7.2. The structure of the syllable. Phonotactic constraints

Before we proceed, however, to a more detailed examination of the syllables of English we should first say a few more things about the structure of syllables in general. As I have already pointed out, there is no generally accepted definition of a syllable since the criteria we can use can be so different. Something that everybody will accept will be, however, that prominence plays an important part in identifying the number of syllables in an utterance. As we have seen, vowels are the most sonorous sounds human beings produce and when we are asked to count the syllables in a given word, phrase or sentence what we are actually counting is roughly the number of vocalic segments – simple or complex – that occur in that sequence of sounds. The presence of a vowel or of a sound having a high degree of sonority will then be an obligatory element in the configuration of what we call a syllable. I have mentioned other sonorous sounds beside the vowel because, as we are going to see, English syllables can arguably contain, as their most sonorous element, other sounds that vowels.

Since the vowel – or another highly sonorous sound – is at the core of the syllable, it is called the nucleus of that syllable. The sounds either preceding the vowel or coming after it are necessarily less sonorous than the vowels and unlike the nucleus they are optional elements in the make-up of the syllable. The basic configuration or template of an English syllable will be therefore (C)V(C) – the parentheses marking the optional character of the presence of the consonants in the respective positions. The part of the syllable preceding the nucleus is called the onset of the syllable. The non-vocalic elements coming after the nucleus are called the coda of the syllable. The nucleus and the coda together are often referred to as the rhyme of the syllable by analogy with the last part of a word that rhymes with the end of the word in the next line in a piece of poetry. It is, however, the nucleus, that is the essential part of the rhyme and of the whole syllable, as I have already pointed out. The preeminence of the nucleus over the other elements in the syllable has been likened to that of heads over the other elements in a syntactic structure. In a conventional tree-like representation of the structure of a syllable we will then have to show that the position of the nucleus is hierarchically more important than that of either the onset or the coda. Thus, the rhyme will be the first projection of the
nucleus, the node optionally dominating a coda, while the maximum projection will be the syllable itself, having an optional onset in sister position to the rhyme; the standard representation of a syllable in a tree-like diagram will look like that: (S stands for Syllable, O for Onset, R for Rhyme, N for Nucleus and Co for Coda).

\[
\text{S} \\
\text{O} \quad \text{R} \\
\text{N} \quad \text{Co}
\]

The structure of the syllable \textit{bel} in the word \textit{belfry} or the monosyllabic word \textit{bell} will look like that:

\[
\text{S} \\
\text{O} \quad \text{R} \\
\text{N} \quad \text{Co} \\
b \quad e \quad l
\]

A more complex syllable like \textbf{sprunt} will have this representation:

\[
\text{S} \\
\text{O} \quad \text{R} \\
\text{N} \quad \text{Co} \\
s \quad p \quad r \quad i \quad n \quad t
\]

All the syllables represented above are syllables containing all three elements (onset, nucleus, coda) of the type CVC. As I have pointed out earlier, we can very well have syllables in English that don’t have any coda; in other words, they end in the nucleus, that is the vocalic element of the syllable. A syllable that doesn’t have a coda and consequently ends in a vowel having the structure (C)V, is called an open syllable. One having a coda and therefore ending in a consonant - of the type (C)VC is called a closed syllable. The kind of syllable that is preponderant in a given language leaves its print on the acoustic features of the respective idiom. For instance, the higher degree of musicality of Romance languages – such as Italian, to give only one example – is largely due to the fact that, statistically, open syllables are more numerous in these languages than in Germanic languages, such as English or German itself, where the number of closed syllables is dominant.
The syllables analyzed above are all closed syllables. An open syllable will be for instance [meɪ] in either the monosyllabic word *may* or the polysyllabic *maiden*. Here is the tree diagram of the syllable:

```
S
  /
O R
  /
N m e i
```

English syllables can also have no onset and begin directly with the nucleus. Here is such a closed syllable: [ɔpt]

```
S
  /
R
  /
N Co
  /
ɛ p t
```

If such a syllable is open, it will only have a nucleus (the vowel), as [eə] in the monosyllabic noun *air* or the polysyllabic *aerial*.

```
S
  /
R
  /
N eə
```

In previous chapters dedicated to the description of the consonants and vowels of English, we have seen that quantity or duration is an important feature of consonants and especially vowels. A distinction was made between short and long vowels and this distinction is relevant for the discussion of syllables as well. A syllable that is open and ends in a *short vowel* will be called a *light* syllable. Its general description will be *CV*. If the syllable is still open, but the *vowel* in its nucleus is *long* or is a *diphthong*, it will be called a *heavy* syllable. Its representation is *CV*: (we remember that the colon is conventionally used to mark long vowels) or *CVV* (for a diphthong). Any closed syllable, no matter how many consonants will its coda include is called a heavy syllable, too. In other words, we will say that heavy syllables have *branching rhymes*. The feature that distinguishes the two kinds of syllable above is called *weight*:

a. open heavy syllable CVV
b. closed heavy syllable VCC
c. light syllable CV
Vowel quantity helps, as we have seen, distinguish open light syllables from open heavy syllables. We can conventionally consider the duration of a long vowel or of the diphthong to be twice as long as the duration of a short monophthong. Consequently, we can enrich our analysis of the syllable with a supplementary level that will not refer to the quality of the vowels (or even consonants; consonants are considered to have the duration of a short monophthong), but to their quantity. This is particularly helpful in understanding certain diachronic processes that altered the pronunciation of various English vowels, by either changing long vowels into diphthongs or turning diphthongs into long monophthongs. It is not the purpose of this book to give a detailed description of such diachronic transformations, but it will be useful to remember the conventional representation of this additional level, that we are going to call tier, that represents the quantity of the sounds in a syllable. As it is duration that it describes, the name usually employed for it is the timing tier, to distinguish it from the next and last tier, the one that actually gives the value of the respective sounds and which is called the melody tier. If we use the letter X to note the conventional duration of a time unit (a consonant or a short vowel), a diphthong, a long vowel or a geminate consonant will be represented by two XX. The skeletal time slots that we mark by X and are not included in the onset are also called moras. Here are some examples:

The syllable [pot] will be represented like that:
By contrast, [poːt] will be represented with a nucleus twice longer than the one before.

On the other hand, [mɛrn] will have a diphthong as a nucleus and will be represented as follows:

The representation of [tʃaːts] will look like that:

Notice that the two elements making up the affricate – the stop and the fricative – occupy a single time slot on the time tier and are represented separately on the melody tier, while each segment in a consonant cluster is allotted a different time unit.
Now that we have examined some of the basic syllable configurations, let us have a closer look at the phonotactics of English, in other words at the way in which the English language structures its syllables. We will remember from the very beginning that English is a language having a syllabic structure of the type (C)V(C). (This is exactly the structure of the Romanian syllable). This generalization captures the reality that in English as in Romanian both onsets and codas are optional elements and that we can have syllables like, say, fi-, i-, if- in English and ma-, a-, am- in Romanian. In other words, the maximum syllable template will be allowed in Romanian. This “freedom” is common to many languages in the world, but it is by no means a universal phonotactic feature. There are languages that will accept no coda, or, in other words, that will only have open syllables. Other languages will have codas, but the onset may be obligatory or not. Theoretically, there are nine possibilities:

1. The onset is obligatory and the coda is not accepted: the syllable will be of the type CV; this is actually the most common type of syllable in any language. It is the basic syllabic structure, the one people first acquire in infancy when they start to speak. That is why it is often called the core syllable. It is, however, the only possible pattern only in a small number of languages (Senufo in Africa and Hua in Papua New Guinea, (Roca: 1999: 247). Japanese, too, comes very close to this. With very few exceptions, Japanese will not accept two consonants coming in a row, so that in all loan words a vowel will be inserted to separate the members of a consonant cluster. Thus, English words like Christmas, grotesque and text will become kurisumasu, gurotesuku and tekisuto, respectively in Japanese. This vowel insertion is in accordance with the phonotactic constraints of Japanese.

2. The onset is obligatory and the coda is accepted. This is a syllable structure of the type CV(C) and is found in many languages (Arabic, for instance) as an obligatory syllable structure or template.

3. The onset is not obligatory, but no coda is accepted (the syllables are all open). The structure of the syllables in these languages (Maori in New Zealand or certain languages in South America) will consequently be (C)V.

4. The onset and the coda are neither obligatory nor prohibited, in other words they are both optional and the syllable template will be (C)V(C). As already pointed out, this is the type of language both English and Romanian belong to. We are left with five other exclusively theoretical possibilities, since no language actually conforms to either pattern.

5. There are no onsets in that language, in other words the syllable will always start with its vocalic nucleus: V(C)

6. The coda is obligatory, or, in other words, there are only closed syllables in that language: (C)VC.

7. All syllables in that language are maximal syllables – both the onset and the coda are obligatory: CVC
8. All syllables are minimal: both codas and onsets are prohibited, consequently, the language has no consonants: V.
9. All syllables are closed and the onset is excluded - the reverse of the core syllable: VC.