

Underlying Representation

from Iggy Roca and Wynn Johnson (1999) *A Workbook in Phonology*. Blackwell. Language information from www.ethnologue.com.

I Japanese

In Japanese, the sounds [s,t] are in complementary distribution with [š,č]:

1.	kesa	'this morning'	10.	tatari	'curse'
2.	ašita	'tomorrow'	11.	čikaku	'near'
3.	osoi	'slow, late'	12.	ita	'board'
4.	šimasu	'(I will) do (it)'	13.	keči	'stingy'
5.	kusaru	'to rot'	14.	satori	'realization'
6.	muši	'insect'	15.	otoko	'man'
7.	ase	'sweat'	16.	moči	'rice cake'
8.	miso	'soy bean paste'	17.	uči	'house'
9.	toši	'year'			

1. What is the distribution of [s,t]? Of [š,č]?
2. What are the underlying forms of these phonemes? How did you come to this conclusion?
3. Write a phonological rule to derive the phonetic forms from the underlying forms.

II. German

Consider the distribution of German obstruents in the following data. (The data are given in German orthography except for the obstruents we are examining. $w=[v]$, $v=[f]$, $au=[aw]$, $ei=[ay]$, final $e=[ə]$.)

1.	Ta[k]	'day'	Ta[g]e	'days'
2.	Rau[p]	'robbery'	rau[b]en	'to rob'
3.	lei[t]	'sorry'	lei[d]en	'to suffer'
4.	Lo[p]	'praise'	lo[b]en	'to praise'
5.	We[k]	'way'	We[g]e	'ways'
6.	Lan[t]	'land'	lan[d]en	'to land'
7.	Grei[s]	'old man'	Grei[z]es	'old men'
8.	bra[f]	'obedient' (predicate)	bra[v]er	'obedient' (masculine)
9.	Ra[t]	'advice'	ra[t]en	'to advise'
10.	Vol[k]	'people'	Vol[k]e	'peoples'
11.	Perisko[p]	'periscope'	Perisko[p]e	'periscopes'
12.	Ho[f]	'courtyard'	Hö[f]e	'courtyards'
13.	Ro[s]	'horse'	Ro[s]e	'horses'

1. What is the underlying form of the alternating obstruents in the data, and why?
2. Give a phonological rule to derive the phonetic forms.

German is a West Germanic language with over 95,000,000 speakers, the official language of Germany, Austria, Liechtenstein, Luxembourg, and Switzerland, and spoken widely in surrounding countries. Japanese is a language of uncertain affiliation (although it has been controversially linked to the Altaic family) with over 122,000,000 speakers, mostly in Japan.