Today's objectives:

- **Diagnosing syllables**
- **Representing syllable structure**

Background preparation:

- *Cairene Arabic*

0. Today's plan

- Review: What justifies adding syllables to our phonological model?
- Pharyngealization spread in Cairene Arabic
  - How to analyze it
  - Implications for syllable structure options between languages
- Epenthesis in Cairene Arabic
  - How to analyze it
- Syllable structure in our model (part 1)

1. Review and context

Check-in discussion

- Why is English voiceless-stop aspiration a good argument in favor of the **phonological relevance** of syllable structure?
  - That is: Why does it support the **inclusion** of syllable structure in our **model** of the phonological grammar?

1. Review and context

Check-in discussion

- Why is English voiceless-stop aspiration a good argument in favor of the **phonological relevance** of syllable structure?
  - That is: Why does it support the **inclusion** of syllable structure in our **model** of the phonological grammar?

  → Without syllables, our model is **unable** to characterize the environments where aspiration does or does not occur in a unified way

1. Review and context

- Our English aspiration analysis illustrates general **strategies** for syllable-structure-based analysis:
  1. *Make an initial hypothesis:* Use "straightforward" examples to get insight into how syllable structure determines a phonological pattern
  2. *Consider syllable-structure implications:* What proposal does our initial hypothesis lead us to make about syllable divisions inside words?
  3. *Look for converging evidence:* Can we show that multiple phonological patterns lead us to propose the same syllable structure?

2. Pharyngealization spread in Cairene Arabic

Group discussion | Data set: Cairene Arabic (part I)

- Potential hypotheses about how "emphasis" (pharyngealization) spreads — Are they supported?
  1. It spreads to every segment in the word
  2. It spreads to exactly one segment and stops
  3. It spreads only from right to left
  4. It spreads only from left to right
  5. A vowel that gets pharyngealized always propagates pharyngealization onward to its next neighboring consonant

2. Pharyngealization spread in Cairene Arabic

Debriefing | Data set: Cairene Arabic (part I)

- **All** of these hypotheses have **counterexamples**
  - 1,2 Pharyngealization *can* spread more than once, but *doesn't always*
  - 3,4 It spreads to the *left* in some words, to the *right* in others, and sometimes even *both ways*
  - 5 It *can* spread from a vowel onto the next consonant, but *doesn't always*

- Can we propose a **more successful hypothesis** for pharyngealization spread in this data set?

2. Pharyngealization spread in Cairene Arabic

Group discussion | Data set: Cairene Arabic (part I)

- Hypothesis: "Pharyngealization spreads to all segments in the same syllable"
  - Which words show this pattern **unambiguously**? (Which words need only "safe assumptions"?)
  - Which examples force us to make **proposals** about how syllables are structured, if our hypothesis is correct?
  - Are those proposals **plausible** and **consistent**? (What generalizations can we draw about possible syllable structures in Cairene Arabic?)

3. Syllable structure in Cairene Arabic

Data set: Cairene Arabic (part I)

- Is anything about Cairene syllable structure different from what happens in English?

3. Syllable structure in Cairene Arabic

Data set: Cairene Arabic (part I)

- Is anything about Cairene syllable structure different from what happens in English?
  - What happens when there are **two consonants** between vowels…
    - in Cairene? [**R A**ː g i l] vs. [**R A G** l eː n]
    - in English? [kʰ ə **m pʰ** ɛ ɹ] vs. [ə **s p** aj ɹ]
  - What is the **maximum** number of consonants we seem to see in syllable-initial and syllable-final position in Cairene?

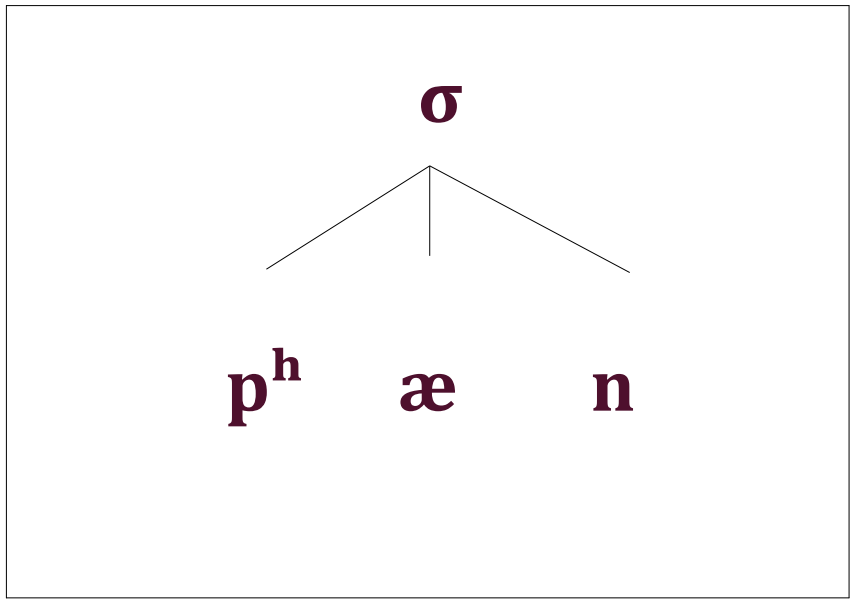
3. Syllable structure in Cairene Arabic

Group discussion | Data set: Cairene Arabic (part II)

- Now look at the epenthesis (insertion) data in Part II
  - How can we use the epenthesis facts as **converging evidence** for our approach to the pattern of pharyngealization spread?

4. Representing syllable structure

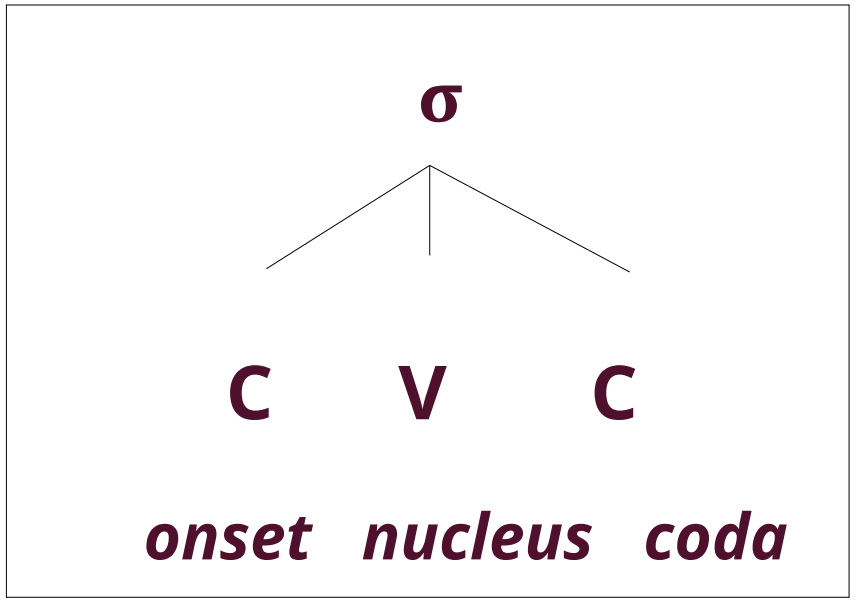
- We can represent a **syllable** as a phonological structure that segments belong to



  - This diagram can be called a **syllable tree** (similar to tree structures in syntax)

4. Representing syllable structure

- A syllable and its subparts



σ syllable

V abbreviates "[**+**syll]"

C abbreviates "[**–**syll]"

- **Nucleus**: The core or main part of the σ; every syllable has a nucleus by definition; always **[+syll]**
- **Onset**: All segments in the σ that precede the nucleus
- **Coda**: All segments in the σ that follow the nucleus
- Onset and coda are always **[–syll]** (by definition)

4. Representing syllable structure

Group discussion

- Using this notation, draw the syllable structure that we have proposed for these words:
  - English [kʰ ə m pʰ ɛ ɹ]
    [ə s p aj ɹ]
  - Cairene Arabic [R Aː g i l]
    [R A G l eː n]

5. Syllables and mental grammar, part 1

- Our model of the phonological mental grammar currently includes…
  - A set of **features**
  - The concept of a **segment**, made up of features
  - Word boundary (#)
  - Phonological rules that manipulate features (called "**segmental rules**"): A → B / C __ D
  - The concept of a **syllable (σ)**, made up of segments
  - The syllable positions **nucleus**, **onset**, **coda**

5. Syllables and mental grammar, part 1

- Our model can now **represent** the syllable structure of words in a given language
  - Once we have a proposal for how segments are **associated** to syllables, our model can **describe** this structure using **syllable tree** notation

- But our model also needs a way to **describe**, **predict**, and **explain** how segments are **assigned** to syllables in a given language
  - We will pursue this idea next time