

Homework assignment #2: Natural classes and phoneme analysis

Due **Tuesday, February 2 by 11:00am** in “Assignments” on Sakai

Please submit your assignment as a PDF if typed, or as a PDF or image file (JPG, PNG) if handwritten and scanned. Please double-check that handwritten submissions and/or image files are legible—do not try to squeeze your answers onto this assignment handout. Note that IPA symbols and Japanese characters can be copied from course PDFs or web pages and pasted into your documents!

- (1) Some hiragana symbols have a diacritic called *dakuten*, which looks like a double quotation mark (`). (If you don't read Japanese, use the online kana charts to help you answer this question.)
 - (a) Give a kunrei transliteration (romanized spelling) for the **consonant** represented in each of the following hiragana symbols with dakuten: ど ぎ ぜ
 - (b) Now give a kunrei transliteration for the **consonant** represented in each of the corresponding basic hiragana symbols (with no dakuten): と き せ
 - (c) The *transliterations* you just gave happen to be appropriate *phonetic transcriptions* as well (for these particular hiragana symbols). Given this, what difference in sound properties is represented by the addition of the dakuten mark to the symbols in (b)?
 - (d) The following hiragana symbols never take dakuten: ま ね り わ. These are also symbols whose transliterations are a good match for their pronunciations. Use **phonetic properties** to explain what the consonants represented by these symbols have in common, and why these symbols do not appear with dakuten.
 - (e) Here is another hiragana symbol that does take dakuten: ぼ. The corresponding basic hiragana symbol is ば. Again assuming that the transliterations are good indications of the phonetic transcriptions for these symbols, explain what is **unexpected** about the sound value of ぼ, given the sound value of ば and the relationship between hiragana symbols with and without dakuten discussed in part (c).

- (2) Some speakers of Japanese, especially older speakers in particular districts of Tokyo, have the following distribution of the sounds [ŋ] and [g]. (Data from Vance 2008 and JDIC.)

[atsuaŋe]	‘thick fried tofu’	[naŋai]	‘long’
[so:ŋu:]	‘encounter’	[tamanen̄i]	‘onion’
[kaŋi]	‘key’	[ko:ŋjo:]	‘industry’
[ju:rikaŋo]	‘cradle’	[ɕiŋe]	‘beard’
[ɸuŋɰ]	‘pufferfish’	[giri]	‘obligation’
[ga:kɔ:]	‘school’	[geta]	‘wooden clogs’
[gohan]	‘cooked rice’	[gu:zen]	‘coincidence’

 - (a) Are the environments of [ŋ] and [g] predictable or unpredictable in this data set?
 - (b) Provide evidence for your claim in (a) by describing the environments in which the sounds occur. Be systematic — make use of sound properties and natural classes.
 - (c) How many distinct phonemes are represented by [ŋ] and [g] here? If you think there are two phonemes, explain why. If you think there is one phoneme with multiple allophones, choose a “name” for the phoneme and state a phonological rule that will produce the other allophone in the other context.

- (3) This question refers to the data set “Syllable-final nasals in Japanese,” available from the Daily syllabus web page.

As we discussed in class, the words in sets (1)–(4) of this data set follow the generalization that you identified in Homework Assignment #1 about the place of articulation of the following sound. However, this generalization does not apply to the words in sets (6)–(8).

- (a) Use the set of phonetic properties we have been working with to describe the sounds that follow the nasal spelled <ŋ> in each of these sets of words, in a way that distinguishes them from all other sets of words in the data set:
- set (6)
 - set (7)
 - set (8)
- (b) Is it possible to state a single consistent description, using our set of phonetic properties, for the sounds that follow the nasal spelled <ŋ> in sets (1) and (2) taken together? If so, state this description; if not, explain why not.
- (c) Given our set of phonetic properties, it is *not* possible to state a single consistent description for the sounds that follow the nasal spelled <ŋ> in all four sets (1)–(4). This is an open-ended question: can you speculate about what these sounds might have in common in terms of their physical articulation, that distinguishes them from the sounds in sets (6)–(8)?
- (d) We saw in class that the sounds [z] and [dz] are in free variation in word-initial position (when the following vowel is not [i]), but after a nasal, typically [dz] occurs and not [z]. Is this fact related to any of the patterns you have identified in this question? Explain.