

- **Phonology:**
Mental grammar of sounds
- **Segmental phonology:**
Phonemes and allophones

Background:

- *HW #1, question (3)*
- *Phonetics terms and concepts*

0. Today's plan

- Checking in and setting the stage
- Follow-up discussion from HW #1:
How is the nasal spelled <ん> pronounced?
- Key concepts in **segmental phonology** —
phoneme, allophone
 - Some implications of phonemes and allophones
for learning Japanese or English
- Introduction to phonological rules

1. Review and context

So far in this course:

- **Phonetics**

- How to use **IPA symbols** to “write down” speech sounds, without relying on an individual language’s spelling system
- Terms to **describe vowels and consonants** —
Where and how is the sound made?
 - Lots of new terms to know
 - But usually you can “check”, physically

1. Review and context

- Are there course topics you have questions about?
 - Contribute anonymous comments on the Anonymous Check-in padlet
(See link on today's "Daily syllabus" page)

1. Review and context

Our topic for the next few classes:

- **Phonology** → Sounds in the mental grammar
 - Those phonetics terms actually explain a lot about **how sounds form patterns, cognitively**
 - First we will look at **segmental phonology** (vowels and consonants)
 - Then we will look at **prosodic phonology** (syllables, pitch accent)

2. The pronunciation of <h> in context

- What generalizations were you able to make about the pronunciation of the sound spelled <h>?

2. The pronunciation of <ん> in context

- What generalizations were you able to make about the pronunciation of the sound spelled <ん>?
- Note: The description of <ん> in the Genki textbook is actually a little too simplistic

For more accurate information, see:

- Data set - [“Syllable-final nasals”](#)
- [Sound files on Canvas \(Modules\)](#)

3. Phonology: Sounds in mental grammar

- What generalizations were you able to make about the pronunciation of the sound spelled <h>?
- Big idea here: Some of the phonetic properties of sounds are also used by the **mental grammar**
 - to classify sounds into groups
 - to change one sound into another in some context
- Handout - "Phonemes, allophones, and complementary distribution"

3. Phonology: Sounds in mental grammar

- **Different languages** have different inventories and patterns of speech sounds!
 - Present in one language, absent in another
 - Separate phonemes in one language, allophones of one phoneme in the other
- Both of these scenarios can cause difficulty in **mastering a second language** (“foreign accent”)
 - The phonological grammar of your first language often transfers to new languages that you learn

3. Phonology: Sounds in mental grammar

- Consider the following words of English
 - How are the “t” and “d” sounds pronounced?
 - (a) *let* *letting* (b) *need* *needing*
hot *hotter* *wide* *wider*

3. Phonology: Sounds in mental grammar

- Consider the following words of English
 - How are the “t” and “d” sounds pronounced?
 - (a) *let* *letting* (b) *need* *needing*
hot *hotter* *wide* *wider*
- What we have here is a case of phonemes with multiple allophones:
 - /t/ has [t] and [ɾ] (among others!)
 - /d/ has [d] and [ɾ]

3. Phonology: Sounds in mental grammar

- English phonemes with multiple allophones:
 - /t/ has [t] and [ɾ] (among others!)
 - /d/ has [d] and [ɾ]
 - For both the /t/ and /d/ phonemes, their [ɾ] allophone occurs *when between vowels* as long as the second vowel is *not stressed* (this is a slight simplification)
- What happens when an English-speaking beginning learner of Japanese tries to produce the word [kɯdasai] 'please give me...'? **Why?**
 - See also handout - "[Phonemes, allophones...](#)"

4. Phonological rules

- **Phonological rule** — (One) model of how the mental grammar puts allophones in the right places
target → *change / environment*
 - Write rules using **properties** (not IPA symbols)!

5. Example: Voiced and voiceless vowels

- Data set - “Voiceless vowels”

Applying these phonology concepts:

- Examining the environments for patterns
- Determining whether two sounds have...
 - Predictable environments → Allophones of same phoneme
 - Unpredictable environments → Distinct phonemes
- Writing a phonological rule to account for the allophones of a phoneme

5. Example: Voiced and voiceless vowels

- **Phonological rule** — Our model of how the mental grammar puts allophones in the right places
target → *change / environment*
 - Write rules using **properties** (not IPA symbols)!
- Rule for **voiceless vowels** in Japanese

high vowels → voiceless / voiceless _ voiceless

Paraphrase of rule: High vowels become voiceless when they occur between voiceless sounds.

5. Example: Voiced and voiceless vowels

How to think about this:

- Native speakers of Japanese **mentally categorize** [i] and [i̥] as “the same sound”, /i/
- Words are stored in the **mental lexicon** in terms of phonemes: /ika/ ‘squid’, /kita/ ‘north’
- The mental grammar uses the Voiceless Vowels rule to put [i̥] where it needs to be:
 - /ika/ → [ika] (conditions for rule not met)
 - /kita/ → [ki̥ta] (conditions met; rule applies)
- And likewise for [u] and [u̥]

6. For next time

- Try out the new data sets on your own
 - Part I only of the “[Bilabial, palatal, and glottal fricatives](#)” data set
 - Set (2) only in the “[Alveolar/alveopalatal obstruents, part \(I\)](#)” data set
- What to try (we will also discuss in class next time)
 - Examining the environments for predictability
 - Allophones of same phoneme or not?
 - Writing a phonological rule to account for the allophones of a phoneme