

## Voiceless vowels in Japanese

The vowels [i̥] and [u̥] are voiceless (as indicated by the subscript [̥]). (Sometimes they are perceptually indistinguishable from a neighboring voiceless fricative, but from a mental-grammar perspective, they are most insightfully analyzed as voiceless vowels.)

- [i̥] and [u̥] are the only (phonologically) voiceless vowels in Japanese. Use phonetic properties to state the natural class of “potentially voiceless vowels”.
- Consider the distribution of [i̥] and [u̥]. Should these be considered independent phonemes of the language, or allophones of some other phoneme? Defend your analysis, and state the distribution of allophones if relevant.

|                |                     |                |                     |
|----------------|---------------------|----------------|---------------------|
| [ ika ]        | ‘squid’             | [ ɕikaru ]     | ‘scold’             |
| [ ki desu ka ] | ‘is it a tree?’     | [ kɪta ]       | ‘north’             |
| [ tsuda ]      | (surname)           | [ tɕikai ]     | ‘near’              |
| [ kuɕai ]      | ‘smelly’            | [ kigen ]      | ‘mood’              |
| [ ɕizuka ]     | ‘quiet’             | [ kisen ]      | ‘steamship’         |
| [ kagitai ]    | ‘(I) want to sniff’ | [ totɕi da ]   | ‘it’s land’         |
| [ suki da ]    | ‘(I) like it’       | [ midzɪkai ]   | ‘short’             |
| [ takusan ]    | ‘a lot’             | [ kokuɡo ]     | ‘Japanese language’ |
| [ udon ]       | ‘type of noodle’    | [ izumo ]      | (place name)        |
| [ ɕitsuɰoː ]   | ‘necessary’         | [ katsɰ ɕito ] | ‘winning person’    |
| [ uɕiro ]      | ‘back’              | [ pɪkaso ]     | ‘Picasso’           |
| [ kɪtɕigai ]   | ‘crazy person’      | [ ɸɰɕin ]      | ‘suspicion’         |

Data from Tsujimura (2007)

- There is a little more to the story about voiceless vowels (Vance 2008, Tsuchida 2001):
  - (a) In the environment between {the relevant consonant class} and a pause, potentially voiceless vowels appear as voiceless sometimes, but not as consistently. (The forms /des-u/ ‘COPULA.FORMAL-NONPAST’ and /-mas-u/ ‘FORMAL-NONPAST marker for verbs’, on the other hand, are *very* consistently devoiced in final position.)
  - (b) Sometimes additional vowels are voiceless at the phonetic, rather than phonological, level — particularly in fast speech.
  - (c) Having two voiceless vowels in a row is sometimes avoided. If so, additional factors come into play to determine which vowel actually appears as voiceless.