when consonants are GEMINATED (i.e. the same consonantal articulation is held for the duration of two consonantal beats) or when a vowel is lengthened (i.e. the same vowel quality is maintained over two V slots). I represent both possibilities with a Luganda example in [9.20]. The word ttaala [t:a:la] 'lamp', begins with a geminate t followed by a geminate vowel.

[9.20]

(a) C C
    t

(b) V V
    a

C V
3. The syllable and the structure of complex segments

The third possibility is the simultaneous association of a single C slot with two segmental distinctive feature matrices. This is what happens when complex segments like affricates occur. Affricates like [pf], [tf] and [dʒ] are described using the feature [+delayed release] in SPE (see section J.J.6). But they can be more revealingly represented in this way:

[9.21]

```plaintext
<table>
<thead>
<tr>
<th>Affricates</th>
<th>Diphthong</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="tree" /></td>
<td><img src="image" alt="tree" /></td>
</tr>
</tbody>
</table>

-affricates

\[f = [t\backslash f]\]

(as in [ett] ‘eight’)

Functions of the Syllable

4. Compensatory lengthening

In many languages, if an underlying syllabic segment is deleted or is realized as nonsyllabic, an adjacent syllabic gets lengthened 'in compensation'.

Luganda in [9.24].

• /ba+a+lab+a/ → [ba:laba] 'they saw'
• (but /ba+ku+lab+a/ → [bakulaba] 'they see you')
• /ba+e+lab+a/ → [be:laba] 'they see themselves'
• /mu+a+lab+a/ → [mwa:laba] 'you saw'
• (but /mu+tu+lab+a/ → [mutulaba] 'you see us')
• /li+a to/ → [ija:to] 'boat, canoe'
• /ma+ato/ → [ma:to] 'boats, canoes'

The rule is that a high vowel is realised as a nonsyllabic glide if it appears followed by another vowel; it is delinked from a V slot and re-associated with a C slot.
Functions of the Syllable

4. Compensatory lengthening

The rule is that a high vowel is realised as a nonsyllabic glide if it appears followed by another vowel; it is delinked from a V slot and re-associated with a C slot (glide formation rule):

[9.7] Glide formation

Glide formation

\[ \sigma \]
\[ \sigma \]
\[ C \quad V \quad V \quad C \quad V \quad C \quad V \quad m \quad w \quad a : \quad n \quad a \]

‘child’ Luganda

Note: (a) a broken line is an instruction to ‘LINK’ i.e. insert new association line;
(b) an association line with two lines through it shows DELINKING i.e. termination of an association.
Functions of the Syllable

4. Compensatory lengthening

We can interpret compensatory lengthening as follows: when the first vowel is deleted or realised as a nonsyllabic glide, its V-slot (and timing unit) is inherited by the second vowel which becomes simultaneously associated with two V slots and hence has virtually the duration of two vowels in the phonetic representation:

\[ [9.25] \]

```
\[
\begin{array}{c}
\sigma & \sigma & \sigma \\
CVVC & VC & V \\
bael & aba & aba \\
\end{array}
\Rightarrow
\begin{array}{c}
\sigma & \sigma & \sigma \\
CVVC & VC & V \\
beel & aba & aba \\
\end{array}
\]
```

\[ [be:lab\alpha] \]

\[ [9.26] \]

```
\[
\begin{array}{c}
\sigma & \sigma \\
CVVC & V \\
liat\omega & \\
\end{array}
\Rightarrow
\begin{array}{c}
\sigma & \sigma \\
CVVC & V \\
lja\omega & \\
\end{array}
\]
```

\[ [lja:to] \]
Functions of the Syllable

5. The syllable as indispensable building block for higher phonological domains

In many languages, higher prosodic phenomena like stress, nasalisation, and quantity (length) can only be insightfully described in terms of the syllable because often, in order to determine whether a given rule is applicable, the number of syllables in a word (or part of a word) has to be counted.

There are rules which require main word stress to fall on a certain syllable of the word which could be, say, the last syllable or second syllable from the end (penultimate syllable) of a word.
Functions of the Syllable

5. The syllable as indispensable building block for higher phonological domains

Which syllable receives stress in the Swahili data in [9.27]?

- piga
- pigána
- piganíga
- tutawapíga
- tutawapiganíga

'hit'
'fight',
'cause to fight'.
'we shall hit them'
'we shall make them fight'

stress in Swahili falls on the penultimate syllable. The relative position of stress remains the same even when the word grows longer with the addition of affixes.
5. The syllable as indispensable building block for higher phonological domains

The noun class 9 nasal prefix in Swahili is syllabic.

This rule also takes the number of syllables in a word into account: if attached to MONOSYLLABIC roots, the nasal prefix is syllabic but if attached to longer roots, it is non-syllabic:
5. The syllable as indispensable building block for higher phonological domains

Clitics:
• Typically a clitic is an unstressed particle which is attached to a HOST (i.e. main) word and is incapable of standing on its own.
• Often clitics affect the stress pattern of the host word. A clitic attached to the beginning of a word is called a PROCLITIC and a clitic attached to the end of a word is called an ENCLITIC.
• Some ditics are derived from self-standing words. For example, the French first person pronoun form *je* (as in *je le vois 'I see him*) is an independent word. But in *j'ai* (from *je ai*) 'I have' it is a PROCLITIC.
• In English *not* is a separate word in *she is not* but it is an ENCLITIC in *she isn't*.
• Other clitics are not derived from independent words e.g. Latin *-que 'and' as in mensamque 'and the table' (accusative case).*
• The process of adding clitics is called CLITICISATION.
Functions of the Syllable

5. The syllable as indispensable building block for higher phonological domains

**Clitics:** in Luganda, all monosyllabic roots end in a long vowel in the underlying representation. That long vowel is shortened in most contexts in the phonetic representation. But it is protected and shows up before enclitics like the interrogative marker as you can see:

<table>
<thead>
<tr>
<th>Monosyllabic length</th>
<th>Cliticised Form</th>
<th>Non-cliticised Form</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Underlying</strong></td>
<td><strong>Phonetic</strong></td>
<td><strong>Phonetic</strong></td>
</tr>
<tr>
<td><strong>Representation</strong></td>
<td><strong>Representation</strong></td>
<td><strong>Representation</strong></td>
</tr>
<tr>
<td>ki-taa</td>
<td>kita: ki</td>
<td>kita</td>
</tr>
<tr>
<td>‘calabash’</td>
<td>‘which calabash’</td>
<td>‘calabash’</td>
</tr>
<tr>
<td>ki-loo</td>
<td>ki-lo: ki</td>
<td>ki-lo</td>
</tr>
<tr>
<td>‘night’</td>
<td>‘which might’</td>
<td>‘night’</td>
</tr>
<tr>
<td>ma-taa</td>
<td>ma-ta: ki</td>
<td>ma-ta</td>
</tr>
<tr>
<td>‘milk’</td>
<td>‘which milk’</td>
<td>‘milk’</td>
</tr>
</tbody>
</table>
Heavy And Light Syllables

- Recent phonological theories move to tackle this issue under syllable **WEIGHT**.
- Syllables are **heavy** when the rhyme is branched to contain:
  1. a long vowel or a diphthong, optionally followed by one or more consonants, as in *tea* or
  2. a short vowel followed at least by one consonant, as in *ten*.
- **Light** syllables are those with no branched rhymes containing a short vowel alone or a coda of no more than short consonant, as in *a* or *pa*.
- Light syllable are termed in phonological length as a **mora** whereas heavy syllables are being **greater than one mora**.
Syllable Weight

In numerous languages a factor that determines the applicability of certain phonological rules is the WEIGHT of the rhyme.

Essentially, a syllable is LIGHT if it contains a non branching rhyme as in [9. 31]. But a syllable is HEAVY if it contains a branching rhyme as in [9.32].

The onset seems never to play any role in the computation of syllable weight. Consequently, its internal structure is irrelevant.
Syllable Weight

Type A Languages

(a) In a light syllable the rhyme contains a short vowel as in [9.31]:

[9.31]

(b) In a heavy syllable the rhyme contains either
   (i) a long vowel or diphthong optionally followed by one or more consonants; or
   (ii) a short vowel followed by at least one consonant as in (9.32)

[9.32]
Syllable Weight

*Type B Languages*

(a) In a light syllable the rhyme contains a short vowel. As always, the presence or absence of a consonant in the onset is irrelevant. But in this case so is the presence of a consonant in the margin, following the nucleus:

[9.33]

\[
\begin{array}{c}
\sigma \\
O & N & p \\
R & M & a \\
\end{array}
\]

(b) In a heavy syllable the rhyme contains a long vowel or diphthong. The presence or absence of any consonant in the margin being again irrelevant.

[9.34]

\[
\begin{array}{c}
\sigma \\
O & N & p & a \\
R & M & a & t \\
\end{array}
\]
Abstract Segments

Consider the facts of French which are shown in [9.44] and [9.45]:

[9. 44][labe]  l(e) abbé  ‘the abbot’
   [lanc]       l(a) année  ‘the year’
   [leta]       l(e) état  ‘the state’
   [lidāntite]  l(a) identité  ‘the identity’

[9.45] Vowel truncation
[-cons] → ø/ _# V

[9. 46][lə bwa]  le bois  ‘the forest’
   [la karaf]   la carafe  ‘carafe, water-bottle’
   [lə pa]      le pas  ‘step, pace’
   [la maladi]  la maladie  ‘illness’
Abstract Segments

In the light of the solution provided above, how should words below commencing with the so-called 'H ASPIRE’ be represented in underlying lexical representations? Justify the rule which you propose.

[9.47] [le ara] *[lez ara] les haras ‘the stud farms’
[le arpist] *[lez arpist] les harpistes ‘the harpists’
[le er5] *[lez er5] les hérons ‘the herons’
[le erd] *[lez erd] les hordes ‘the hordes’
[le up] *[lez up] les houppes ‘the bunches’
Abstract Segments

In the case of h-aspire words, there is an unattached C which inhibits the application of the vowel truncation (deletion) rule although it is not linked to any concrete sound on the segmental tier. The situation can be represented in this way:
Extrasyllabicity

[9.49] (a) [pəti prɛs] petit prince ‘petty prince’
(b) [pəti tɑfɑ] petit enfant ‘little child’
Extrasyllabicity

Where the next word begins with a consonant as in petit prince [9. 50a], the floating underlying final /t/ of petit remains unattached at the end of the derivation and consequently fails to surface. But where the next word begins with a vowel as in petit enfant [9. 50b], a C-element is inserted at the CV-tier and the floating underlying /t/ is attached to it. The Onset First Principle (Maximal Onset Principle) ensures that the inserted C (and the segment it dominates) is attached as a syllable onset. The /t/ is then able to surface phonetically.
That's all Folks!

/ ði end əv lektʃə nain /