

## 6. UNDERLYING FORMS: DISCUSSION PROBLEMS

### POLISH<sup>1</sup>

		Singular	Plural	Underlying			Imperative	1 <sup>st</sup> singular	Underlying
1.	'noise'	ɟum	ɟumi	ɟum	18.	'ox'	vuw	vowi	vow
2.	'soup'	zur	zuri	zur	19.	'fight'	buj	boji	boj
3.	'corpse'	trup	trupi	trup	20.	'crib'	ʒwup	ʒwobi	ʒwob
4.	'bow'	wuk	wuki	wuk	21.	'ice'	lut	lodi	lod
5.	'club'	klup	klubi	klub	22.	'cart'	vus	vozi	voz
6.	'labor'	trut	trudi	trud	23.	'knife'	nuɟ	noʒe	noʒ
7.	'rubble'	grus	gruzi	gruz	24.	'horn'	ruk	rogi	rog
8.	'lye'	wuk	wugi	wug	25.	'protect'	xron <sup>j</sup>	xron <sup>j</sup> e	xron <sup>j</sup>
9.	'house'	dom	domi	dom	26.	'shuck corn'	kop	kop <sup>j</sup> e	kop <sup>j</sup>
10.	'bell'	ɖzvon	ɖzvoni	ɖzon	27.	'frolic'	psots̄	psot <sup>s̄</sup> e	psots̄
11.	'sheaf'	snop	snopi	snop	28.	'shave'	ogul	ogole	ogol
12.	'cat'	kot	koti	kot	29.	'stand'	stuj	stoje	stoj
13.	'nose'	nos	nosi	nos	30.	'do'	rup	rob <sup>j</sup> e	rob <sup>j</sup>
14.	'basket'	koɟ	koɟi	koɟ	31.	'lead'	vuts̄	vod <sup>s̄</sup> e	vod <sup>s̄</sup>
15.	'juice'	sok	soki	sok	32.	'open'	otvuɟ	otvoʒe	otvoʒ
16.	'forest'	bur	bori	bor	33.	'catch'	zwuf	zwov <sup>j</sup> e	zwov <sup>j</sup>
17.	'salt'	sul	soli	sol					

(1) Items 1-15: Isolate roots and affixes, note any alternations in ROOTS, propose underlying forms, and propose a rule to derive the phonetic forms.

(2) Items 16-24: In addition to the consonant alternations seen in 1-15, the vowels alternate. Propose underlying forms and a rule to derive the phonetic vowels. HINT: Look at each set of words where vowels do NOT alternate to see whether there is something about that group that distinguishes it from items 16-24.

(3) Rule ordering: You should now have two rules. Use derivations to show that they must be ordered.

<sup>1</sup> Data come from Kenstowicz and Kisseberth (1979:72-73).

**Polish Solution**

Items 1-15 (as well as all others):

DEVOICING: [-sonorant] → [-voice] / \_\_\_#

“Any obstruent (= [-sonorant] consonant) is devoiced at the end of a word.”

Items 16-24 (as well as 28-33):

VOWEL RAISING:  $\left[ \begin{array}{l} + \text{syllabic} \\ - \text{high} \\ - \text{low} \\ (? + \text{back}) \\ (? + \text{round}) \end{array} \right] \rightarrow [+high] / \text{---} \left[ \begin{array}{l} -\text{syllabic} \\ +\text{voice} \\ -\text{nasal} \end{array} \right]_{\text{word}}$

“o → u before a voiced consonant other than a nasal (note, for example, #9) at the end of a word.”

The data give us information only about /o/. The question marks indicate uncertainty as to whether the rule actually only applies to /o/ or whether it could be generalized to any mid vowel.

Ordering: VOWEL RAISING has to apply before DEVOICING, because DEVOICING destroys the environment for vowel raising. Were the rules applied in the opposite order, VOWEL RAISING would apply only before sonorant consonants.

<b>Underlying</b>	/lod/ ‘ice’	/sol/ ‘salt’
<b>Vowel Raising</b>	lud	sul
<b>Devoicing</b>	lut	-----
<b>Phonetic</b>	[lut]	[sul]

<b>Underlying</b>	/lod/ ‘ice’	/sol/ ‘salt’
<b>Devoicing</b>	lot	-----
<b>Vowel Raising</b>	-----	sul
<b>Phonetic</b>	*[lot]	[sul]

Items 26, 30, 33 vs. item 25: It looks like the following rule applies, though there is not enough data for conclusive verification.

DEPALATALIZATION  $\left[ \begin{array}{l} -\text{syllabic} \\ -\text{coronal} \end{array} \right] \rightarrow [-\text{palatalized}] / \text{---}\#$

“A non-coronal consonant is depalatalized at the end of a word.”

There seems to be no other way to predict the palatalization of the consonants in items 26, 30, 33 when case endings are added. Note that there is no official feature “[palatalized]”. Perhaps we could call it [+high], but this specification is undefined for labial consonants.

TAGALOG<sup>2</sup>

		<b>Isolation</b>	<b>Suffix 1</b>	<b>Suffix 2</b>	<b>Underlying</b>
1.	‘open’	<b>bukas</b>	<b>buksin</b>	<b>buksan</b>	<b>bukas</b>
2.	‘fill’	<b>laman</b>	<b>lamnin</b>	<b>lamnan</b>	<b>laman</b>
3.	‘redeem’	<b>tubos</b>	<b>tubsin</b>	<b>tubsan</b>	<b>tubos</b>
4.	‘cut’	<b>putol</b>	<b>putlin</b>	<b>putlan</b>	<b>putol</b>
5.	‘embrace’	<b>kapit</b>	<b>kaptin</b>	<b>kaptan</b>	<b>kapit</b>
6.	‘clothe’	<b>damit</b>	<b>damtin</b>	<b>damtan</b>	<b>damit</b>
7.	‘stop’	<b>opos</b>	<b>upsin</b>	<b>upsan</b>	<b>opos</b>
8.	‘tuft’	<b>posod</b>	<b>pusdin</b>	<b>pusdan</b>	<b>posod</b>
9.	‘suffer’	<b>bata</b>	<b>bathin</b>	<b>bathan</b>	<b>batah</b>
10.	‘buy’	<b>bili</b>	<b>bilhin</b>	<b>bilhan</b>	<b>bilih</b>
11.	‘open’	<b>dipa</b>	<b>diphin</b>	<b>diphan</b>	<b>dipah</b>
12.	‘saddle bag’	<b>pujo</b>	<b>pujhin</b>	<b>pujhan</b>	<b>pujoh</b>
13.	‘ask for trifles’	<b>polo</b>	<b>pulhin</b>	<b>pulhan</b>	<b>poloh</b>
14.	‘mat’	<b>banig</b>	<b>banġin</b>	<b>banġin</b>	<b>banig</b>
15.	‘fulfill’	<b>ganap</b>	<b>gampin</b>	<b>gampin</b>	<b>ganap</b>
16.	‘thatching’	<b>atip</b>	<b>aptin</b>	<b>aptan</b>	<b>atip</b>
17.	‘plant’	<b>tanim</b>	<b>tamnin</b>	<b>tamnan</b>	<b>tanim</b>
18.	‘penetrate’	<b>talab</b>	-----	<b>tablan</b>	<b>talab</b>

<sup>2</sup> Data are from Kenstowicz and Kisseberth (1979:72).

### Tagalog Analysis

I hate datasets like this. Although it is not crucial for the phonology, these suffixes DO have some meaning! This might as well be a problem of made up data rather than data from a real language. Likewise, although one can come up with rules, the data supporting them is a bit skimpy. Moreover, there is no information about *front* mid-vowels, so we can't tell whether the /o/ RAISING rule can be generalized to all mid-vowels.

SYNCOPE                     $V \rightarrow \emptyset / VC\_CV$                     #1. /bukas-in/  $\rightarrow$  [buksin]

This is a typical SYNCOPE environment. The generalization is that a vowel can be deleted if it would not result in a CC cluster at the beginning or end of a syllable. Thus, neither vowel can be deleted in *bukas* because the result would be \**bkas* or \**buks*. However, in *buksin*, the syllable break is between the consonants, i.e. *buk.sin*. Note that this has to be SYNCOPE (deleting a vowel) rather than EPENTHESIS (adding a vowel) because otherwise we could not predict what the vowel in the second syllable of the items in the first column would be.

/o/ RAISING                     $\left[ \begin{array}{l} +\text{syllabic} \\ -\text{high} \\ -\text{low} \\ ? + \text{back} \end{array} \right] \rightarrow [-\text{high}] / \_\_\text{CC}$                     #8. /posodin/  $\rightarrow \dots \rightarrow$  [pusdin]

“Raise /o/ to /u/ when it is followed by two consonants.” We would like to know whether this rule also applies to [-back] /e/. Note that the rule must specify “before two consonants” rather than “in a closed syllable”, which is often the more general statement that could apply, because /o/ does not raise in a word like #4 *putol*.

/h/ DELETION                     $/h/ \rightarrow \emptyset / \_\_\_\text{word}$                     #9. /batah/  $\rightarrow$  [bata] (cf. [bathin])

“Delete /h/ at the end of a word.”

/n/ ASSIMILATION                     $\left[ \begin{array}{l} +\text{coronal} \\ +\text{nasal} \end{array} \right] \rightarrow [\alpha\text{p.a.}] / \_\_\_\text{[}\alpha\text{p.a.]}$                     #14. /bangin/  $\rightarrow$  [baŋgin]

“Assimilate /n/ to the point of articulation of a following consonant.” We can see from #6. *damtin* that nasal assimilation does not apply to /m/. There is no evidence for whether or not [ŋ] is an independent phoneme, so we don't know whether the rule might be generalizable to any non-labial nasal.

LABIAL METATHESIS                     $V \left[ \begin{array}{l} +\text{coronal} \\ +\text{labial} \end{array} \right] \left[ \begin{array}{l} +\text{coronal} \\ +\text{labial} \end{array} \right] V \rightarrow \begin{matrix} 1 & 3 & 2 & 4 \\ 1 & 2 & 3 & 4 \end{matrix}$                     #16. /atpin/  $\rightarrow$  [aptin]

“Reverse the order of a labial and a coronal consonant when they fall next to each other.” This is seen in items 15-18. We can tell that this rule applies only when the consonants come next to each other. Comparing items #5. *kapit* and #16. *atip*, we see that order is not predictable when a vowel intervenes. Note the rule format here. This “transformational” format is convenient when two segments are affected at once.

There are (at least) two cases where rules must be ordered with respect to each other. Find the crucial orderings and demonstrate the necessity of ordering using derivations.