

**A more advanced analysis: Alveolar/alveopalatal obstruents**

- (1) How do we decide whether two sounds should be classified as separate phonemes, or allophones of the same phoneme? Two major sources of evidence.
- (a) **Complementary distribution:** If you know what the **environment** is, can you **predict** which sound will appear?
- (b) Does a **single morpheme** (“word piece”) show an **alternation** between two sounds?
- (2) Consider the following verb forms:
- |                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                            |
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| <p>(a) [ ma<u>t</u>anai ]      ‘not wait’</p> <p>     [ ma<u>t</u>o: ]      ‘let’s wait’</p> <p>     [ ma<u>t</u>eru ]      ‘can wait’</p> <p>     [ ma<u>t</u>sɯ ]      ‘wait(s)’</p> <p>     [ ma<u>t</u>imasu ]      ‘wait(s)-FORMAL’</p> | <p>(b) [ hana<u>s</u>anai ]      ‘not speak’</p> <p>     [ hana<u>s</u>o: ]      ‘let’s speak’</p> <p>     [ hana<u>s</u>eru ]      ‘can speak’</p> <p>     [ hana<u>s</u>u ]      ‘speak(s)’</p> <p>     [ hana<u>s</u>imasu ]      ‘speak(s)-FORMAL’</p> |
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- (c) [ zondzuru ]      ‘think(s).HUMBLE’
- [ zondzimasu ]      ‘think(s).HUMBLE-FORMAL’
- What relevant phenomenon is exemplified by these verb forms?
- (3) Now consider the data set handouts “Alveolar/alveopalatal obstruents”:
- (a) What kind of distribution do we see in sets (1)-(3) in Part I?
- Is it consistent with the verb data presented above?
- (b) What kind of distribution do we see in the sets in Part II?
- Is it consistent with the verb data presented above?
  - What is a potentially relevant difference between the words in Part I vs. the words in Part II?
- (4) Can we solve the problem by taking the same approach to the alveolar/alveopalatal cases as we did for /h/ vs. a loanword-specific /ϕ/?
- (5) No — that approach (alone) isn’t enough:
- (a) Problem #1: The data in “Alveolar/alveopalatal obstruents, part II,” set (4) aren’t recent foreign loanwords → *but see section II of this handout for a different solution*
- (b) Problem #2: The verb data in (2) above show that the alveolar cases are crucially different from the /h/ vs. /ϕ/ cases → *see section III of this handout*

## II. How to analyze [ɕa] [ɕo] [ɕu] (etc.)

(6) The data in “Alveolar/alveopalatal obstruents, part II,” set (4) provide examples of what appear to be **contrasts** between alveolar and alveo-palatal sounds in the same environment

(a) [ <u>ta</u> bete ]	‘eating’	vs.	[ <u>tɕ</u> a ]	‘tea’
[ <u>to</u> kei ]	‘clock’	vs.	[ <u>tɕo</u> :me ]	‘(city) block’
[ <u>tsu</u> kau ]	‘uses’	vs.	[ <u>tɕu</u> :mon ]	‘order’
(b) [ <u>sa</u> kuwa ]	‘cherry’	vs.	[ <u>ɕ</u> akai ]	‘society’
[ <u>oso</u> i ]	‘slow’	vs.	[ <u>ɕo</u> :bai ]	‘business’
[ ɕimas <u>u</u> ]	‘do-FORMAL’	vs.	[ <u>ɕu</u> :matsu ]	‘weekend’
(c) [ ( <u>d</u> )zannen ]	‘regrettable’	vs.	[ <u>ɖ</u> zama ]	‘impediment’
[ kaz <u>o</u> ku ]	‘family’	vs.	[ <u>ɖ</u> zosei ]	‘woman’
[ ku <u>z</u> u ]	‘kudzu’	vs.	[ <u>ɖ</u> zu:ɕo ]	‘address’

- From the perspective of the analysis where [tɕ ɕ dz] are allophones of /t s z/ respectively, this looks like some allophones are appearing in the “wrong context”
- But, in what follows we will see evidence that this is not the whole story

(7) Japanese has a process called **mimetic palatalization**

(a) Mimetics = adverb-type elements; onomatopoeia

(b) Mimetic palatalization: Adds an element of “uncontrolledness” to the base meaning

(c) Examples (I) | Analysis = add /j/ to a consonant in the mimetic form

[poko-poko] ‘up/down movement’	[pjoko-pjoko] ‘jumping around imprudently’
[noro-noro] ‘slow movement’	[njoro-njoro] ‘slow, wriggly movement’

(d) Examples (II) | Analysis = ???

[kata-kata] ‘steady hitting sound’	[katɕa-katɕa] ‘clattering sound’
[kasa-kasa] ‘dry rustling sound’	[kaɕa-kaɕa] ‘noisy rustling sound’
[zabu-zabu] ‘splashing’	[ɖzabu-ɖzabu] ‘splashing indiscriminately’

(8) The glide [j] in Japanese can appear only before [u o a] (what natural class is this?)  
Furthermore, many phonologists propose that *glides* = *high vowels*, so [j]=[i] at some level

(9) Proposal: The alveopalatals before [u o a] actually involve a [j] glide in the sequence

[tɕa] = /tja/      [ɕu] = /sju/      [ɖzo] = /zjo/    etc.

- To generate the correct surface form, we also need a rule that **deletes** /j/ when it follows an alveopalatal obstruent:  

palatal	→	Ø	/	alveopalatal	_____
glide				obstruent	

- (10) The kana spelling system happens to reinforce this analysis  
(This is nice! But — remember that phonological evidence is the most important)
- [kja] (/kja/): きゃ (<ki> + small <ya>)
  - [ɕa] (/sja/): しゃ (<si> + small <ya>)
- (11) Based on the phonological analysis of the /Cja Cju Cjo/ cases that we have just developed, what can we now say about the distribution of the alveo-palatals [ɕ tɕ dz] in (4) of the “Alveolar/alveopalatal obstruents, part II” data set?

### III. What to say about the foreign loanwords

- (12) If we assume the following phonemes and allophones for Japanese, can we explain the data in (5) of the “Alveolar/alveo-palatal obstruents, part II” data set?

<i>phonemes</i>	/t/	/s/	/z/
<i>allophones</i>	[t] [tɕ] [ts] /_[i] /_[ɰ]	[s] [ɕ] /_[i]	[z] [dz] [dʒ] /_[i] /[_N]_ (optionally) #_

- (13) How about if we add to the analysis in (12) the following phonemes, which appear contrastively only in loanwords? (This is the approach we took with /h/ vs. /ɸ/.)

/ts/ /tɕ/ /ɕ/ /dz/

- (14) This still does not completely solve the problem — the loanword data appear to be incompatible with the verb alternation data. (Do you see why?)

- (15) Final proposal:

(a) Add **new loanword-only phonemes** to the inventory, as we did for /ɸ/: now we recognize /ts tɕ ɕ dz/ (in loanwords)

(b) State that some of the **allophone rules are restricted** only to non-loanwords

- This last step is necessary if we are to account for both loanwords and verbs:

<i>Surface form</i>	<i>Phonological analysis</i>
[ti:] ‘tea’	/ti:/ with <b>no</b> /t/ → [tɕ] rule
[matɕimasu] ‘waits-formal’	/mati.../ <b>with</b> /t/ → [tɕ] rule

(Optional) readings for more information — see online Reading List for links

- On mimetic palatalization, and which consonant in a form is affected:  
Mester, R. Armin, and Junko Itô (1989). "Feature predictability and underspecification: Palatal prosody in Japanese mimetics." *Language* 65(2): 258-293.
- On modeling a grammar where words of different lexical classes (i.e., native words vs. loanwords) have different phonological patterns in the framework of Optimality Theory:  
Itô, Junko, and Armin Mester (1999). "The Phonological Lexicon." In Natsuko Tsujimura (ed.), *A Handbook of Japanese Linguistics*. Oxford: Blackwell.