- **Phonological rules**
- **What do we do about *systematic* exceptions to rules?**

Background:

- *Data set - Alveolar/alveo-palatal obstruents*
- *Data set - Bilabial, palatal, and glottal fricatives*

0. Today's plan

- Checking in: Phonemes and allophones
- Rules for alveolar and alveopalatal obstruents
- When allophones aren't allophones…
- …and rules aren't rules

1. Review and context

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

1. Review and context

- **Phonology** — Sound patterns in mental grammar
- **Segmental** phonology — Consonants and vowels

- Some key terms

  phoneme — mental sound category (/… /)

  allophone — surface realization(s) of a phoneme (essentially, actual pronunciation(s); […])

  - Every phoneme has at least one allophone; some have more than one

1. Review and context

- **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)!

- Example: Rule for **voiceless vowels** in Japanese

high vowels	→	voiceless	/	voiceless __ voiceless

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

1. Review and context

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: / **i**ka / 'squid', / k**i**ta / 'north'
- The mental grammar uses the Voiceless Vowels rule to put [i̥] where it needs to be:

  /**i**ka/ → [**i**ka] (conditions for rule not met)
  /k**i**ta/ → [k**i̥**ta] (conditions met; rule applies)

- And likewise for [ɯ] and [ɯ̥]

2. Alveolar and alveopalatal obstruents

Data set - "Alveolar/alveopalatal obstruents, part (I)"

- What do we conclude for [ɕ] vs. [s]?
  - Are their environments predictable?
  - Should we analyze these as separate phonemes, or as allophones of the same phoneme?

2. Alveolar and alveopalatal obstruents

Data set - "Alveolar/alveopalatal obstruents, part (I)"

- What do we conclude for [t] vs. [tɕ] vs. [ts]?
  - Are their environments predictable?
  - Should we analyze these as separate phonemes, or as allophones of the same phoneme?

2. Alveolar and alveopalatal obstruents

Data set - "Alveolar/alveopalatal obstruents, part (I)"

- What **phonological rules** do we need to propose for these phonemes and allophones?

  Reminder — For phoneme with multiple allophones:

  - Determine the default, general allophone and use this to label the phoneme
  - Any other allophone(s) need phonological rules
  - Rules are stated in terms of properties

- Handout - "Alv/alvpal obstr, part (I) | DISCUSSION" (Sakai)

2. Alveolar and alveopalatal obstruents

Data set - "Alveolar/alveopalatal obstruents, part (I)"

- What **phonological rules** do we need to propose for these phonemes and allophones?
- Does our analysis make the kunrei romanization system make more sense?

3. Bilabial, palatal, and glottal fricatives

Work groups:

- **Data set** - "Bilabial, palatal, and glottal fricatives"
  Now we'll look at Part II
  - Open this data set on your own device
    (also linked from Daily syllabus page on course web site)

- Goals:
  - Are we seeing evidence for separate phonemes, or multiple allophones of the same phoneme?
  - How can we reconcile the analysis of Part II with the analysis of Part I?

3. Bilabial, palatal, and glottal fricatives

Debriefing:

- **Data set** - "Bilabial, palatal, and glottal fricatives"
- Some points to note:
  - Part II shows [ɸ] in **all** contexts
  - Part II consists of (recent) loanwords
  - Part II still shows /h/ → [ɸ] / _ [ɯ]
    /h/ → [ç] / _ [i]
- In loanwords, there is a phoneme /ɸ/ as well as /h/
  - The /h/ still undergoes the usual rules

4. Alveolars and alveopalatals, revisited

- **Data set** - "Alveolar/alveopalatal obstruents, pt (II)"
  - Focus on the recent loanwords data in (5)
- Consider the same questions here:
  - Are we seeing evidence for separate phonemes, or multiple allophones of the same phoneme?
  - How can we reconcile the analysis of Part II with the analysis of Part I?

4. Alveolars and alveopalatals, revisited

- **Data set** - "Alveolar/alveopalatal obstruents, pt (II)"
  - Focus on the recent loanwords data in (5)
- The situation is even more interesting here!
  - Is there evidence for /s/ and /ɕ/ as separate phonemes in loanwords?
  - What about /t/ and /tɕ/ and /ts/?
  - Do /s/ and /t/ still undergo the usual rules in loanwords, the way /h/ does?
- Note: We will come back to the Sino-Japanese examples in (4) a little later

5. Implications for linguistic theory

- What are some of the differences between “native” and “loanword” items in Japanese?
  - “Loanword” items have more phonemes
  - Some phonological rules are suspended in “loanword” items

- Our approach to the phonological mental grammar for human language in general must be able to handle these facts