Week 4 – Syllables

September 20, 2012

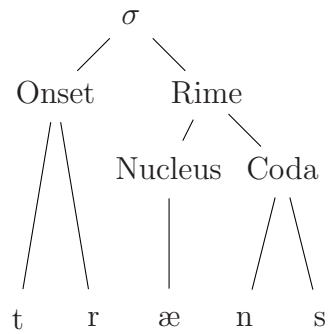
1 Syllables

1.1 What are syllables?

Syllables are phonological units that are hypothesized to

1. span multiple segments
2. have internal constituent structure
3. simplify the description of phonological processes and cross-linguistic facts.

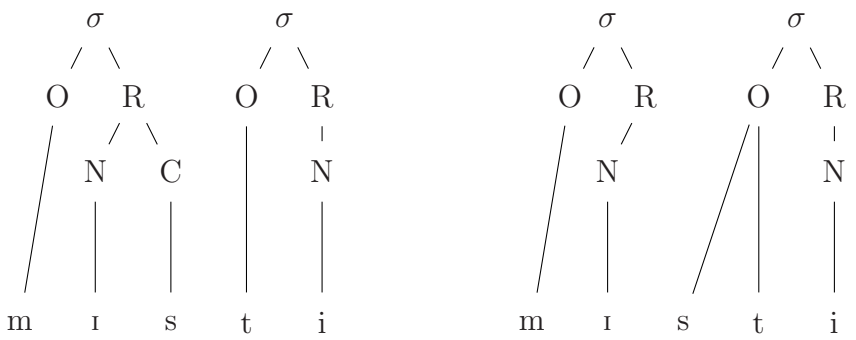
Here is an example of the syllable structure of the word *trance*.



Evidence for the Rime comes from

1. verse
2. asymmetries between codas and onsets in determining *syllable weight*. (This has to do with stress which we will discuss later.)

Can syllabification be constrastive in languages? If so, it would mean that there could be a language where [mɪs.ti] from [mɪ.sti] would be different words with different meanings.



To my knowledge there are no languages where syllabification is contrastive. On the other hand, many scholars maintain that syllabification is predictable (and therefore does not need to be included as information in the lexicon).

1.2 Sonority

The basis for syllables lies in the notion of *sonority*.

The following terms designate certain groups of similar sounds: vowels, glides, liquids, nasals, fricatives, affricates, and stops. In Hayes (2009), the following features are used to distinguish these classes.

vowels	glides	liquids	nasals	fricatives	affricates	stops
+syllabic	-syllabic					
-consonantal	+consonantal					
+approximant	-approximant					
+sonorant	-sonorant					
+continuant	-continuant					

These features can be defined in terms of sonority, an acoustic measure, which roughly corresponds to acoustic loudness.

1. Think of 'sonority' as 'singability'.
2. There is no clear single acoustic correllate of sonority.
3. Note that further distinctions can be made. I.e. lower vowels are said to be more sonorous than higher vowels.
4. These features can also be defined in terms of **stricture**, i.e. how much airflow is allowed to pass through the oral cavity. Different articulations constrict the flow of airs in different ways contributing to different degrees of sonority.

The **Sonority Sequencing Principle** says that, within onsets, sounds *increase* in sonority from left to right and that, within codas, sounds *decrease* in sonority from left to right. In other words, as sounds get closer to the nucleus, sonority increases.

★ What is the obvious exception to this in English?

1.3 Syllabification

To a first approximation, syllables can be identified by a very simple procedure.

1. Scanning from left to right identify the vowels in the word, and project a syllable node from them. These vowels are **syllable nuclei**.
2. For each syllable node, link to a consonant to the left of the vowel (if there is one). This consonant is (part of) the **onset**.
3. Then, for each syllable node, link to a consonant to the right of the vowel (if there is one). This consonant is (part of) the **coda**.
4. Unlinked segments are then either linked to existing syllable nodes, respecting the Sonority Sequencing Principle wherever possible.
5. Repeat from the beginning with the next sonorous sounds (such as glides or liquids) now serving to project syllable nuclei.

★ Let's apply the algorithm to [nostradamʌs]

When words have onsets, codas or nuclei that span more than one segment, they are said to be **complex**. Sometimes these are also called **branching**.

1.4 Allowing rules to refer to syllables simplifies rules

Consider the generalization that could be made for Sierra Popoluca (Kenstowicz and Kisseberth, 1979, p. 42) that nongeminate stops aspirate in coda position.

/petkuy/	→	[pet^{h}kuy]	'broom'
/petta:p/	→	[petta:p^{h}]	'it is being swept'
/mok/	→	[mok^{h}]	'corn'

In this anaysis, I will assume that geminates are a single consonant distinguished with the feature [long].

Without reference to syllables we would write

$$\begin{bmatrix} -continuant \\ -delayedrelease \end{bmatrix} \longrightarrow \text{[+spread glottis] / } \underline{\quad} \text{ \{C, \#\}}$$

With syllables we can write:

$$\begin{bmatrix} -continuant \\ -delayedrelease \end{bmatrix}] \longrightarrow \text{[+spread glottis] / } \underline{\quad}]_\sigma$$

The notion of syllables unifies the environments ____ C and ____ #.

★ In order for this rule to make sense, when does syllabification have to occur?

★ What assumption did I not make explicit about how geminates are syllabified that explains why I can exclude the feature [−long] in the target of the rules?

★ What kind of evidence could be brought to bear upon whether this assumption is warranted or not?

1.5 Cross-linguistic facts

These typological facts come from Blevins (1995) and exclude complex onsets and codas.

Languages	onsets	codas	possible syllables
Arabela, Siona, Piro, Hua	required	forbidden	CV
Totonac, Klamath, Nisqually, Tunica, Sedang, Dakota, Thargari	required	allowed, but not required	CV, CVC
Pirahã, Mazateco, Fijian, Cayuvava	allowed, but not required	forbidden	V, CV
English, Gilyak, Finnish, Tamazight Berber, Cairene Arabic, Spanish, Italian, Mokilese, Cuna	allowed, but not required	allowed, but not required	V, CV, VC, CVC

These typological facts suggest that

1. Onsets are preferred because they may be required, and are never forbidden.

2. Codas are dispreferred because they are never required, and may be forbidden.

and raises the following questions:

1. Why are onsets preferred cross-linguistically?

2. Why are codas dispreferred cross-linguistically?

3. What does it mean for something to be (dis)preferred cross-linguistically?

When typological gaps are observed (i.e. a logically possible language type is unattested), either this is accidental or there is a principled explanation for the gap.

1.6 OT analysis of the above cross-linguistic generalizations

In Optimality Theory, faithfulness constraints that regulate against deletion have been proposed.

- 1. Generalization: Every speech sound in the underlying form should appear in the surface form.
  2. Violation Assignment: Assign a violation for each segment in the underlying form that is not present in the surface form.
  3. Notation: Max

This constraint is called Max in the OT literature. (McCarthy, 2008, p. 24) explains that this is because "it requires the inputs segments to be maximally expressed in the output."

In Optimality Theory, faithfulness constraints that regulate against epenthesis have been proposed.

- 1. Generalization: Every speech sound in the surface form should occur in the underlying form.
  2. Violation Assignment: Assign a violation for each segment in the surface form that is not present in the underlying form.
  3. Notation: Dep

This constraint is called Dep in the OT literature. (McCarthy, 2008, p. 13) explains that this is because "it requires the output to DEPend on the input as the source of all its segments."[1]

In Optimality Theory, markedness constraints Onset and NoCoda have been proposed which penalize surface forms *without onsets*, and *with codas*, respectively.

- 1. Generalization: Syllables have onsets.

[1]It may be easier to think of Dep as an abbreviation for "Don't EPenthesize."

2. Violation Assignment: Assign a violation for each onsetless syllable.
3. Notation: Onset

- 1. Generalization: Syllables do not have codas.
  2. Violation Assignment: Assign a violation for each syllable with a coda.
  3. Notation: NoCoda

★ Let's see how these constraints help derive the simple typology mentioned above.

References

Blevins, Juliette. 1995. Syllable in phonological theory. In *The Handbook of Phonological Theory*, edited by John Goldsmith, 206–244. Blackwell Publishers.

Hayes, Bruce. 2009. *Introductory Phonology*. Wiley-Blackwell.

Kenstowicz, Michael, and Charles Kisseberth. 1979. *Generative Phonology*. Academic Press, Inc.

McCarthy, John. 2008. *Doing Optimality Theory*. Malden, MA: Blackwell.