

## Representing underlying distinctions between vowels and glides

### 0 Overview

- 1 Are there underlying glides?
- 2 If they do exist, how should they be represented?

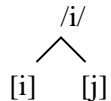
➤ Answering these questions is relevant regardless of what phonological theory one adheres to.

➤ What is meant by *underlying glide*?

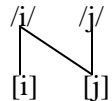
Often phoneme inventories include /j/ and /i/

Often these are really just **one** segment. (syllabification).

Common in languages:



Also existing:



(A question that will not be dealt with here is whether this representation should be universal.)

### 1 Existence of underlying glides

- There is debate over the existence of underlying glides:
  1. No underlying glides exist (Kaye & Lowenstamm 1984, Levin 1985)
  2. Underlying glides do exist (Clements & Keyser 1983, Hyman 1985, Waksler 1990)

➤ Nonetheless, underlying glides do exist.

#### 1.1 Turkish (Levi 2001)

1. If the output glides were derived from underlying vowels, then there would be abundant disharmonic *native* roots.
  - (1) \*/tʃai/, \*/koi/, \*/kai-/
  - (2) a. /tʃaj/ → [tʃaj] 'stream'  
 b. /koj/ → [koj] 'bay'  
 c. /kaj-/ → [kaj-]'slide (verb root)'
2. Glides are transparent to Vowel Harmony, but vowels of course are not.
  - (3) /koj-I/ → [koj-u]'bay-accusative'
  - (4) /paj-I/ → [paj-i] 'share-accusative'
3. Glides are not nuclear (i.e. not diphthongs).
  - (5) Epenthesis: /burn/ → burun 'nose'  
 /bojn/ → bojun 'neck'
  - (6) Stress: HHX [is.tán.bul] 'city in Turkey'  
 HHX [an.tál.ja] 'city in Turkey'  
 \*[án.ta.lja]

### 1.2 Moose Cree (data from Ellis 1983)

1. Nouns and verbs can end in /...Cw/.

- (7) a. /atimw/ → [atim] 'dog'  
 b. /atimw-a/ → [atimw-a] 'dog-obviative'
- (8) a. /pa:skisw/ → [pa:skis] 'shoot him'  
 b. /pa:skisw-e:w/ → [pa:skisw-e:w] 'he shoots him'
2. Third person singular suffix is /-w/.
- (9) /nipa:-w/ → [nipa:-w] 'he sleeps'  
 (10) /takofjin-w → [takofjin] 'he sits'  
 (11) /takofjin-w-ak/ → [takofjin-w-ak] 'they sit'

### 1.3 Pashto (data from Penzl 1955, Bell & Saka 1983)

1. Reverse sonority clusters of the form #[wl, wr, wɽ] and [lw]#.

- (12) a. /wradz/ → [wradz̥] 'day'  
 b. /uriadz/ → [uriadz̥] 'cloud' (Kandahar dialect)
- (13) a. /da:ru/ → [da:ru] 'medicine'  
 b. /dalw/ → [dalw] 'eleventh Afghan month'

2. Phonetics of word initial [wC...]. (output is glide)

When *stretched*, the glide of [wra] did not turn into its cognate vowel.

### 1.4 Karuk (Bright 1957, Herman 1994, Hume 1995)

1. Underlying /w/ patterns with consonants at morpheme boundaries.

- a. Consonant-initial suffixes. (nasalization)
- (14) /apiw/ → [ʔápiw] 'to seek'  
 [ʔápiw-tih] 'to be seeking'
- (15) /ku:r/ → [kú:r] 'to sit'  
 [kú:n-taku] 'to sit on'
- (16) /asuu/ → [ʔásuw] 'to grumble'  
 [ʔásuw-tih] 'to be grumbling'

- b. Vowel-initial suffixes. (deletion)
- (17) /ikiiw/ → [ikjiw] 'to fall'  
 [ikjív-iʃ(rih)] 'to fall down'
- (18) /istʃur-ahi/ → [iʃtʃur-ahi] 'to be cracked'
- (19) /tʃu:phi-a/ → [tʃú:ph-a] 'speech'
- (20) a. /ikriu/ → [ikriw] 'to sit'  
 b. /ikriu-at/ → [ikrê:t] 'lived'

2. Underlying /w/ patterns with consonants with allomorphy selection.

Two allomorphs for the future suffix [-awiʃ] and [-e:ʃ].

- (21) [ʔuʔáw-e:ʃ] 'he will eat' (from /w/)  
 (22) [ʔuʔif-e:ʃ] 'it will grow'
- (23) [ʔuhrô:-wiʃ] 'he will use' (c.f. [ʔúhruw] 'he uses')  
 (24) [niʔáho:-wiʃ] 'I will walk' (c.f. [niʔáho:] 'I walk')

## 1.5 Sundanese (Cohn 1990/1993, Hume 1995)

1. Glides and non-laryngeal consonants block the spread of nasalization.

- (25) a. /ɲatur/ [ɲãtur] 'arrange (active)'  
 b. /ɲuliat/ [ɲũliat] 'stretch (active)'  
 c. /marios/ [mãrios] 'examine (active)'  
 d. /mawur/ [mãwur] 'spread (active)'  
 e. /ɲajak/ [ɲãjak] 'sift (active)'
- (26) a. /ɲiar/ [ɲĩãr] 'seek (active)'  
 b. /mi-asih/ [mĩʔãsih] 'love (active)'  
 c. /mihak/ [mĩhãk] 'take sides (active)'

2. Transitional glides do not block nasalization.

- (27) [ɲĩʔãr] 'seek (active)'  
 (28) [ɲãjak] 'sift (active)'

## 2 How should these underlying glides be represented?

➤ There are three possible ways to represent these underlying glides:

### (1) Lexical Marking:

Under this theory, there are not actually underlying glides, simply underlying vocoids that are marked as *unlinked* to a nuclear/moraic position (≈converse of Levin 1985's lexical prelinking).<sup>1</sup>

<sup>1</sup> NB: This is exactly what Levin 1985 argues against stating that it is often the case that we must talk of V/G alternations as being [+syllabic] but *not* [-syllabic].

- (29) Normal:                      Levin 1985:                      New Proposal:
- |     |               |                           |
|-----|---------------|---------------------------|
| / i | N/μ<br> <br>i | N/μ<br>+<br>+<br>+<br>i / |
|-----|---------------|---------------------------|

Featurally: Underlying vowels and underlying *unlinked* vocoids are identical.

Prediction: Only rules/constraints that refer to *syllable position* can distinguish these two underlying vocoids. Processes that make reference to features will not be able to distinguish them.

### (2) [±consonantal]:

Under this theory, the underlying high vowels are [-consonantal] and underlying glides are [+consonantal].

Previous Uses: This representation has been used by several linguists (Hyman 1985, Waksler 1990, Rosenthal 1994). However, others argue that a glide cannot be [+consonantal] (Hume & Odden 1996<sup>2</sup>).

Definition: Consonantal sounds are produced with a radical obstruction in the midsagittal region of the vocal tract ...at least as narrow as a fricative (SPE).

Constriction: Examining palatograms from several languages, Straka 1964 argues that glides can be produced with more or less constriction than their corresponding vowels.<sup>3</sup>

<sup>2</sup> They write, "we have a hard time imagining what a [+consonantal] vowel would be."

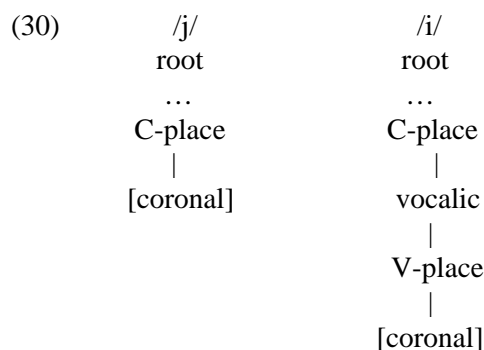
<sup>3</sup> Maddieson & Emmory 1985 show that glides in several languages are produced with more constriction than the corresponding vowels (though they only look at glides adjacent to high vowels).

Featurally: Underlying vowels and glides are identical except for the feature [consonantal].

Predication: Only processes that target [consonantal] and potentially those that refer to syllable position can distinguish vowels and glides.

**(3) Feature Hierarchy:**

Using the division of place features into C-place and V-place, we can distinguish underlying vowels (V-place), consonants (C-place), and glides (C-place).<sup>4</sup>



Featurally: Underlying vowels and glides could have the same features but their location in the hierarchy is different.

Prediction: Glides could be transparent to vocalic processes because they do not have a vocalic node. (e.g. harmony)

But will not be transparent to processes that make reference to C-place features.

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<sup>4</sup> This type of division is used to differentiate two types of output glides in Hume 1995, however, here I am extending this to distinguish underlying glides from underlying vowels.

## 2.1 Turkish

Turkish is the most clear of the 5 examples above.

Lexical Marking: ☹

A diacritic forcing an underlying vocoid in a peripheral position cannot explain the transparency of the glide to VH, while simultaneously explaining the blocking effects of the palatal lateral.

(31) /koj-I/ → [koj-u] 'bay-accusative'

(32) a. /petroλ-I/ → [petroλ-y] 'gas-accusative'  
           \*[petroλ-u]  
       b. /meʃguλ-Im/ → [meʃguλ-ym] 'I am busy'  
           \*[meʃguλ-um]

[±consonantal]: ☹

Using [+consonantal] for the glide still cannot explain the above examples for the same reason. Cannot explain why/how /λ/ creates a harmonic domain, while /j/ does not.

Feature Hierarchy: ☺

Representing the underlying glide with C-place features simultaneously explains why the glide is transparent (has no V-place feature) and why the palatal lateral is not transparent (has a V-place feature). (Levi 2001)

## 2.2 Sundanese

### Lexical Marking: ☹

With identical features between the underlying glide and the vowel, we cannot explain the blocking effects of the glide. We cannot say that non-nuclear segments block nasal spread because not all non-nuclear segments behave this way ([h] and [ʔ] do not block).

- |      |           |           |                       |
|------|-----------|-----------|-----------------------|
| (33) | /ŋajak/   | [ŋãjak]   | 'sift (active)'       |
| (34) | /mi-asih/ | [mĩʔãsih] | 'love (active)'       |
| (35) | /mihak/   | [mĩhãk]   | 'take sides (active)' |

### [±consonantal]: ☹

Using [+cons] for glides might work for Sundanese (Cohn 1990), but then it must also be the case that [h] and [ʔ] are [-cons], a stance that has been debated. (Lombardi 2002 considers ʔ to be [-son] and therefore *cannot* simultaneously be [-cons].)

### Feature Hierarchy: ☹

By using C- vs. V-place, we have a simple explanation of nasal spread. Segments with at C-place dependent are blockers, while those without are not. Because [h] and [ʔ] do not have any place features, they are not blockers. Furthermore, vowels do not have C-place features and therefore do not block nasalization. (Hume 1995)

## 2.3 Karuk

### Lexical Marking: ☹

The behavior of the two different surface glides of Karuk must be explained. If these segments have the same features, there is no way to explain their different behavior in allomorphy selection, nasalization, and deletion.

- |      |                 |                      |                   |
|------|-----------------|----------------------|-------------------|
| (36) | /apiw/ →        | [ʔápiw]              | 'to seek'         |
|      |                 | [ʔápi <u>m</u> -tih] | 'to be seeking'   |
| (37) | /asuu/ →        | [ʔásuw]              | 'to grumble'      |
|      |                 | [ʔásu <u>w</u> -tih] | 'to be grumbling' |
| (38) | /ikiiw/ →       | [ikjiw]              | 'to fall'         |
|      |                 | [ikjíw-iʃ(rih)]      | 'to fall down'    |
| (39) | a. /ikriu/ →    | [ikriw]              | 'to sit'          |
|      | b. /ikriu-at/ → | [ikrê:t]             | 'lived'           |

### [±consonantal]: ☹

Using [±consonantal] could provide a solution. The nasalization could target [+cons] sonorants, the deletion could affect [-cons] segments.

### Feature Hierarchy: ☹

Using C-/V-place for /w/ vs. /u/ explains the differences between the true glide (/w/ → [w]) and the derived glide (/u/ → [w]).

Nasalization affects sonorant consonants (having a C-place dependent).

Deletion affects vocalic segments at the morpheme boundary (having a V-place dependent).

Vowel harmony treats the true glides as transparent (like other consonants).

- |      |                 |                |                        |
|------|-----------------|----------------|------------------------|
| (40) | /pikiiw-Vwra/ → | [pikjíw-iwra]  | 'to fall backwards'    |
| (41) | /ikfuk-Vwra:/ → | [ikfúk-uwra:]  | 'to climb over'        |
| (42) | /axau-Vwruk/ →  | [ʔaxa-wruk]    | 'to slide down a bank' |
|      |                 | (c.f. [ʔaxaw]) |                        |

- Unlike the VH in Turkish, the VH in Karuk *could* be seen as a process that spreads vocalic features from on the syllable tier and therefore we cannot rule out [ $\pm$ consonantal].
- Ideally, the representation should be universal, so I will choose Feature Hierarchy, which is indeed compatible with the Karuk data.

## 2.4 Cree and Pashto

- All three representations could adequately represent the data from Cree and Pashto. The data only provides outputs with or without reverse sonority clusters.
- In order to have a universal representation of glides, I assume that they are also represented with C-place features.

## 3 Conclusions

- ① Underlying glides exist (though they are not as common as one might think).
- ② The best representation is with a feature geometric representation that recognizes different levels of place features.
- ③ This representation should be universal.

Hopeful prediction: If a language has only derived glides than they should pattern with vowels. If a language has underlying glides, then they should pattern with consonants.

(Any other data is appreciated.)

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