The syllable
Early generative phonology didn't recognize the syllable as a relevant unit.
• Early generative phonology didn't recognize the syllable as a relevant unit
• But, some processes refer to the syllable
• Nasal assimilation in Spanish

  – Assimilation occurs

  • [um beso] a kiss
  • [uŋ gato] a cat
  • [uŋ tʃarko] a puddle
  • [uŋ weβo] an egg
Nasal assimilation in Spanish

- Assimilation occurs
  - [um beso] a kiss
  - [uŋ gato] a cat
  - [uŋ tʃarko] a puddle
  - [uŋ weβo] an egg

- Assimilation doesn't occur
  - [mweβo] not *[ŋweβo] I move
  - [ŋweβo] not *[ŋweβo] new
• Nasal assimilation in Spanish
  – Maybe assimilation only occurs word-finally
  • [uŋ gato] a cat
  • [uŋ tfarko] a puddle
• Nasal assimilation in Spanish
  – Maybe assimilation only occurs word-finally
    • [uŋ gato] a cat
    • [uŋ ʧarko] a puddle
  – Actually it occurs word-internally too
    • [uŋgaro] Hungarian
    • [aŋʃo] wide
Nasal assimilation in Spanish

- But if it occurs between words and within words, why doesn't it apply within words to:
  - \([\text{mwe}βo]\) not \([\text{ŋwe}βo]\) I move
  - \([\text{nwe}βo]\) not \([\text{ŋwe}βo]\) new
Nasal assimilation in Spanish

- But if it occurs between words and within words, why doesn't it apply within words to:
  - \[mweβo\] not *[ŋweβo]* I move
  - \[nweβo\] not *[ŋweβo]* new
- To explain this we need to look at syllabification
• Nasal assimilation in Spanish
  – Nasals in syllable final position assimilate
    • [uŋ.ga.to] a cat
    • [uŋ.we.βo] an egg
    • [uŋ.ga.ro] Hungarian
    • [aŋ.tʃo] wide
Nasal assimilation in Spanish

- Nasals in syllable final position assimilate
  - [uŋ.ga.to] a cat
  - [uŋ.we.βo] an egg
  - [uŋ.ga.ro] Hungarian
  - [aŋ.tʃo] wide
- Nasals in syllable initial position don't assimilate
  - [mwe.βo] not *[ŋwe.βo] I move
  - [nwe.βo] not *[ŋwe.βo] new
Nasal assimilation in Spanish

- Nasals in syllable final position assimilate
  - [uŋ.ga.to] a cat
  - [uŋ.we.βo] an egg
  - [uŋ.ga.ro] Hungarian
  - [aŋ.tf] wide
- Nasals in syllable initial position don't assimilate
  - [mwe.βo] not *[ŋwe.βo] I move
  - [nwe.βo] not *[ŋwe.βo] new
- You can't explain this without invoking syllables
• /s/ voicing in Spanish
  - /s/ > [z] before voiced non-vowels
    • /bejβol/ > [beizβol] (within a word)
    • /loβes/ > [loz weβos] (across words)
    • /loβes/ > [loz jates] (across words)
• /s/ voicing in Spanish
  – /s/ > [z] before voiced non-vowels
    • /bejsβol/ > [beizβol] (within a word)
    • /los ueβos/ > [loz weβos] (across words)
    • /los jates/ > [loz jates] (across words)
  – But it doesn't apply within some words
    • /ðe.sjer.to/ > *[ðe.zjer.to] (within a word)
• /s/ voicing in Spanish
  – So what's the difference? Syllabification
  – /s/ > /z/ across syllables not within a syllable
  • /bejs.βol/ > [beiz.βol] (within a word)
  • /los.ue.βos/ > [loz.we.βos] (across words)
  • /los.ja.tes/ > [loz.ja.tes] (across words)
  • /ðe.sjer.to/ > *[ðe.zjer.to] (within a word)
  • /ðes.ðe/ > [ðez.ðe] (within a word)
• /s/ voicing in Spanish
  
  – Aren't linguists just putting syllable boundaries in places to make this work?
  – No, Spanish speakers will syllabify the words this way
    • Desde os des.de
    • Desierto is de.sierto
• Internal syllable structure
  – Most language have this structure
• Internal syllable structure
  – Most language have this structure
  – Some have this structure (Korean)
• Evidence for the rime

  - **Breakfast** + **lunch** = brunch (rimes are in red)
    • Rimes are kept intact
  - **Breakfast** + **lunch** = *breach (rimes are in red)
    • Rimes are broken up ea-k and un-ch
  - **Sm[ow]ke** + **f[α]g** = sm[α]g
    • Rimes are kept intact
  - **Sm[ow]ke** + **f[α]g** = *sm[ow]g (rimes are in red)
    • Rimes are broken up: [ow]-ke and [α]-g
Sonority and Syllables

• Syllables are generally organized around a phonological property called **sonority**.
  - basically: sonority = perceived loudness

• Sonorants (vowels, liquids, nasals, glides) have lots of sonority;
  - obstruents (stops and fricatives) have less.

• Basic idea: the most sonorous segments in a syllable form the “peak” or **nucleus** of the syllable.
  - vowels make good peaks;
  - sonorant consonants are second-best;
  - obstruents are really bad…
For Example

- [bæd] is a well-formed syllable in English.

    [æ]  \[\text{high sonority}\]

    [b] \[\text{low sonority}\]

    [d]
Sonority and Syllables

- [blænd] works well, too.

[æ]

[ɪ] [n]

[b] [d]

high sonority

low sonority
Technical Terms

- [æ] (sonority peak)
- [l] (low sonority)
- [n] (high sonority)
- [b]
- [d]

- [æ] (sonority peak)
Technical Terms

• The sonority peak forms the **nucleus** of the syllable.
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• The sounds that precede the nucleus form the syllable **onset**.
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• The sounds that follow the nucleus form the syllable **coda**.
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• The sonority peak forms the **nucleus** of the syllable.
• The sounds that precede the nucleus form the syllable **onset**.
• The sounds that follow the nucleus form the syllable **coda**.
• Together, the nucleus and coda form the syllable **rhyme**.
Syllable Formation

• In order to figure out how to organize a word into syllables, first identify the syllable nuclei
  • = vowels and any syllabic consonants
• Example: “America”

• Then identify any potential onsets to each syllable
  • = consonants preceding the nuclei
Phonotactics

- **Phonotactic constraints** determine what sounds can be put together to form the different parts of a syllable in a language.

- Ex: English onsets
  
  /kl/ is okay: “clean” “clamp”
  /pl/ is okay: “play” “plaque”
  */tl/ is not okay: *tlay *tlamp

- If we ever encounter a word that starts with /tl/, we have to do something about it.

- How do you say “Tlingit”?

- Or “Dmitri”?
Let’s Try Another…

Note 1: both halves of a diphthong combine into one nucleus

Note 2: [rk] is not a possible onset!

⇒ The [r] has to form the coda of the preceding syllable

So, Step 3 = remaining consonants go into codas.
The Possibilities are not Endless

• Q: What combination of consonants can form a possible onset?

• A: Any combo that can be found at the beginning of a word.

• [θr] can start a word (“three”), so “arthritic” is syllabified like this:

```
σ
   /\N
  /   \C
 /     /
[a]    [r]
θθ     r
   /\I
  /   /
 t    ik
```

```
σ
 σ
O
 /\N
 /   /
 t    ik
```

```
σ
 σ
O
 /\N
 /   /
 O    C
```
The Possibilities are not Endless

• [tl] and [nt] cannot start words (in English), so they cannot form legal syllable onsets.

• Check out the syllabification for “Atlantic”:

\[
\begin{align*}
N & \quad C \\
æ & \quad t \\
O & \quad N & \quad C \\
I & \quad æ & \quad n \\
O & \quad N & \quad C \\
t & \quad i & \quad k
\end{align*}
\]
Interesting Patterns

• Check out the following words:
  Atlantic  atrocious
  America  arcade
  astronomy  arthritic

• When is the first vowel a [ʌ]?
• Is there a difference between the /t/ in ‘atrocious’ and the /t/ in ‘Atlantic’?
• Why?