Objectives:

- **Model allophone distribution in OT**

- **Strengthen the OT grammar with 'Richness of the Base'**

Background preparation:

- *Data set: Greek*

0. Today's plan

- OT check-in

- The Greek allophone distribution problem, part 1 — how do we understand the phonological factors involved in this pattern?

- Predictable information in OT [+ Canvas activity c04.18]

- Richness of the Base

- Looking ahead: allophone distribution in OT, part 2 (next class)

- In OT, when we want to **determine the grammar of one language** (from a data set), what do we do?
  - We observe some _____
  - We look at phonological evidence from the data set to propose their ____, in the usual way
  - We use tableaus to find the _____

  Try to answer these before you go to the next slide!

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- In OT, when we want to **test the predictions of a certain constraint ranking**, what do we do?

    - We start by knowing or assuming a **ranking**

    - We pick some relevant _____ to work with

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2. Allophone distribution in OT (part 1)

- When we propose a grammar for a given language, **what kinds of things should this grammar be able to do**?

  Think about this for a moment before you go to the next slide!

2. Allophone distribution in OT (part 1)

- When we propose a grammar for a given language, **what kinds of things should this grammar be able to do**?

    - Account for the phonological patterns of a native speaker of the language!

    - **Enforce predictable patterns**:

        - Syllable structure (← our focus in OT so far)

        - Segment distribution patterns

        - Morpheme alternations

2. Allophone distribution in OT (part 1)

Data set: [Greek](#) | [k], [x], [c], [ç]

- What are the facts in this data set?

    - In what **environments** do these sounds occur?
    - Which sounds are in **contrastive** (unpredictable) vs. **complementary** (predictable) distribution?
    - What are the **"elsewhere"/default allophones**?

- Note: This pattern is <u>not</u> about syllable structure

    → *These questions build on today's prep questions*

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    - Contrastive: [k] vs. [x]; [c] vs. [ç]
    - Complementary: [k] and [c]; [x] and [ç]
    Generalization:

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- Which sounds are in **contrastive** (unpredictable) vs. **complementary** (predictable) distribution?

  Generalization:

  - Velars and palatals are in complementary dist.
  - Dorsal stops and dorsal fricatives are contrastive

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- What are the **"elsewhere"/default allophones**?
    - The velars [k], [x] have no natural-class environment

- If we were doing rule-based phonology, what rule would we write for this pattern?

Data set: <u>Greek</u> | [k], [x], [c], [ç]

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- If we were doing rule-based phonology, what rule would we write for this pattern?

  - Remember that palatals are [COR, DORS]

$$\begin{bmatrix} \text{DORS} \\ \text{–son} \end{bmatrix} \rightarrow [\ \text{COR}\ ] / \_\_ [\text{–bk}]$$

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Data set: [Greek](#) | [k], [x], [c], [ç]

- Now that we know what the phonological patterns are, we can start thinking about them in terms of constraints

- Before we return to this topic, we need to discuss another key idea: how to make OT grammar **enforce predictable information**

3. Predictable information in OT

~~Group~~ **discussion** *[use Canvas activity c04.18]*

- Exercise: <u>A CVCV language</u>
    - Use Canvas "participation activity" c04.18 to answer the questions in this section of the slides

3. Predictable information in OT

~~**Group**~~ **discussion** *[use Canvas activity c04.18]*

- OT warm-up questions
  - Answer the first three questions in Canvas

~~Group~~ discussion *[use Canvas activity c04.18]*

- Exercise: <u>A CVCV language</u>

  - Consider the word [patoma] in the data set

  - Answer these questions in Canvas:

    - What is the **gloss** (English translation) for this word?

    - There are no morpheme alternations in this language. What is the **UR** of this word?

~~Group~~ **discussion** *[use Canvas activity c04.18]*

- Exercise: <u>A CVCV language</u>

    - Consider the word [patoma] in the data set

    - Answer this question in Canvas:

        - Which of the given constraints does the output [patoma] **violate**, given the UR (input) you have proposed?
        Choose all that apply.

~~Group~~ discussion *[use Canvas activity c04.18]*

- Exercise: <u>A CVCV language</u>

  - Consider the word [patoma] in the data set

  - Answer this questions in Canvas:

    - Choose any two of the given constraints. Can you propose an **informative loser** (for the output [patoma]) that helps us prove a constraint ranking? If yes, give that loser and state the ranking proven. If no, explain why this is not possible.

Debriefing | Exercise: <u>A CVCV language</u>

- Suppose a language only has morphemes with the shape /CV/, /CVCV/, /CVCVCV/, etc.

  - Can we rank Onset and NoCoda with respect to NoEpenthesis and NoDeletion?

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    - Not with morphemes from the lexicon as inputs! There will **never** be any constraint conflict to provide a ranking argument, because the winners are all **perfect** on these constraints

3. Predictable information in OT

Debriefing | Exercise: [A CVCV language](#)

- Suppose a language only has morphemes with the shape /CV/, /CVCV/, /CVCVCV/, etc.

  - Can we rank O~NSET~ and N~O~C~ODA~ with respect to N~O~E~PENTHESIS~ and N~O~D~ELETION~?

  - Not with morphemes from the lexicon as inputs!

- BUT: What do you think will happen if this language **borrows** a word with the shape /CVC/? How do you think the loanword will surface?

3. Predictable information in OT

- BUT: What do you think will happen if this language **borrows** a word with the shape /CVC/? How do you think the loanword will surface?

    - Most languages that never have codas also **avoid** codas when they **borrow** words (at least at first—prolonged borrowing can change this pattern)

    - Hawai'ian is one example:

    English *wine* [wai<u>n</u>] → [wai.n<u>a</u>]

3. Predictable information in OT

- BUT: What do you think will happen if this language **borrows** a word with the shape /CVC/? How do you think the loanword will surface?

  - If the language **adds vowels to avoid codas** in borrowed words, what *should* we conclude about NoEpenthesis, NoDeletion, and NoCoda?

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/CVC/	NoEpen	NoDel	NoCoda
→ (a) [CV.C**V**]			
(b) [CV_]			
(c) [CVC]			

*Try assigning * and w/L before going to the next slide*

3. Predictable information in OT

- If the language **adds vowels to avoid codas** in borrowed words, what *should* we conclude about NoEpenthesis, NoDeletion, and NoCoda?

/CVC/	NoEpen	NoDel	NoCoda
→ (a) [CV.C**V**]	*		
(b) [CV_]	L	* W	
(c) [CVC]	L		* W

- { NoCoda, NoDeletion } » NoEpenthesis

3. Predictable information in OT

- How can we reconcile these two facts?

  If a language only has morphemes with the shape /CV/, /CVCV/, /CVCVCV/, etc. …

  - There is **no way to prove any rankings** among (for example) NoCoda, NoEpenthesis, and NoDeletion using existing morphemes of the language
  - And yet, native speakers of such a language typically **will not allow** (for example) **codas** in loanwords

3. Predictable information in OT

- More generally: What do we have to do to make an OT grammar **predict** that something is **ungrammatical** in a language, when it simply **never arises** (so no tableau for any morpheme of the language will ever lead to constraint conflict)?

- Quick OT concept check:

  Markedness or **faithfulness**?
  - Which type of constraint (if ranked high enough) can **enforce predictable patterns** in a language by requiring surface forms to have particular properties?
  - Which type of constraint (if ranked high enough) can ensure that **unpredictable information** stored in URs will survive (=be **contrastive**) in surface forms in a language?

  Try to answer before going to the next slide!

4. The OT principle of "Richness of the Base"

- Quick OT concept check:

  Markedness or **faithfulness**?
  - Which type of constraint (if ranked high enough) can **enforce predictable patterns** in a language by requiring surface forms to have particular properties? | **markedness constraints**
  - Which type of constraint (if ranked high enough) can ensure that **unpredictable information** stored in URs will survive (=be **contrastive**) in surface forms in a language? | **faithfulness constraints**

4. The OT principle of "Richness of the Base"

- If we are serious about the idea that **predictable** patterns are driven by **markedness** constraints, we <u>must conclude</u> that NoCoda » *Faithfulness* in our <u>CVCV language</u> exercise

  - NoCoda must dominate either NoDel or NoEpenth, although **we don't know which one** (if we don't know about loanwords)

  - Why don't we know? Existing words in a CVCV language never show epenthesis or deletion

4. The OT principle of "Richness of the Base"

- If we are serious about the idea that **predictable** patterns are driven by **markedness** constraints, we must conclude that NoCoda » *Faithfulness* in our CVCV language exercise

- If we have NoCoda » *Faithfulness*, we have a grammar with the **power** to get rid of codas

    - Even if we give the grammar an input with a final consonant, the output will still have no coda

4. The OT principle of "Richness of the Base"

- But...how can we give the grammar an input with a final consonant, if there is no evidence that any morpheme ends in a consonant?

  - Here is where *input and UR are not the same*

  - We can give the grammar a **hypothetical** input (not a real word) and consider *what it would do*

  - In a way, this is like "giving the grammar a loanword"

- Handout - Predictable information in OT and 'Richness of the Base'

4. The OT principle of "Richness of the Base"

- What this means:

  A grammar with N<small>O</small>C<small>ODA</small> » *Faithfulness* will **productively** get rid of codas, even if no existing morphemes show this alternation

4. The OT principle of "Richness of the Base"

- This example illustrates a key OT principle:
    - **Richness of the Base** (ROTB): There are no language-particular restrictions on input forms (Prince & Smolensky 1993)
    - We can't "explain" why there are no codas simply by saying that no inputs have final consonants
    - Instead, we have to **make the grammar robust enough** to cause candidates with codas to lose

- Next time:
  - We will return to the Greek allophones problem and combine our **description** of the allophone distribution with this new idea of **Richness of the Base** to develop an approach to **complementary distribution** in OT

  - Then we will apply the concept of **factorial typology** (from last class) to see what other language patterns our allophone analysis predicts should exist!