Today's topics:

- **Review: Phonemes, allophones, environments**
- **Applying phonological rules**

Background preparation:

- *Previous material on features, processes, rules*

0. Today's objectives

After today's class, you should be able to:

- Remember Ling 101-level analysis of allophones of phonemes

- Apply our **feature model** and **rule notation** to analyzing allophones of phonemes

- Apply our **principles for choosing a morpheme UR** to the case of allophones of phonemes

Note: Allophones and allophone rules are **not** included on the midterm (but we'll use these concepts later in the course, and they are on the final) — focus today on **model review**!

- Building a model allows us to **describe / predict / explain** facts about the world

- We **define** the **entities** in a model, and define their **behaviors** and **interactions** — this allows us to see what the model **predicts**
  - Then we can **test** these predictions on new data

- When we work with a model, we must use it according to how it is defined (build the apple with the Legos)
  - Otherwise, we *aren't actually testing* the model

- Example: SC HW #2 – Koromfé

  - How do we divide the words into morphemes?

  - **According to our model** of mental grammar, how does a speaker generate a plural noun?

2. Phonemes and allophones: Try it

Group discussion (LING 101 review)

- Data set: [Tohono O'odham](#)

  Consider the sounds [ʈ ɖ t͡ʃ d͡ʒ]

  - How many phonemes are there?
  - Which of these sounds are allophones of the same phoneme?

- No outside resources! 🙂

  - Pool your group's knowledge to see what you can remember about how to do this

Debriefing

- Data set: <u>Tohono O'odham</u> | [t̪ d̪ t͡ʃ d͡ʒ]

  Some key concepts
  - **environment**
  - predictable or unpredictable
  - in contrast
  - complementary distribution
  - how to **group** allophones

- How can we use the highlighted points to **test** the **predictions** of our feature model?

- Some review from LING 101:
  - What is a **phoneme**?
  - What is an **allophone**?

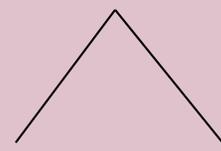- Some plausible made-up examples for illustration:

???	/m/	/d/
???	[m]	[d] [ɾ]

- Some review from LING 101:

  - What is a **phoneme**? — mental sound category
  - What is an **allophone**? — surface or "phonetic" pronunciation of a sound

- Some plausible made-up examples for illustration:

Phonemes   /m/   /d/

Allophones   [m]   [d]   [ɾ]

3. Segment distribution — is it predictable?

- Key question: Is the distribution of two sounds **predictable** or **unpredictable**?

  - How can we figure this out?
  - How does this help us test our feature model?

3. Segment distribution — is it predictable?

- Key question: Is the distribution of two sounds **predictable** or **unpredictable**?
  - How can we figure this out?
    - Is the choice between the two sounds something we can **predict** based entirely on the **environment** where they occur?
  - How does this test our feature model?
    - Does the model let us **describe** the crucial environment?
  - Try it for <u>Tohono O'odham</u> | [ʈ ɖ t͡ʃ d͡ʒ]

3. Segment distribution — is it predictable?

- Terminology (not on midterm!)
    - **Contrastive** distribution

    - **Complementary** distribution

- How do these terms match up with...
    - phoneme vs. allophone?
    - predictable vs. unpredictable distribution?

3. Segment distribution — is it predictable?

- Terminology
  - **Contrastive** distribution
    - Sounds are in *contrast*; (near-)minimal pairs
  - **Complementary** distribution
    - Environments are *complements* (as in sets)

- How do these terms match up with...
  - phoneme vs. allophone?
  - predictable vs. unpredictable distribution?

- For more review of these key LING 101 concepts, see handout "Determining the distribution of segments in a language"

3. Segment distribution — is it predictable?

- Key question: Is the distribution of two sounds **predictable** or **unpredictable**?
  - Why does this matter?

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  - Why does this matter?

- Should our **model** of the phonology of a language propose that a **predictable** pattern is...

  - stored in the mental lexicon?
  - produced by the phonological grammar?

  Why? (And how could we **test** this prediction?)

4. Modeling segment distribution

- When the distribution of two sounds [X] and [Y] in a language is **predictable** (and productive) …

  …we propose that the **grammar** determines whether [X] or [Y] appears in any given surface form

  - [X] and [Y] differ phonetically and featurally
  - But they belong to the **same phoneme** (mental/cognitive sound category)

Phoneme   /(?)/   (← What is the **best** UR proposal?)

Allophones   [X]   [Y]

4. Modeling segment distribution

- **How** does the grammar enforce the predictable distribution of allophones?

    - We need a means for the grammar to make adjustments to a phoneme's surface form depending on the environment

    - Can our model handle this?

4. Modeling segment distribution

- What is the connection, in our **model** of phonological grammars, between:
    - phonemes with multiple allophones
    - morphemes that alternate

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- In both cases, some **phonological process** in the grammar is changing certain sound representations in certain environments
  - How do we model a phonological process?

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- In both cases, some **phonological process** in the grammar is changing certain sound representations in certain environments
  - How do we model a phonological process?
    - With a **phonological rule**

4. Modeling segment distribution

- Once we have identified a phoneme with multiple allophones, how do we write a phonological rule?

- Similar principles for morpheme alternations!
  - **Compare hypotheses** for the **UR** (phoneme label)
  - Does either option make better **predictions**?
  - Does either option get expressed more **insightfully** in the model?
  - The environment of one allophone is sometimes best described as '**elsewhere**', if it can't be stated as a single segment class

4. Modeling segment distribution

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  - Try it for <u>Tohono O'odham</u> | [ʈ ɖ t͡ʃ d͡ʒ]

- Propose (a) rule(s) for this phenomenon
  - What is the best UR choice, and why?
  - What rule(s) do we propose in our final analysis?
  - How do we pair up the allophones, and why?

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- Which **pairs** of allophones are grouped into phonemes, and why?

  - Which hypothesis is **more insightfully expressed** in our **model**?

  - Does this choice seem plausible or insighful to you? (Why?)

General discussion

- Given a data set showing either

  - allophones in predictable distribution

  - morpheme alternations

Which is *stronger* evidence for the existence of a phonological process in the grammar? Why?

General discussion

- Can a single data set show both predictable distribution and alternating morphemes?

  - What do we expect, if a phonological process is maximally general?

  - Try it for Lamba | [ʃ s]

5. Allophones and alternating morphemes

- Can a single data set show both predictable distribution and alternating morphemes?

    - What do we expect, if a phonological process is maximally general?

- If a rule in the phonological grammar refers *only* to phonological environments (not morphemes)...

    - we predict sounds in predictable / complementary / allophonic **distribution**
    - we predict morpheme **alternations** when word-building creates the relevant environment

6. For next time

- **Midterm exam** is on **W Feb 25**

- Resources are available for you to review! — see Daily Syllabus page
    - Exam review guide
    - "Resources" web page lists all handouts
    - "Additional reading" web page — if you would like multiple perspectives on course material

- Bring **review questions / topic requests** Monday, or post them to the Padlet