

# A Comparison of Different Formal Approaches to the Phonology of the Pitch Accent in Japanese

Floris T. van Vugt<sup>1</sup>  
floris.van.vugt@ens.fr

June 8, 2008

---

<sup>1</sup>Research project supervised by Prof. Joaquim Brandão de Carvalho,  
Université Paris-8, jbrandao@ext.jussieu.fr

Say you're in a Japanese restaurant.

If you order *kaki*, depending on your intonation you will receive:

Say you're in a Japanese restaurant.

If you order *kaki*, depending on your intonation you will receive:



H L  
 | |  
 ka ki  
*Oyster*



# Research interest

## Main question

- Which formalism captures the essential information concerning tonal realisation in Tokyo Japanese?

# Research interest

## Main question

- Which formalism captures the essential information concerning tonal realisation in Tokyo Japanese?
  - *quantitative* (physical) vs.
  - *qualitative* (speaker's mental representation)

# Research interest

## Main question

- Which formalism captures the essential information concerning tonal realisation in Tokyo Japanese?
  - *quantitative* (physical) vs.
  - *qualitative* (speaker's mental representation)

H  
 |  
 ka ki  
 (H,  $\emptyset$ )  
 (stress language)

# Research interest

## Main question

- Which formalism captures the essential information concerning tonal realisation in Tokyo Japanese?
  - *quantitative* (physical) vs.
  - *qualitative* (speaker's mental representation)

H   ka ki <b>(H,∅)</b> (stress language)	H L     ka ki <b>(H,L)</b> (tone language)
--	--

# Research interest

## Main question

- Which formalism captures the essential information concerning tonal realisation in Tokyo Japanese?
  - *quantitative* (physical) vs.
  - *qualitative* (speaker's mental representation)

H

|

ka ki

**(H,∅)**

(stress language)

H L

| |

ka ki

**(H,L)**

(tone language)

HL

|

ka ki

**(HL,∅)**

# Tone language comparison

## Comparison with *tone* language

- Words can differ solely in their tonal realisation.

H L  
| |

ka ki

牡蠣

a. "oyster"

L H  
| |

ka ki

堵

b. "fence"

L H  
| |

ka ki

柿

c. "persimmon"

# Tone language comparison

## Comparison with *tone* language

- Words can differ solely in their tonal realisation.

H L

| |

ka ki

牡蠣

a. "oyster"

L H

| |

ka ki

堵

b. "fence"

L H

| |

ka ki

柿

c. "persimmon"

H L L

| | |

ka ki - ga

牡蠣が

L H L

| | |

ka ki - ga

堵が

L H H

| | |

ka ki - ga

柿が

# Tone language comparison

## Comparison with *tone* language

- Words can differ solely in their tonal realisation.
- But not all imaginable tonal patterns are found.

H L

| |

ka ki

牡蠣

a. "oyster"

L H

| |

ka ki

堵

b. "fence"

L H

| |

ka ki

柿

c. "persimmon"

H L L

| | |

ka ki - ga

牡蠣が

L H L

| | |

ka ki - ga

堵が

L H H

| | |

ka ki - ga

柿が

# Stress language comparison

n. tonal patterns  
of morae

---

2 HL, LH<sub>L</sub>, LH<sub>H</sub>

# Stress language comparison

n. tonal patterns  
of morae

---

2	HL,	LH <sub>L</sub> ,	LH <sub>H</sub>
3	HLL,	LHL,	LHH <sub>L</sub> , LHH <sub>H</sub>

# Stress language comparison

n. tonal patterns  
of morae

---

2	HL,	LH <sub>L</sub> ,	LH <sub>H</sub>		
3	HLL,	LHL,	LHH <sub>L</sub> ,	LHH <sub>H</sub>	
4	HLLL,	LHLL,	LHHL,	LHHH <sub>L</sub> ,	LHHH <sub>H</sub>

# Stress language comparison

n. tonal patterns  
of morae

---

2	HL,	LH <sub>L</sub> ,	LH <sub>H</sub>
3	HLL,	LHL,	LHH <sub>L</sub> , LHH <sub>H</sub>
4	HLLL,	LHLL,	LHHL, LHHH <sub>L</sub> , LHHH <sub>H</sub>

## Comparison with *stress* language

- A word has at most one **pitch drop** (HL) → "accent."

# Stress language comparison

n. tonal patterns  
of morae

---

2	HL,	LH <sub>L</sub> ,	LH <sub>H</sub>		
3	HLL,	LHL,	LHH <sub>L</sub> ,	LHH <sub>H</sub>	
4	HLLL,	LHLL,	LHHL,	LHHH <sub>L</sub> ,	LHHH <sub>H</sub>

## Comparison with *stress* language

- A word has at most one **pitch drop** (HL) → “accent.”
  - $n$  morae  $\Rightarrow n + 1$  tonal patterns

# Stress language comparison

n. tonal patterns  
of morae

---

2	HL,	LH <sub>L</sub> ,	LH <sub>H</sub>
3	HLL,	LHL,	LHH <sub>L</sub> , LHH <sub>H</sub>
4	HLLL,	LHLL,	LHHL, LHHH <sub>L</sub> , LHHH <sub>H</sub>

## Comparison with *stress* language

- A word has at most one **pitch drop** (HL) → “accent.”
  - $n$  morae  $\Rightarrow n + 1$  tonal patterns
- But it can also have **none**.

# Stress language comparison

n. tonal patterns  
of morae

---

2	HL,	LH <sub>L</sub> ,	LH <sub>H</sub>
3	HLL,	LHL,	LHH <sub>L</sub> , LHH <sub>H</sub>
4	HLLL,	LHLL,	LHHL, LHHH <sub>L</sub> , LHHH <sub>H</sub>

## Comparison with *stress* language

- A word has at most one **pitch drop** (HL) → “accent.”
  - $n$  morae  $\Rightarrow n + 1$  tonal patterns
- But it can also have **none**.
- **Accented** mora not necessarily distinguished.

# Outline of Haraguchi(1975)

## Haraguchi(1975)

- A word optionally has at most one mora that is lexically **marked** ("starred").

# Outline of Haraguchi(1975)

## Haraguchi(1975)

- A word optionally has at most one mora that is lexically **marked** ("starred").
- Observed tonal patterns follow from clearly definable rules.

# Outline of Haraguchi(1975)

## Haraguchi(1975)

- A word optionally has at most one mora that is lexically **marked** ("starred").
  - **(Non-)Starred** = (un-)accented.
- Observed tonal patterns follow from clearly definable rules.

# Outline of Haraguchi(1975)

## Haraguchi(1975)

- A word optionally has at most one mora that is lexically **marked** ("starred").
  - **(Non–)Starred** = (un–)accented.
  - *Only* information required to be in lexicon.
- Observed tonal patterns follow from clearly definable rules.

# Outline of Haraguchi(1975)

## Haraguchi(1975)

- A word optionally has at most one mora that is lexically **marked** ("starred").
  - **(Non-)Starred** = (un-)accented.
  - *Only* information required to be in lexicon.
- Observed tonal patterns follow from clearly definable rules.
  - HL-Association

# Outline of Haraguchi(1975)

## Haraguchi(1975)

- A word optionally has at most one mora that is lexically **marked** ("starred").
  - **(Non-)Starred** = (un-)accented.
  - *Only* information required to be in lexicon.
- Observed tonal patterns follow from clearly definable rules.
  - HL-Association
    - Every word is assigned HL

# Outline of Haraguchi(1975)

## Haraguchi(1975)

- A word optionally has at most one mora that is lexically **marked** ("starred").
  - **(Non-)Starred** = (un-)accented.
  - *Only* information required to be in lexicon.
- Observed tonal patterns follow from clearly definable rules.
  - HL-Association
    - Every word is assigned HL
  - Universal Tone Association Conventions

# Outline of Haraguchi(1975)

## Haraguchi(1975)

- A word optionally has at most one mora that is lexically **marked** (“starred”).
  - **(Non–)Starred** = (un–)accented.
  - *Only* information required to be in lexicon.
- Observed tonal patterns follow from clearly definable rules.
  - HL-Association
    - Every word is assigned HL
  - Universal Tone Association Conventions
    - Every tone is assigned to a mora.
    - Every mora is assigned to a tone.

# Example derivations

Underlying ka\*ki | kaki\* | ka ki

# Example derivations

Underlying	ka*ki	kaki*	ka ki
	H L	H L	H L
HLA	ka*ki	kaki*	ka ki

# Example derivations

Underlying	ka*ki	kaki*	ka ki
	H L 	H L 	H L 
HLA	ka*ki	kaki*	ka ki
	H L 	H L / \	H L / \
U(a,b,c)	ka*ki	kaki*	ka ki

# Example derivations

Underlying	ka*ki	kaki*	ka ki
	H L 	H L 	H L 
HLA	ka*ki	kaki*	ka ki
	H L 	H L / \	H L / \
U(a,b,c)	ka*ki	kaki*	ka ki
	H L 	L H 	L H 
Surface	ka ki	ka ki	ka ki

# Is HL the basic melody?

- Star → HL melody observed

# Is HL the basic melody?

- Star → HL melody observed
- No star → H melody observed

# Is HL the basic melody?

- Star → HL melody observed
- No star → H melody observed

Why assign HL to all words?

# Is HL the basic melody?

- Star → HL melody observed
- No star → H melody observed

## Why assign HL to all words?

- Haraguchi: more theoretical entities

# Is HL the basic melody?

- Star → HL melody observed
- No star → H melody observed

## Why assign HL to all words?

- Haraguchi: more theoretical entities
  - H and HL melodies vs. HL only

# Is HL the basic melody?

- Star → HL melody observed
- No star → H melody observed

## Why assign HL to all words?

- Haraguchi: more theoretical entities
  - H and HL melodies vs. HL only
  - Selection rule vs. none

# Is HL the basic melody?

- Star → HL melody observed
- No star → H melody observed

## Why assign HL to all words?

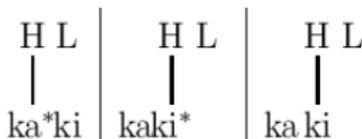
- Haraguchi: more theoretical entities
  - H and HL melodies vs. HL only
  - Selection rule vs. none
- Critique:
  - Only saying HL more informative.

# Is HL the basic melody?

- Star → HL melody observed
- No star → H melody observed

## Why assign HL to all words?

- Haraguchi: more theoretical entities
  - H and HL melodies vs. HL only
  - Selection rule vs. none
- Critique:
  - Only saying HL more informative.
  - $n + 1$  accentual patterns but  $n$  assignments

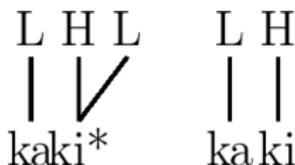
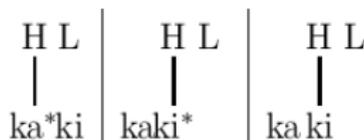


# Is HL the basic melody?

- Star → HL melody observed
- No star → H melody observed

## Why assign HL to all words?

- Haraguchi: more theoretical entities
  - H and HL melodies vs. HL only
  - Selection rule vs. none
- Critique:
  - Only saying HL more informative.
  - $n + 1$  accentual patterns but  $n$  assignments
  - Word-final contour tones, for which Haraguchi can only account by artificially putting it back in.



# Conclusion

## Overview

- $(H, \emptyset)$ : certain stress features

# Conclusion

## Overview

- $(H, \emptyset)$ : certain stress features
- $(H, L)$ : certain tone features

# Conclusion

## Overview

- $(H, \emptyset)$ : certain stress features
- $(H, L)$ : certain tone features
- $(HL, \emptyset)$ :

# Conclusion

## Overview

- $(H, \emptyset)$ : certain stress features
- $(H, L)$ : certain tone features
- $(HL, \emptyset)$ :
  - Haraguchi: tonal information reduced to lexical "star"

# Conclusion

## Overview

- $(H, \emptyset)$ : certain stress features
- $(H, L)$ : certain tone features
- $(HL, \emptyset)$ :
  - Haraguchi: tonal information reduced to lexical "star"
  - HL as *basic melody*

# Conclusion

## Overview

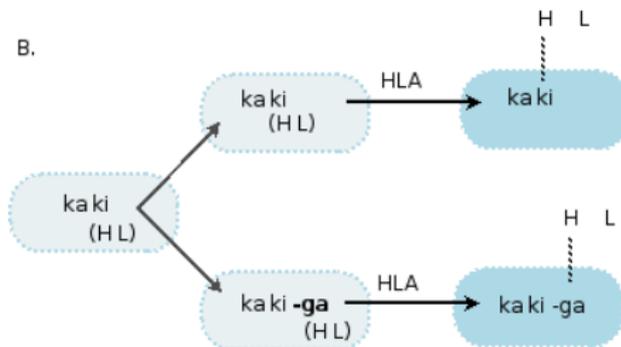
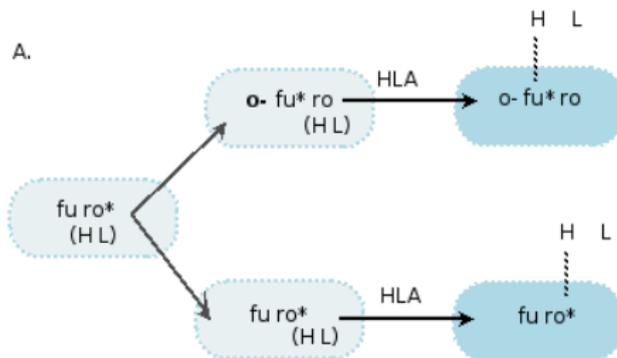
- $(H, \emptyset)$ : certain stress features
- $(H, L)$ : certain tone features
- $(HL, \emptyset)$ :
  - Haraguchi: tonal information reduced to lexical "star"
  - HL as *basic melody*

## Pertinence

- Understanding phonological faculty concerning tonality: what do speakers of any language have in their heads?

## Grazie per l'attenzione

- *Se non è sul web, non esiste.*
- Therefore, you can find the paper online:
  - google "Floris van Vugt", or
  - <http://vanvugt.cjb.net/>



	1.a	1.b	1.e	1.c	1.f
Underlying	ka*ki	kaki*	kaki*ga	ka ki	ka ki-ga
HLA	$\begin{array}{c} \text{H L} \\   \\ \text{ka}^* \text{ki} \end{array}$	$\begin{array}{c} \text{H L} \\   \\ \text{kaki}^* \end{array}$	$\begin{array}{c} \text{H L} \\   \\ \text{kaki}^* \text{-ga} \end{array}$	$\begin{array}{c} \text{H L} \\   \\ \text{ka ki} \end{array}$	$\begin{array}{c} \text{H L} \\   \\ \text{ka ki-ga} \end{array}$
U(a,b,c)	$\begin{array}{c} \text{H L} \\   \quad   \\ \text{ka}^* \text{ki} \end{array}$	$\begin{array}{c} \text{H L} \\ \diagdown \quad \diagup \\ \text{kaki}^* \end{array}$	$\begin{array}{c} \text{H L} \\ \diagup \quad   \\ \text{kaki}^* \text{-ga} \end{array}$	$\begin{array}{c} \text{H L} \\ \diagdown \quad \diagup \\ \text{ka ki} \end{array}$	$\begin{array}{c} \text{H L} \\ \diagdown \quad \diagup \quad \diagup \\ \text{ka ki-ga} \end{array}$
IL	—	$\begin{array}{c} \text{L H L} \\   \quad   \quad \diagup \\ \text{kaki}^* \end{array}$	$\begin{array}{c} \text{L H L} \\   \quad   \quad   \\ \text{kaki}^* \text{-ga} \end{array}$	$\begin{array}{c} \text{L H L} \\   \quad   \quad \diagup \\ \text{ka ki} \end{array}$	$\begin{array}{c} \text{L H L} \\   \quad \diagdown \quad \diagup \\ \text{ka ki-ga} \end{array}$
TS	—	$\begin{array}{c} \text{L H} \\   \quad   \\ \text{kaki}^* \end{array}$	—	$\begin{array}{c} \text{L H} \\   \quad   \\ \text{ka ki} \end{array}$	$\begin{array}{c} \text{L H} \\   \quad \diagup \\ \text{ka ki-ga} \end{array}$
Surface	$\begin{array}{c} \text{H L} \\   \quad   \\ \text{ka ki} \end{array}$	$\begin{array}{c} \text{L H} \\   \quad   \\ \text{ka ki} \end{array}$	$\begin{array}{c} \text{L H L} \\   \quad   \quad   \\ \text{ka ki-ga} \end{array}$	$\begin{array}{c} \text{L H} \\   \quad   \\ \text{ka ki} \end{array}$	$\begin{array}{c} \text{L H} \\   \quad \diagup \\ \text{ka ki-ga} \end{array}$

HL  
⋮  
HLA. # Q V

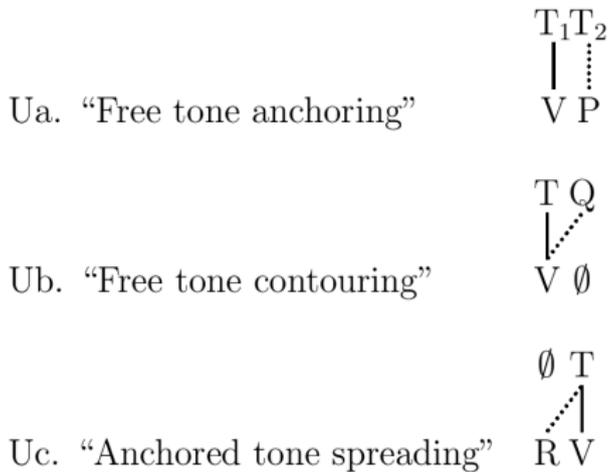


Table 6: Tone Simplification

TS. Original  $L \rightarrow \emptyset / \overset{\text{H}}{\underset{\text{V}}{\downarrow}} \text{ } \_$

Adapted  $L \rightarrow \emptyset / \overset{\text{H}}{\underset{\text{V}^-}{\downarrow}} \text{ } \_$

Table 5: Initial Lowering

