

CUNY Conference on the segment

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The CUNY Graduate Center

**The segment
in monostratal phonology**

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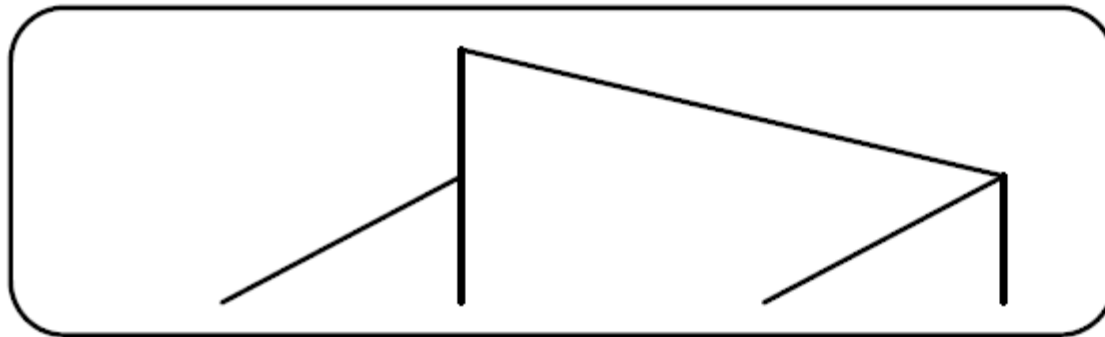
Tohoku Gakuin University, Sendai, Japan

The structure of this talk

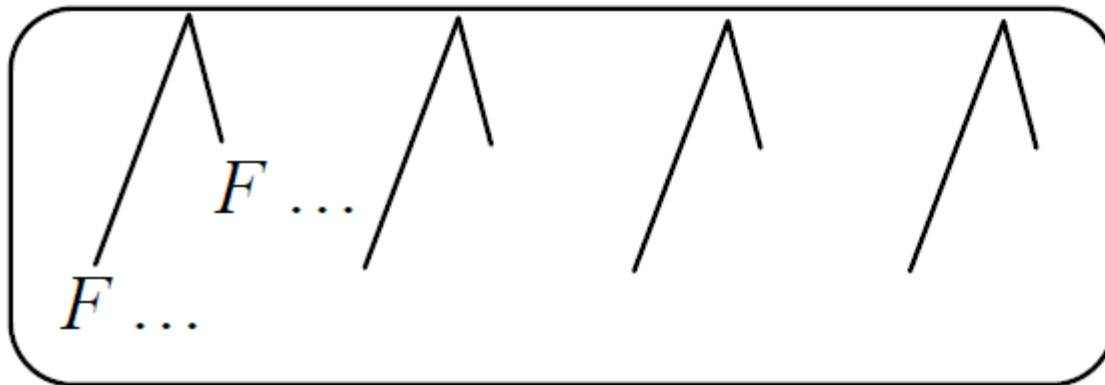
1. The formal status of the segment.
2. The view that features are contrastive and independently interpretable.
3. The representation of the palatal glide *j* in Japanese.
4. *jV* (*ja, ju, jo*) as a **light diphthong** rather than a CV sequence.

Prosody and Melody

The phonological representation of *piti* 'pity'



Prosody



Melody

F = feature

Lexical contrast and phonetic interpretation

(1)

	Classical phonemics	SPE, FG	ET, DP
a. Minimal unit of phonological contrast	the segment	features	features
b. Minimal unit of phonetic interpretation	the segment	the segment	features

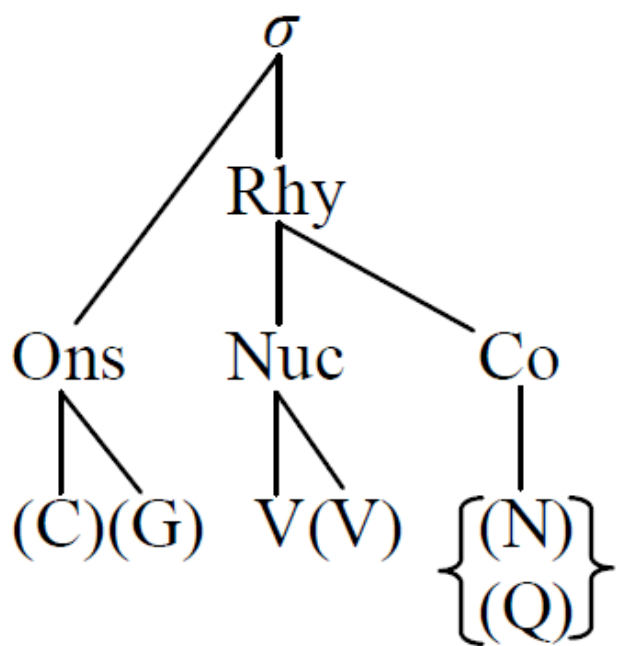
FG = Feature Geometry,

ET = Element Theory, DP = Dependency Phonology

Nasukawa (2004, 2005)

- word-final syllabic nasal is a phonetic manifestation of nasality and empty nucleus.
- geminates are pseudo-geminates in Japanese.
- Japanese is a strict CVCV language which disallows any consonant clusters and consonant endings.

The syllable structure of Japanese



σ = syllable

Rhy = rhyme

Ons = onset

Nuc = nucleus

Co = coda

C = consonant

G = glide

V = vowel

N = syllabic nasal

Q = first part of geminate consonant

k j o o

k a i

‘church’

h o N

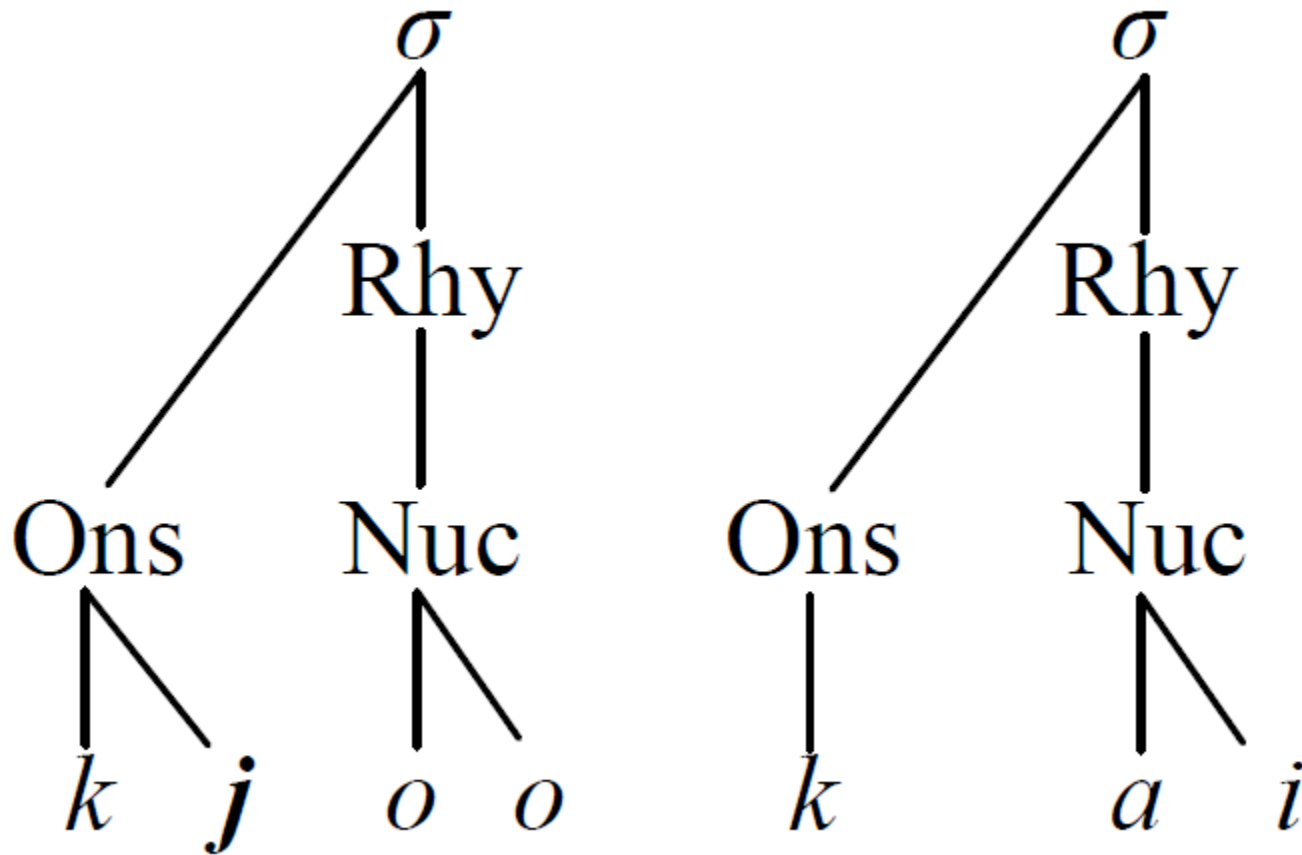
‘book’

k o k k i

‘national flag’

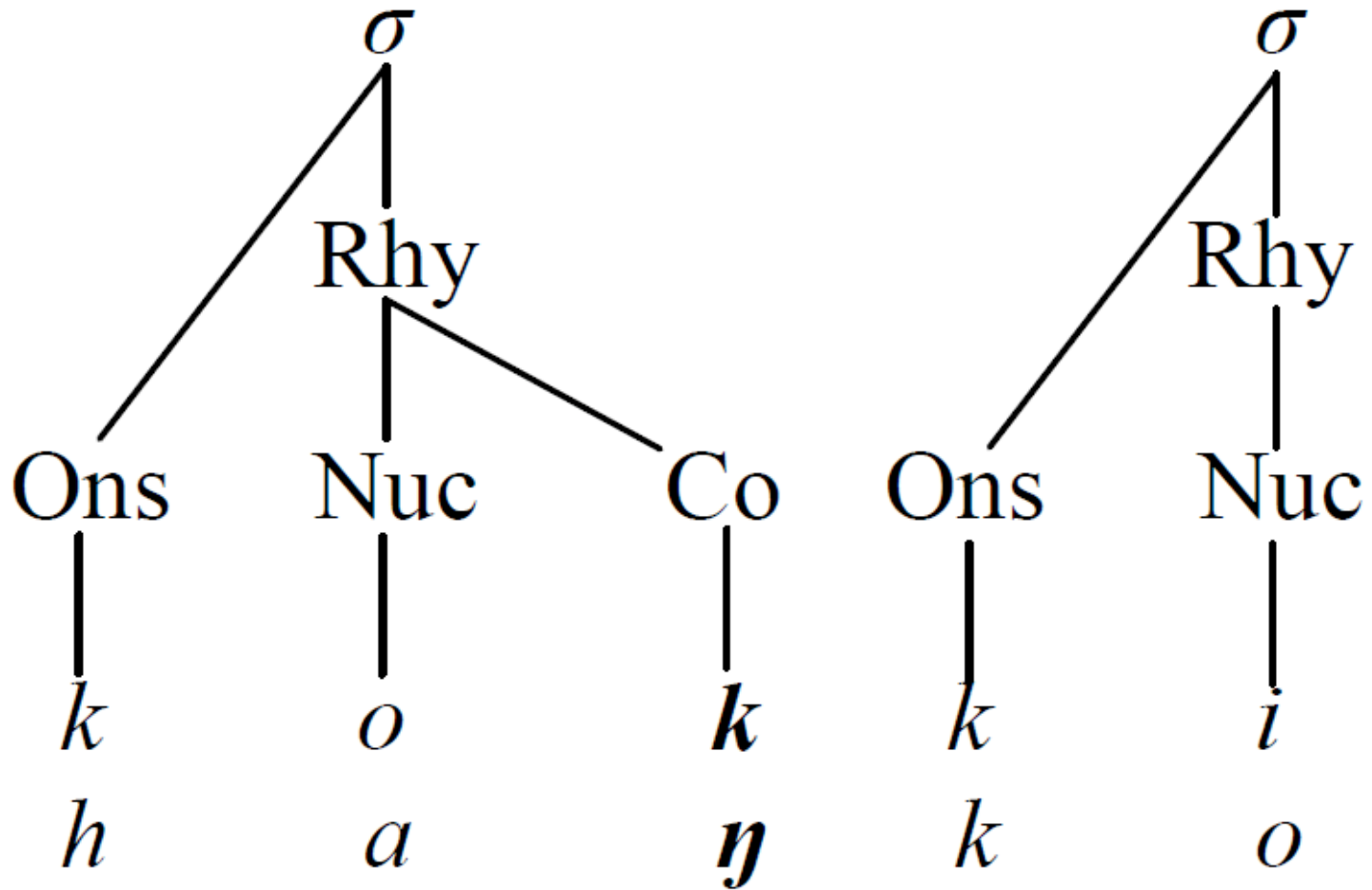
kjookai 'church'

(2)



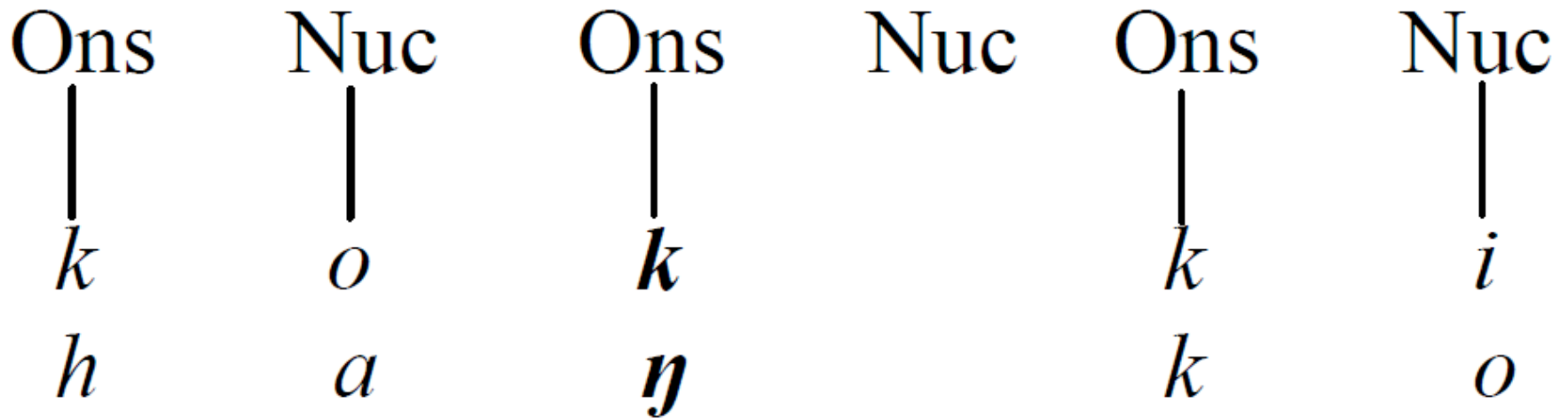
kok.ki 'national flag' and *han.ko* 'stamp'

(3)



kok.ki 'national flag' and *han.ko* 'stamp'

(4)



Possible initial *Cj* in Japanese

(5)

<i>kja</i>	<i>kju</i>	<i>kjo</i>	<i>gja</i>	<i>gju</i>	<i>gjo</i>
<i>sja</i>	<i>sju</i>	<i>sjo</i>	<i>zja</i>	<i>zju</i>	<i>zjo</i>
<i>tja</i>	<i>tju</i>	<i>tjo</i>	<i>dja</i>	<i>dju</i>	<i>djo</i>
<i>hja</i>	<i>hju</i>	<i>hjo</i>	<i>bja</i>	<i>bju</i>	<i>bjo</i>
<i>pja</i>	<i>pju</i>	<i>pjo</i>			
<i>nja</i>	<i>nju</i>	<i>njo</i>			
<i>mja</i>	<i>mju</i>	<i>mjo</i>			
<i>rja</i>	<i>rju</i>	<i>rjo</i>			

Co-occurrence restriction

(6) **Co-occurrence restriction**

A sequence of the palatal glide and a front vowel is disallowed (**ji* and **je*).

Possible initial *jV* in Japanese

(7)

ja ju jo

**ji *je*

Possible initial C in Japanese

(8)

<i>ka</i>	<i>ki</i>	<i>ku</i>	<i>ku</i>	<i>ko</i>	<i>ga</i>	<i>gi</i>	<i>gu</i>
<i>sa</i>	<i>si</i>	<i>su</i>	<i>se</i>	<i>so</i>	<i>za</i>	<i>zi</i>	<i>zu</i>
<i>ta</i>	<i>ti</i>	<i>tu</i>	<i>te</i>	<i>to</i>	<i>da</i>	<i>di</i>	<i>du</i>
<i>ha</i>	<i>hi</i>	<i>hu</i>	<i>he</i>	<i>ho</i>	<i>ba</i>	<i>bi</i>	<i>bu</i>
<i>pa</i>	<i>pi</i>	<i>pu</i>	<i>pe</i>	<i>po</i>			
<i>na</i>	<i>ni</i>	<i>nu</i>	<i>ne</i>	<i>no</i>			
<i>ma</i>	<i>mi</i>	<i>mu</i>	<i>me</i>	<i>mo</i>			
<i>ra</i>	<i>ri</i>	<i>ru</i>	<i>re</i>	<i>ro</i>			

The Japanese syllabary

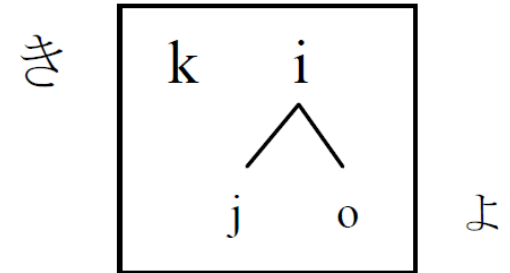
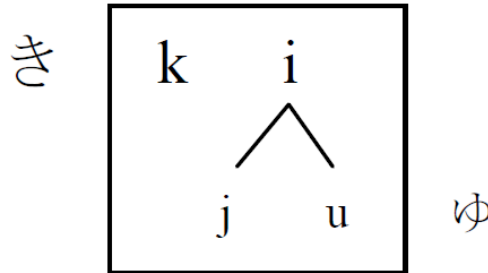
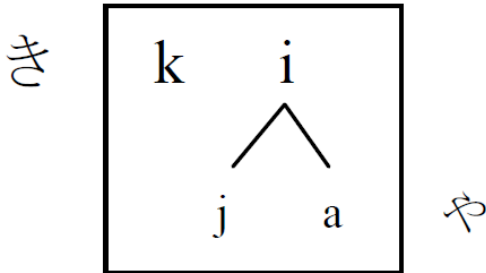
(9)

き (*ki*) や (*ja*) ゆ (*ju*) よ (*jo*)

きや (*kja*)

きゆ (*kju*)

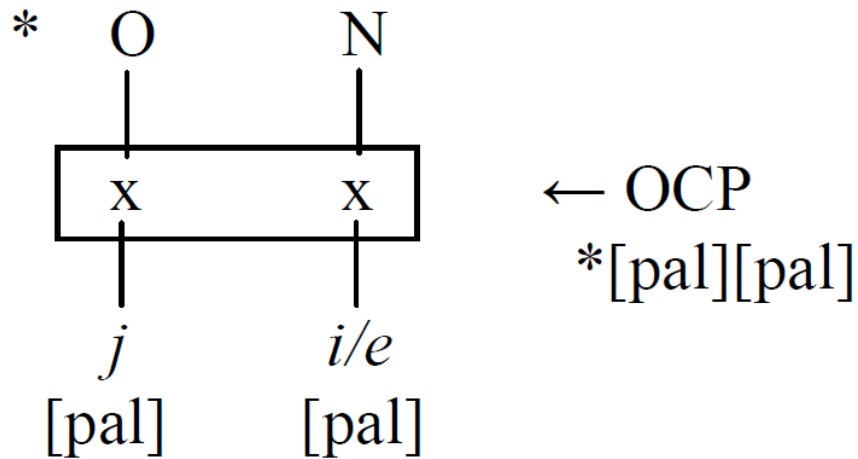
きよ (*kjo*)



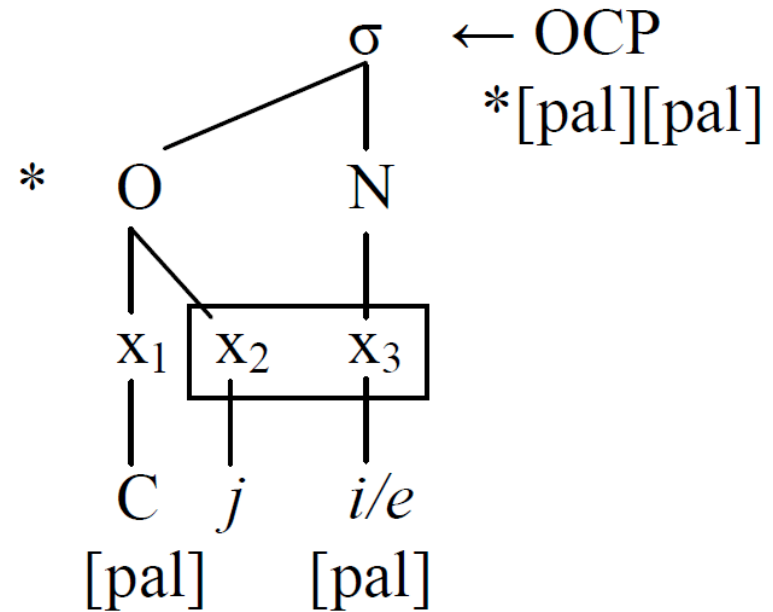
OCP *[pal][pal]

(10)

a.

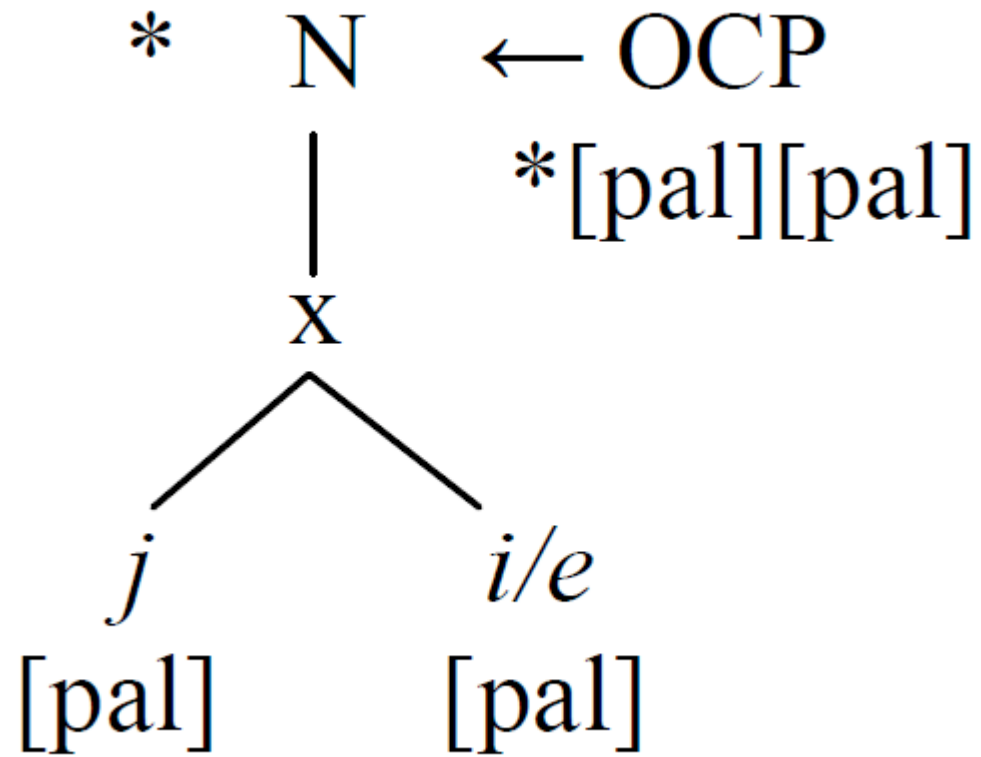


b.



Light diphthong

(11)



Disputable points concerning precedence relations between features

(11)

- a. Hard to provide an explanation for why affricate contours defy typical edge effects (Lombardi 1990)
- b. No clear reasons why the two features in a contour (e.g. [dʒ]) never appear in the reverse order (e.g. *[ʒd])
- c. No account for the fact that the number of sub-segmental timing slots in an affricate is always two

Dependency structures for contour segments 1

(12)

- a. Lombardi (1990) proposes a representation (based on Feature Geometry) which contains the two unordered privative stricture features [cont] and [stop].
- b. Schafer (1995) accommodates Lombardi's proposal and claims that there exists an asymmetric dependency relation between [stop] and [cont].

Dependency structures for contour segments 2

(12)

- c. Nasukawa (2005) proposes that the difference between prenasalised obstruents and voiced obstruents is the headship of intra-segmental organization: the element |murmur| (|N|) is not headed in the former while the same element is headed in the latter.

Dependency structures for contour segments 3

(12)

- d. Nasukawa & Backley (2008) claims that affrication is regarded as a performance device for improving the perceptibility of complex-resonance stops by making multiple place cues more accessible to listeners; this is achieved by enhancing the portion of the speech signal containing aperiodic noise energy, which is relatively rich in place cues.

Elements (Nasukawa & Backley 2008)

(14)

onset

nucleus

| I | (dip)

dental, palatal POA

front Vs

| U | (rump)

labial, velar POA

rounded Vs

| A | (mass)

uvula, pharyngeal POA

non-high Vs

| ? | (edge)

oral/glottal occlusion

creaky voice

(laryngealised Vs)

| H | (noise)

aspiration, voicelessness

high tone

| N | (murmur)

nasality, obs voicing

nasality, low tone

Elements $|I|$ $|U|$ $|A|$

(15)

a. i

b. u

c. a

$|I|$

$|U|$

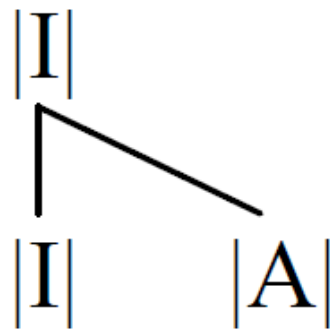
$|A|$

Representing *e* and *o* in Japanese

(16)

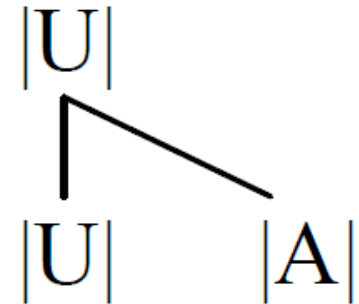
a.

e



b.

o



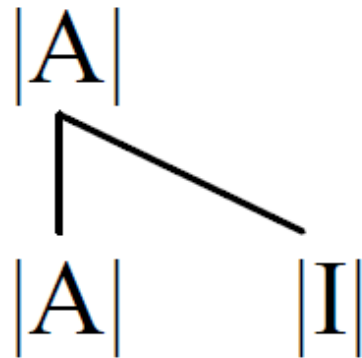
i and *e* often form a class involving the same phonological phenomena in Japanese (e.g. **ji*, **je*, but *ja*, *ju*, *jo*: vowels which occupy verb stem ending are only *i* and *e*, e.g. *mi* ‘see’ and *ne* ‘sleep’).

Representing *ja* and *e* in Japanese

(17)

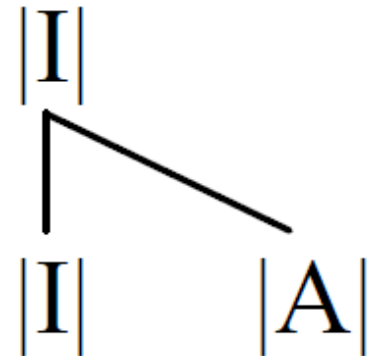
a.

ja



b.

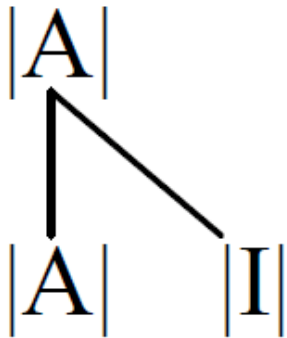
e



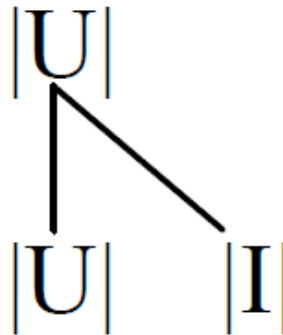
Representing jV in Japanese

(18)

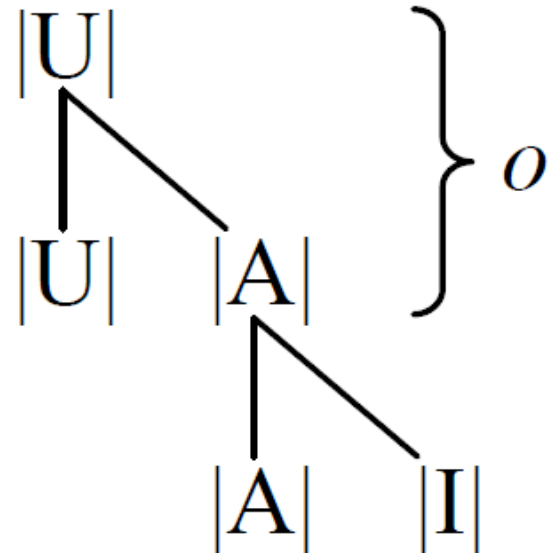
a. *ja*



b. *ju*



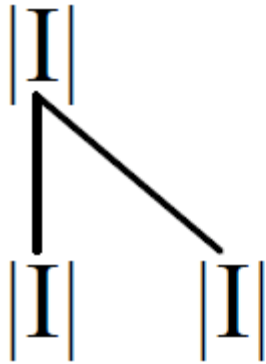
c. *jo*



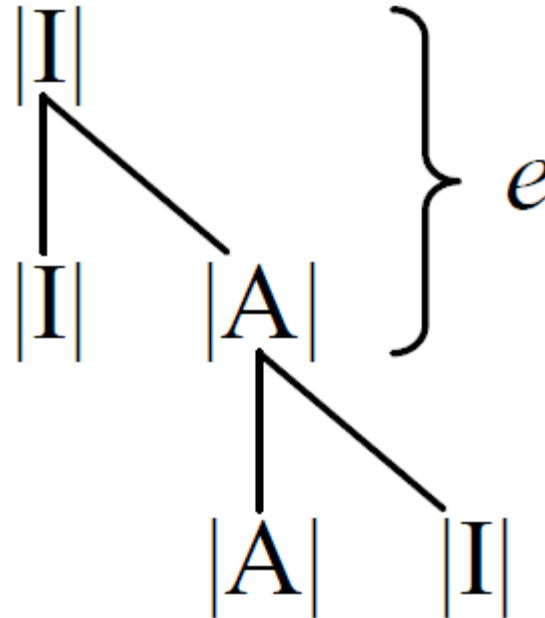
The ill-formed sequences $*ji$ and $*je$

(19)

a. $*ji$



b. $*je$



* ||| → |||

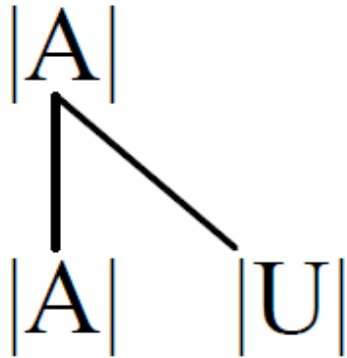
(20) * ||| → |||

||| cannot (in)directly license the same type of element (|||) in a given domain.

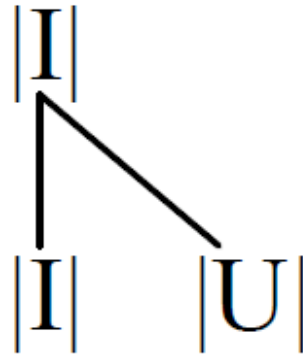
Representing wV in Japanese

(21)

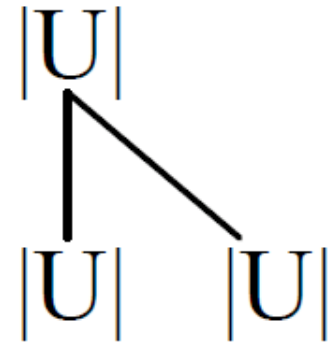
a. *wa*



b. **wi*



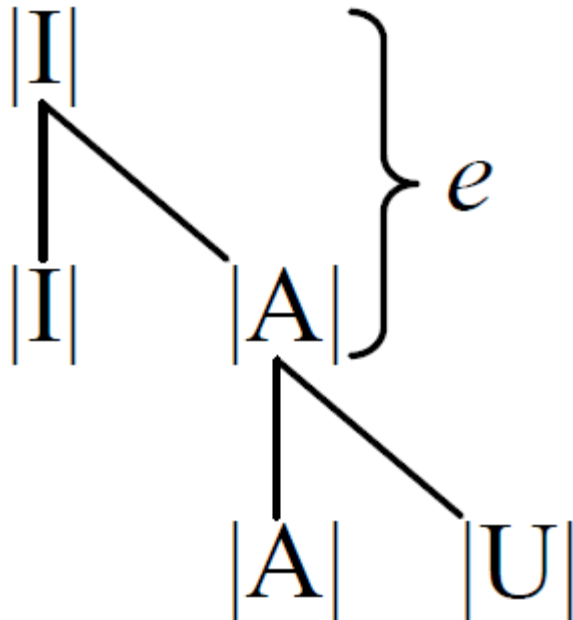
c. **wu*



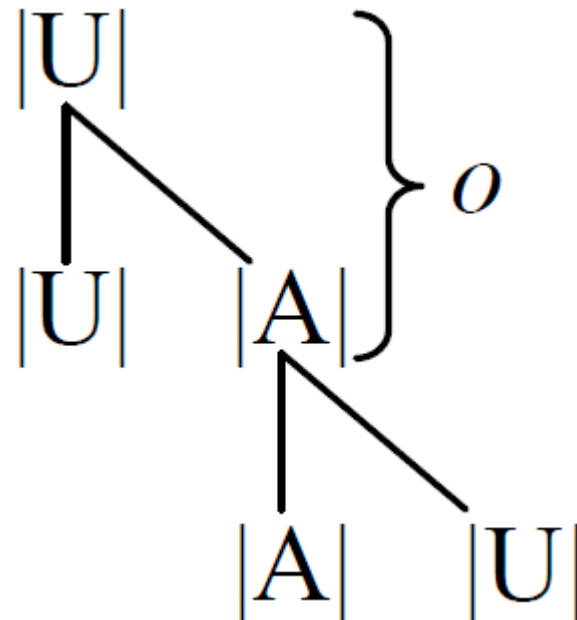
Representing *wV* in Japanese

(21)

d. **we*



e. **wo*



***|U| → |U|, *|| → |U|**

(22) a. ***|U| → |U|**

|U| cannot (in)directly license the same type of element (|U|) in a given domain. (**wu, *wo*)

b. ***|| → |U|**

|| cannot (in)directly license the element |U| in a given domain.

(**wi, *we*)

Given the proposed dependency-based structure for *jV* and *wV* in Japanese

- The language is phonologically viewed as a strict CV language.
- We no longer recognize that Japanese has five types of expression which can occupy nuclei. There must be nine types: five monophthongs (*a, i, u, e, o*) and four light diphthongs (*ja, ju, jo, wa*).

Loanwords

- In the present Japanese (among non-elder speakers), in fact, the katakana spellings of many foreign proper names suggest that sequences *je*, *wi*, *we*, *wo* are (at least phonetically) possible.
- However, the actual pronunciation of these sequences are uncertain and not consistent.

Conclusion

- Japanese has more than five vowels (*a, i, u, e, o*). Sequences such as *ja, ju, jo, wa* are also vowels (light diphthongs) rather than a sequence of CV.
- This analysis aligns with the prevalent analyses of other East-Asian languages such as Chinese and Korean where the same sequences are treated as light diphthongs rather than *j* plus a vowel.
- We may discard the notion of bare phonological positions (e.g. C/V units, Xs and Root node).
- Then, we may ultimately represent all structures by referring only to dependency.

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