

Towards intonational typology of Japanese dialects

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Overview

- Phrase-level prosody, or *intonation* is now a central concern in studies on phonetics and phonology (Ladd 1996, Gussenhoven 2004)
- Since the emergence of Pierrehumbert's dissertation on English intonation (1980), intonation of world languages has been described in comparative terms, and the findings have contributed to developing the theory of intonation (Jun 2005)
- Japanese language has played a leading role in the understanding of intonation (Pierrehumbert and Beckman 1988)
- This presentation concerns my research project on intonation of **Japanese dialects**

Overview

- *Towards intonational typology of Japanese dialects*

Part I

- About my research project
 - My approach to the intonation of Japanese prosody
 - How does this approach differ from the past ones?
 - What contributions will this approach yield?

Review of past studies, including my own

Part II

- Experimental results on Goshogawara dialects (Aomori Prefecture)
 - It shows that the present approach contributes to more adequate description of the prosodic system of a specific dialect

1. Intonational typology of Japanese dialects

➔ 1.1 Approach

1.2 Advantages of the present approach

1.3 Summary

2. The prosodic structure of Goshogawara

2.1 Introduction

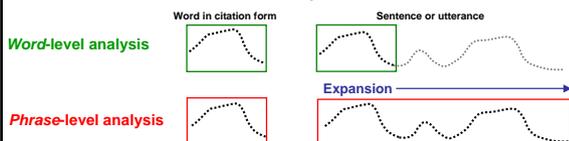
2.2 Experiment

2.3 Explanation of findings

3. Conclusion

Expansion of "analysis window"

- Examination of *phrase-level prosody* (intonation)
 - Unlike word-level prosody, the examination of phrase-level prosody requires the expansion of the "**analysis window**" **word-size** window → **phrase-size** window



- The **domain** of prosodic phenomena to be analyzed is extended from (prosodic) **word** to (prosodic) **phrase**
- **Derivationally**, the primary concern is shifted from **lexical** tones to **post-lexical** tones

Prosody of Japanese dialects

- Examination of prosody of Japanese dialects
 - Japanese dialects present a rich variety of prosodic systems
 - Prosodic system of one dialect differs considerably from other dialects, as if "they were different languages" (Sugito 2001)
 - Description of the prosodic system of Japanese dialect has been a central issue in Japanese phonetics/ phonology
 - The study has a long tradition with tremendous amount of literature
 - However, the researchers' primary concern has been **word-level** prosody, not **phrase-level** prosody

Word level prosody vs. phrase-level prosody

- Existing prosodic classifications of Japanese dialects
 - Kindaichi (1964)**
 - Motivated by an interest in historical development of word-level prosody
 - Hirayama (1960)**
 - Approach similar to Kindaichi (1964)
 - Uwano (1989, 1998)**
 - A purely synchronic classification of prosodic systems
 - Hayata (1999)**
 - An unique classification of prosodic systems which is argued to be correlated with prosodic rules of compound words
 - etc...
- See Shibatani (1990, chap. 9 for review written in English)

...All the above are classifications of **word-level prosody**

Word level prosody vs. phrase-level prosody

- Rough classification of dialectal prosodic systems
 - Accented dialects** (*yu-akusento*)
 - Dialects **with lexically specified tones**
 - e.g. Tokyo, Osaka, Kyoto, Nagoya, Fukuoka, Hirosaki, Goshogawara, Kagoshima, etc.
 - Fixed accent dialects**
 - or "one-pattern accent" (*ikkei-akusento*)
 - Dialects **without lexically specified tones**
 - The pitch pattern for prosodic word is **fixed**
 - e.g. Miyakonojo, Kobayashi, Nichinan, etc.
 - Accentless dialects** (*mu-akusento*)
 - or "pattern-less" dialect (*mukei-akusento*)
 - Dialects **without lexically specified tones**
 - The pitch pattern for prosodic word is **not fixed**
 - e.g. Sendai, Koriyama, Utsunomiya, Tochigi, Fukui, Kumamoto, Omuta etc.

Word level prosody vs. phrase-level prosody

- Existing prosodic classifications are based on **word-level prosody**
 - Uwano (1984) may be the single exception
 - An attempt to classify phrase-level prosody of *ca* 20 dialects
 - A pioneering work of intonational typology of Japanese dialects
 - But there have been no successive works exactly along this line of research
- Phrase-level prosody has been underestimated**
 - Phrase-level prosody (intonation) seems to have been treated as a sort of "noise", which obscures the nature of word-level prosody

Word level prosody vs. phrase-level prosody

- What advantages does the present approach has?
 - Study on phrase-level prosody (intonation) of Japanese dialects will make it possible...
 - to treat **accentless dialects** in the same framework as the accented dialects
 - to **re-examine word-level prosody** in a phrasal perspective
 - to examine the nature of the relationship between **prosody and syntax**

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Accentless and accented dialects in a unified framework

- The accentless dialects – "the ignored dialects"

From Akinaga ed. (2002: pp. 1)

Accentless dialects



The accented dialects are classified into many subgroups, while the accentless dialects are clumped into a single group ...as if researchers lost their interest in the accentless dialects, only because they do not have lexical tones

Questions arise:

- Is there any prosodic **difference** within the accentless dialects?
- Is there any **similarity** between the accentless and accented dialects?

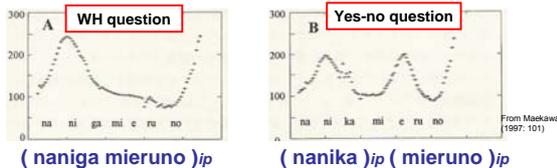
Accentless and accented dialects in a unified framework

- Similarities between the accentless dialects and the accented dialects

e.g. Wh question vs. Yes-no question

- Wh question is merged into a single intonational phrase, while yes-no question is divided into two intonational phrases (cf. Maekawa 1994)

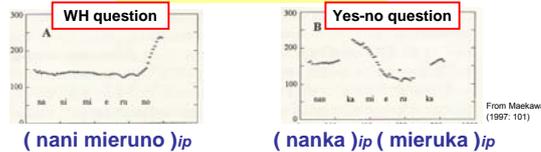
Tokyo (Accented dialect)



Accentless and accented dialects in a unified framework

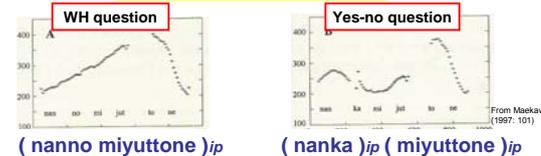
Fukui (Accentless dialect)

Maekawa (1997)



Kumamoto (Accentless dialect)

Maekawa (1997)



Word-level prosody in phrasal perspectives

- The examination of phrase-level prosody
 - leads us to re-examine *word*-level prosody
 - leads us to more adequate description of word-level prosody
 - contributes to the development of prosodic theory in general

Bruce (1977): “Phrase accent” in Stockholm Swedish

Kawakami (1957): “Phrase tone” (phrase-initial rise) in Tokyo Japanese

Word-level prosody in phrasal perspectives

- Initial rise in Tokyo
 - Word in citation form shows a pitch rise from the first mora to the second
 - Initial rise does not function as a lexical distinction
 - Initial rise can disappear when a word occurs sentence-medially
 - It has long been taken as a property of *words*
 - “Quasi-accent” (*jun’akusento*) (Jinbo 1925)
 - “Non-distinctive feature of word accent” (Hattori 1954)
- Kawakami’s proposal (1957)
 - Initial rise is not a property of the word, but a property of the *phrase*
 - Initial rise marks the beginning of the phrase
 - Occurrence of the initial rise depends on *phrasing* of an utterance

Word-level prosody in phrasal perspectives

- Contributions of Kawakami (1957)
 - Introduction of a notion of phrase (prosodic unit larger than a prosodic word)
 - Introduction of a notion of tone, whose domain is the phrase
 - Demonstration that phrase-level tones (intonational tones) can be subject to linguistic investigations
 - ‘Dawn’ of intonational phonology (cf. Ladd 1996) in Japan....
- Theoretical development after Kawakami
 - A notion of phrase-initial rise is adopted to Pierrehumbert and Beckman’s model for Tokyo Japanese (1988)
 - Pierrehumbert and Beckman’s model plays leading role in developing intonational phonology of world languages (see Ladd 1996, Gussenhoven 2004, Jun 2005)

Word-level prosody in phrasal perspectives

- Expected contributions from Japanese *dialects*
 - Phrase-level prosody of Japanese *dialects* has not been fully examined
 - cf. Uwano (1984)
 - The investigations of Japanese dialects (with rich prosodic varieties) will shed light on research of prosody in general

So far, we have seen a situation where the tone which has been taken as a property of the *word* turned out to be a property of the *phrase*

Can the opposite be true?

Yes, it can.

The tone which has been taken as a property of the *phrase* can actually be a property of the *word*

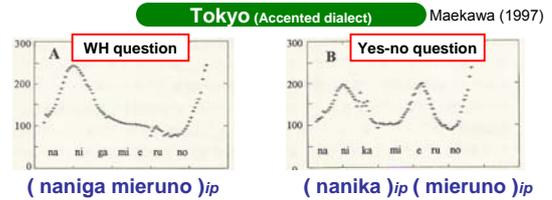
In Part II, we will see the concrete case in the analysis of Goshogawara dialect

The nature of the relationship between prosody and syntax

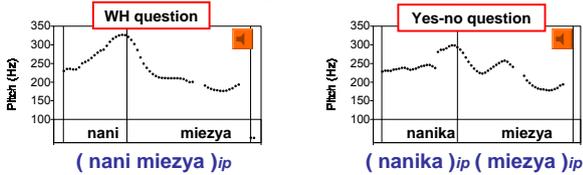
- Prosody-syntax interface
 - Primary motivation for work on phrase-level prosody
 - A central topic of this workshop
- Advantages in the investigation of *Japanese dialects*
 - Their rich varieties in prosody
 - We can observe a variety of prosodic phenomena brought about by syntactic factors
 - Analyses of Japanese dialects should have as much value as of other languages
 - Their uniformity in syntax
 - It is easy to design test sentences with 'identical' syntactic structure for the sake of comparison
 - It is easy to identify syntactic factors causing prosodic differences than to compare between different languages

The nature of the relationship between prosody and syntax

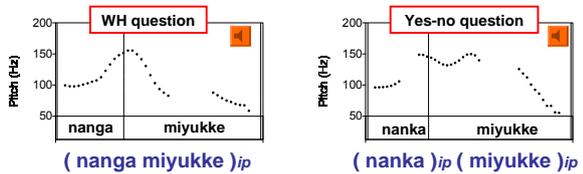
- Similarities in prosody-syntax mapping among Japanese dialects
 - (1) Wh question vs. Yes-no question
 - Wh question is merged into a single intonational phrase, while yes-no question is divided into two intonational phrases (cf. Maekawa 1994)



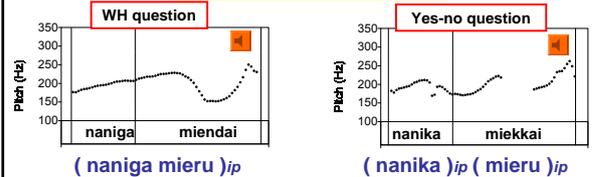
Goshogawara (Accented dialect) Igarashi (2006a)



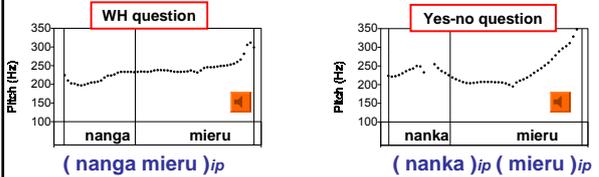
Kobayashi (Fixed accent dialect) Igarashi (2006b)



Koriyama (Accentless dialect) Igarashi (ms)



Omuta (Accentless dialect) Igarashi (ms)



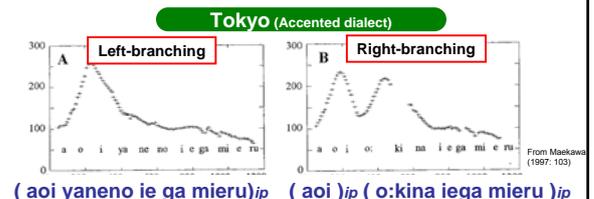
The nature of the relationship between prosody and syntax

- A distinction between wh- and yes-no questions

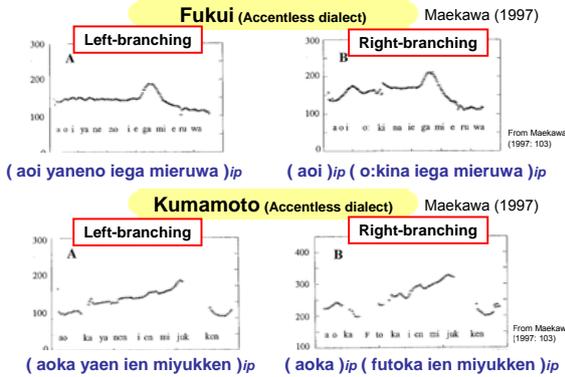
| | | | |
|----------------------|-------------|-----|--------------------------------------|
| Accented dialects | Tokyo | yes | P&B (1989) |
| | Osaka | yes | Kori (1989) |
| | Kagoshima | yes | Kori (2006a) |
| | Hirosaki | yes | Kori (2006a) |
| | Goshogawara | yes | Igarashi (2006a) |
| Fixed accent dialect | Fukuoka | yes | Hayata (1985) Kubo (1989) |
| | Koyabashi | yes | Igarashi (2006b) |
| Accentless dialects | Fukui | yes | Maekawa (1990, 1997) |
| | Kumamoto | yes | Maekawa (1990, 1997) Kori (2006b) |
| | Fukushima | yes | Igarashi (ms) |
| | Omuta | yes | Igarashi (ms) |

The nature of the relationship between prosody and syntax

- Similarities in prosody-syntax mapping among Japanese dialects
 - (2) Left-branching vs. Right-branching
 - “Branching Constraint”: Right-branching syntactic boundary introduces pitch range expansion (metrical boost) (Kubozono 1988, 1997)



The nature of the relationship between prosody and syntax



The nature of the relationship between prosody and syntax

- Branching Constraint in Japanese dialects
 - There can be dialect-specific difference

| | | | |
|----------------------|-------------|-------------|---|
| Accented dialects | Tokyo | yes | P&B (1989) |
| | Hirosaki | yes | Kori (2006a) |
| | Goshogawara | yes | Igarashi (2006a) |
| Fixed accent dialect | Osaka | yes/ no | Kori (1989) – yes Sugino (2001) – no |
| | Koyabashi | yes/ no? | Sato (2006) – yes Igarashi (2006b) – no? |
| Accentless dialects | Fukuji | yes | Maekawa (1990, 1997) |
| | Kumamoto | yes | Maekawa (1990, 1997) Kori (2006b) |
| | Fukushima | yes | Igarashi (ms) |
| | Omuta | yes | Igarashi (ms) |
| | Ibaraki | no? | |
| | Utsunomiya | no? | My pilot studies |

The nature of the relationship between prosody and syntax

- Dialect-specific difference in Prosody-syntax interface
 - Difference in prosody-syntax mapping rules
 - In Fukuoka lexical tones are deleted in wh question (Hayata 1985, Kubo 1989), while in Tokyo deletion does not occur (Maekawa 1994)
 - Presence or absence of a certain mapping rule
 - Controversial results for the presence of branching constraint in Osaka (Kori 1989, Sugito 2001) and Kobayashi (Sato 2006, Igarashi 2006b)
 - Some of the accentless dialects (North Kanto dialects?) might lack branching constraint (my pilot studies)

The nature of the relationship between prosody and syntax

- Why do some of the dialects have a certain mapping rule, while others do not?
 - The absence of a certain mapping rule might be related to dialect-specific difference in **prosodic structure**
 - There might be correlation between prosodic structure and the presence or absence of mapping rules
 - Those dialects which share the same mapping rules might share the same prosodic features
 - “Implicational universal” ?
 - If a dialect has a prosodic feature X, then it does not have a mapping rule Y
 - If a dialect does not have a prosodic feature X, then it has a mapping rule Y

1. Intonational typology of Japanese dialects

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1.2 Advantages of the present approach

➔ 1.3 Summary

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Summary

- The present research project concerns phrase-level prosody (intonation) of Japanese dialects
- While there is a vast number of literature about word-level prosody in Japanese dialects, phrase-level prosody has not been a central concern in Japanese linguistics
- By expanding the analysis window the primary focus of the research shifts from word-level prosody to phrase-level prosody
- The examination of phrase-level prosody makes it possible to capture similarities and differences across boundaries of the past classification based on word-level prosody
- The present approach will contribute to
 - more adequate description of a specific dialect
 - the development of theory of prosody in general
 - the understanding of prosody-syntax interface

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Introduction

• Overview

- In Part I, it was claimed that the examination of phrase-level prosody leads us to more adequate description of word-level prosody
- In Part II, we will see concrete examples in the analysis of a specific dialect, Goshogawara dialect (Aomori pref.)

Goshogawara



It will be shown that...

- The tone that has been claimed to be a property of the *phrase* is actually a property of the *word*
- The lexical pitch accent that has been claimed to be *LH* (rising) is actually *HL*

Introduction

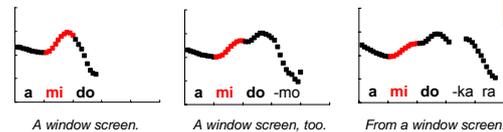
• Goshogawara Japanese

- An accented dialect
- Words can be either **accented** or **unaccented**
 - The **accented words** have a syllable that is lexically specified as accented
 - The **unaccented words** have no syllable that is lexically specified as accented
- The prosodic system is similar to Hirosaki Japanese (described in Uwano 1977)
 - **Rising pitch accent** (or 'ascending kernel')
 - **Pitch pattern alternation**

Rising pitch accent & pitch pattern alternation

• Rising pitch accent

- Falling pitch accent
 - The accented syllable or mora exhibits *pitch fall*
 - Tokyo, Osaka and many other dialects
- **Rising pitch accent**
 - The accented syllable or mora exhibits *pitch rise*
 - Hirosaki (Uwano 1977), Shizukuishi (Uwano 1977, 1992), Rikuchu-Miyako (Tanaka 2003)

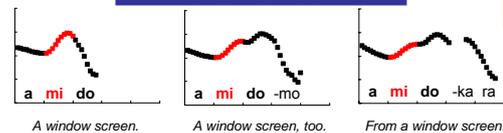


Rising pitch accent & pitch pattern alternation

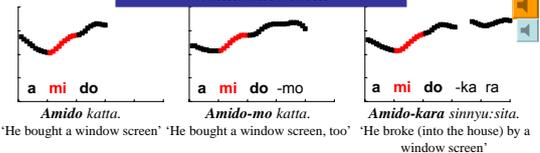
• Pitch pattern alternation

- **Accented words** show two types of pitch patterns (Uwano 1977)
 - **Non-connective form**
 - The form which occurs when the word is pronounced *with* juncture
 - The pitch pattern *with* the final fall
 - **Connective form**
 - The form which occurs when the word is pronounced *without* juncture
 - The pitch pattern *without* the final fall
- **Unaccented words** do not exhibit alternation

Non-connective form



Connective form

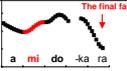


'He bought a window screen' 'He bought a window screen, too' 'He broke (into the house) by a window screen'

Unaccented words



Question



• Is the final fall a property of *word* or *phrase*?

Phrasal fall hypothesis

“The final fall is a property of the phrase.” (Uwano 1998 for Shizukuishi)

Prediction regarding the pitch of the following word

There should be **no pitch difference** regardless of whether the preceding word is **accented** or **unaccented**

Accentual fall hypothesis

“The final fall is a property of the accented word.” (Hattori 1979 for Hirosaki)

Prediction regarding the pitch of the following word

There should be **a certain pitch difference** depending on whether the preceding word is **accented** or **unaccented**

The accented words should exhibit a ‘falling’ property even if there is no actual fall in the word-final syllable (connective form)

The ‘falling’ property of an accented word (which is not manifested as the final fall) should lend certain effects on the following words

Question

• Possible pitch differences of the following word

(1) Downstep

– The ‘falling’ property of the **accented words** is expected to be realized as **pitch range compression effects** on the following words



– No systematic investigation has so far been made regarding downstep

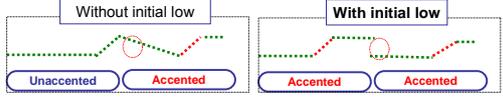
- Descriptions, suggestive of downstep in Hirosaki can be found in Uwano (1977)
- The existence of downstep is considered as support for the Accentual Fall Hypothesis by Hattori (1979)

Question

• Possible pitch differences of the following word

(2) Initial lowering

– The ‘falling’ property of the **accented words** is expected to be realized as the **low pitch** at the beginning the following words



– No studies have reported pitch difference in the beginning of the following word

– According to Uwano (1977, 1980, 1992), words (both **accented** and **unaccented**) *always* exhibit the initial lowering in Hirosaki and Shizukuishi

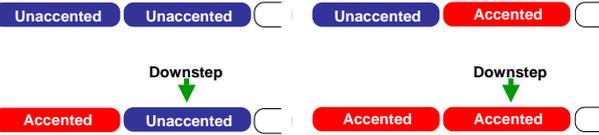
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Methods

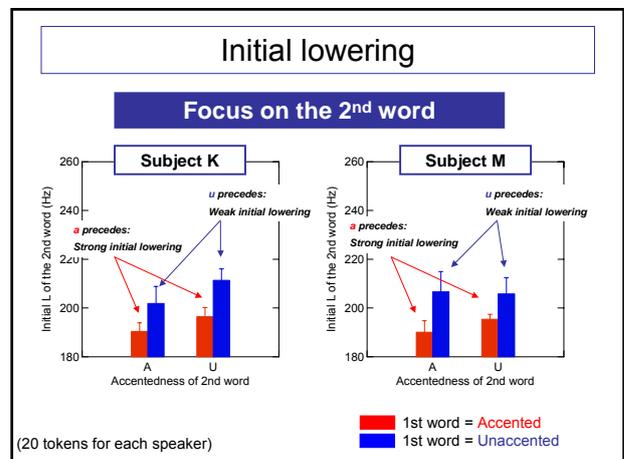
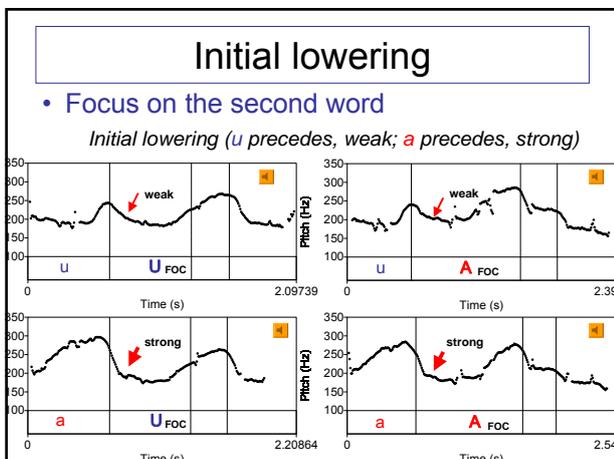
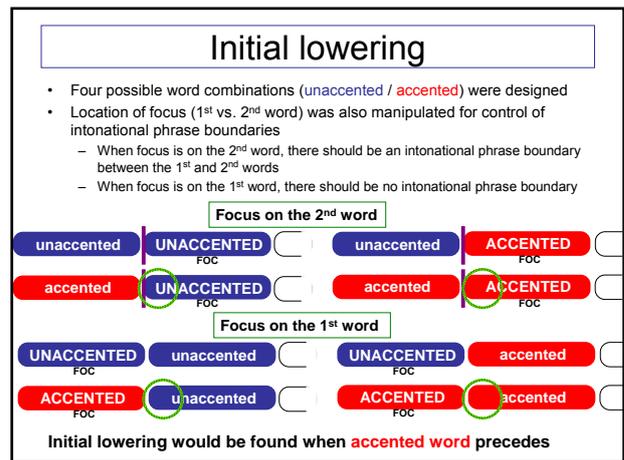
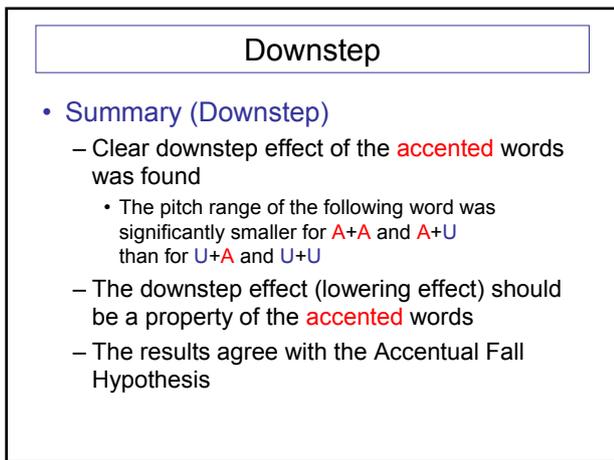
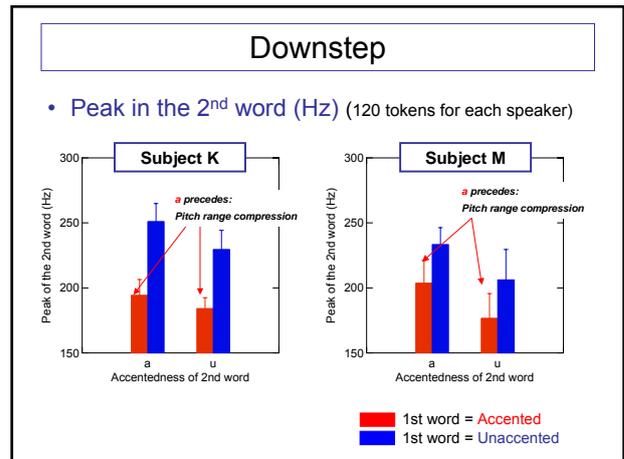
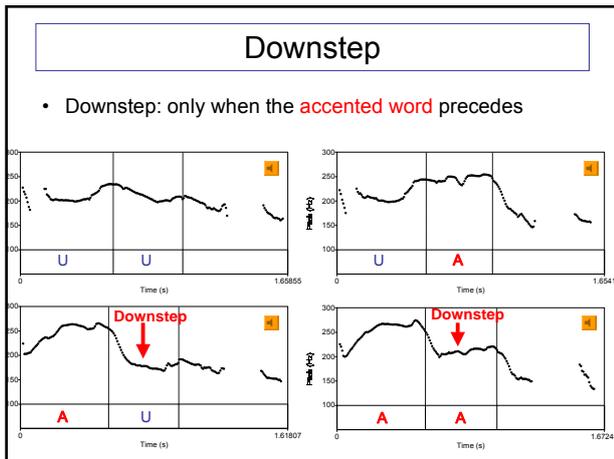
- **Aim**
 - To investigate whether the final fall of the accented words in non-connective form is a property of the *phrase* or a property of the *word*
- **Subjects**
 - Two 21-year old female native speakers of Goshogawara
- **Recordings**
 - Marantz PMD660, 48kHz, 16bit
- **Analysis procedures**
 - Subjects are asked to translate test sentence written in standard Japanese into Goshogawara
 - Subjects are asked to read aloud the translated sentences five times
 - F0 was extracted using the Praat software

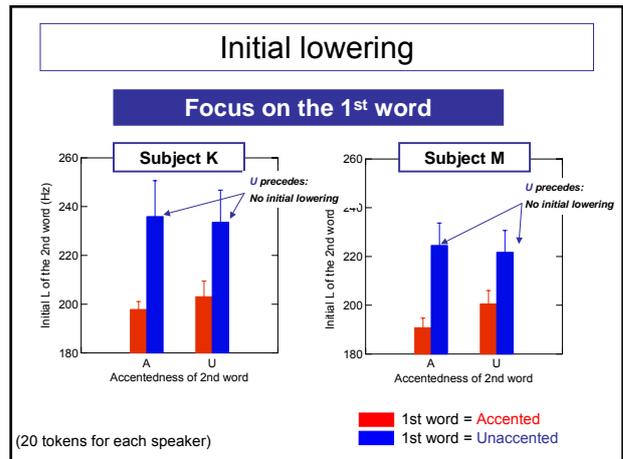
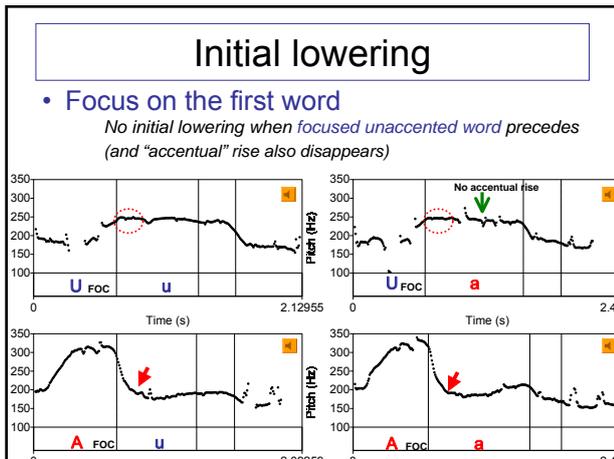
Downstep

• Four possible word combinations (**unaccented** / **accented**) were designed



Downstep should occur only when the **accented word precedes**





Initial lowering

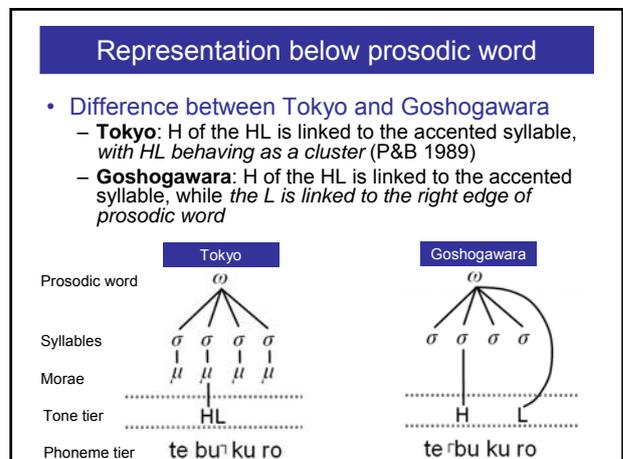
- Summary (Initial lowering)
 - Accentedness (A or U) affected the initial lowering
 - With focus on the following (2nd) word: degree of the initial lowering was smaller when the preceding word was unaccented than when the preceding word was accented
 - With focus on the preceding (1st) word: the initial lowering disappeared, when the preceding word was unaccented (and "accentual" rise also disappeared)
 - The (strong) initial lowering can be regarded as property of the preceding accented word
 - The weak initial lowering should be a property of the intonational phrase, introduced by focus
 - The results favor the Accentual Fall Hypothesis

- Intonational typology of Japanese dialects
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Representation of pitch accent

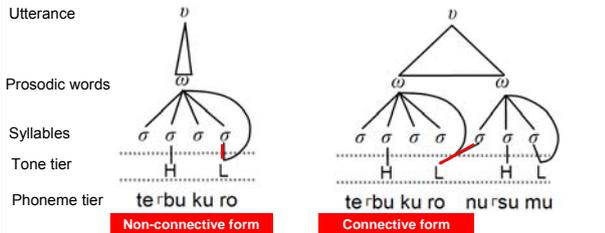
- The lexical pitch accent in Goshogawara always shows 'falling' property
 - In non-connective form
 - Fall in the finally syllable
 - In connective form
 - Downstep effect on the following word
 - Initial lowering of the following word
- 'Rising' property can disappear depending on phrasing of utterance
 - When the focused unaccented word precedes, "accentual" rise can disappear
- Representation of the pitch accent should not be LH (rising), but HL (falling), just as Tokyo

| | | |
|------------------|-----------|-----------------|
| Previous account | Tokyo: HL | Goshogawara: LH |
| Proposed account | Tokyo: HL | Goshogawara: HL |



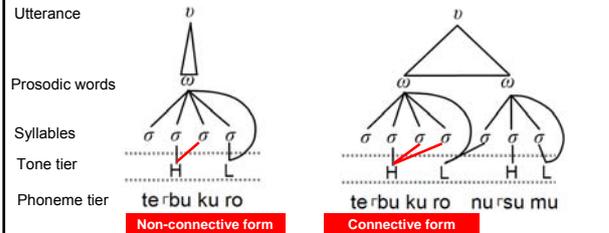
Pitch pattern alternation

- Secondary association rule
 - If the prosodic word is utterance-final, link L to its final syllable [=the final fall]
 - If the prosodic word is not utterance-final, link L to the first syllable of the following prosodic word [=Initial lowering]



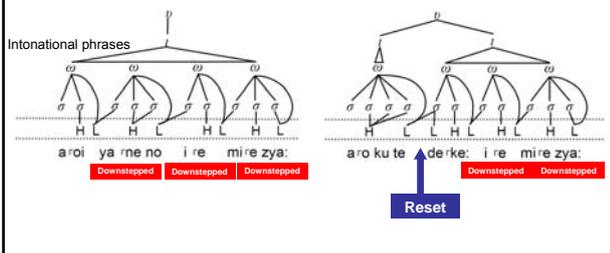
Pitch pattern alternation

- H tone spreading rule
 - Spread H from left to right over tonally unspecified syllables



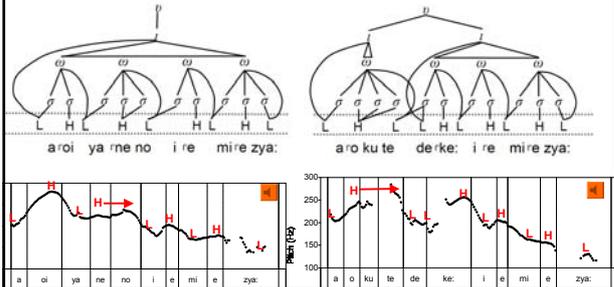
Downstep

- Downstep
 - An accentual HL tonal sequence compresses pitch range of the prosodic words within the same intonational phrase



Downstep

- Intonational phrase
 - The domain for pitch range (domain of downstep)
 - It has L at its left edge, which is linked to the first syllable of the first prosodic word in the intonational phrase



1. Intonational typology of Japanese dialects

- 1.1 Approach
- 1.2 Advantages of the present approach
- 1.3 Summary

2. The prosodic structure of Goshogawara

- 2.1 Introduction
- 2.2 Experiment
- 2.3 Explanation of findings

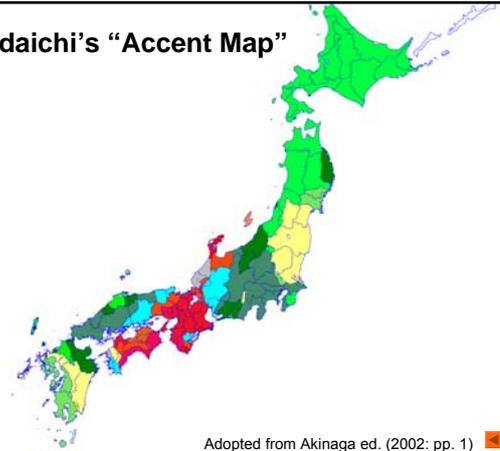
➔ 3. Conclusion

3. Conclusion

- This presentation is a glimpse of my research on phrase-level prosody, or intonation of Japanese dialects
- Intonation of Japanese dialects have not been fully investigated
- Since prosody of Japanese dialects exhibit rich variety, its examination should play important role in the understanding of intonation in general
- It was shown that studies on intonation of Japanese dialect will contribute to more adequate description of a specific dialect, to the development of theory of prosody in general, and to the understanding of prosody-syntax interface

Konec

Kindaichi's "Accent Map"



Adopted from Akinaga ed. (2002: pp. 1)

Reference

- Akinaga, Kazue ed. (2002) *Shinmeikai Nihongo Akusento Jiten*. Tokyo: Sanseido.
- Gussenhoven, Carlos (2004) *The Phonology of Tone and Intonation*. Cambridge: Cambridge University Press.
- Hattori, Shiro (1954) On'inron kara mi ta kokugo no akusento. *Kokugogaku Kenkyu*, 2.
- Hattori, Shiro (1979) Hyoso akusentosoto to kitei akusentosoto. S. Hattori and R. Jakobson (eds.) *Science of Language* 7, 71-96.
- Hayata, Teruhiro (1985) *Hakata Hogen no Akusento Keitairon*. Fukuoka: Kyushu University Press.
- Hayata, Teruhiro (1999) *Oncho no Taiporajii*. Tokyo: Taishukan.
- Hirayama, Teruo ed. (1960) *Zenkoku Akusento Jiten*. Tokyo: Tokyodo.
- Igarashi, Yosuke (2006a) A preliminary analysis of the relation between lexical pitch accent and prosodic phrasing in Goshogawara Japanese. *Proceedings of the 20th General Meeting of the Phonetic Society of Japan*, 141-146.
- Igarashi, Yosuke (2006b) Dephrasing in Kobayashi Japanese: Is it a reality?. *Proceedings of the 126th conference of the Linguistic Society of Japan*, 53-58.
- Igarashi, Yosuke (2006c) 'Rising' pitch accent of Goshogawara Japanese? The 1st SLIL Seminar on Phonetics. (Nov. 24 at Korea University, Seoul, Korea.)

Reference

- Igarashi, Yosuke (ms.) Modeling of degree of freedom of pitch patterns in Japanese accentless dialects (tentative title; unpublished manuscript)
- Jinbo, Kaku (1925) *Kokugo Onseigaku*. Tokyo: Meiji Toshosha.
- Kawakami, Shin (1957) Jun'akusento ni tsui te. *Kokugokenkyuu* 7: reprinted in S. Kawakami (1995) *Nihongo Akusento Ronshu*, pp. 92-113, Kyuko Shoin.
- Kindaichi (1964) Watashi no hogen kukaku. In M. Tojo (ed.) *Nihon no Hogen Kukaku*. Tokyo: Tokyodo.
- Kori, Shiro (1987) The tonal behavior of Osaka Japanese: an interim report. *OSU Working Papers in Linguistics* 36, 31-61.
- Kori, Shiro (1989) Hatsuwa no oncho o kitei suru yoin: nihongo intoneeshonron. *Yoshizawa Norio Kyoju Tsuito Ronbunshu*, pp. 116-127.
- Kori, Shiro (1997) Nihongo no intoneeshon -kata to kino-. M. Kunihiro et al. (eds.) *Nihongo Onsei 2: Akusento Intoneeshon Rizumu to Poozu*, pp. 169-202. Tokyo: Sanseido.
- Kori, Shiro (2004) Tokyo akusento no tokucho saiko. *Kokugogaku* 55:2, 16-31.
- Kori, Shiro (2006a) Inritsu tokucho no chikisa. *Inritsu to Onseigengo Johoshori*, pp. 50-64. Tokyo: Maruzen.
- Kori, Shiro (2006b) Kumamotoshi oyobi shuhen no hiteikei akusento hogen ni okeru gooncho to onchoku no keisei. *Journal of the Phonetic Society of Japan*, 10:2, 43-60.

Reference

- Kubo, Tomoyuki (1989) Fukuoka hogen no, dare nani to no gumonshi o fukumu bun no pitchi pataan. *Kokugogaku* 156, 81-71.
- Kubozono, Haruo (1988) *The Organization of Japanese Prosody*. Ph.D. dissertation, Edinburgh University.
- Kubozono, Haruo (1997) Akusento intoneeshon kozo to bunpo. M. Kunihiro et al. (eds.) *Nihongo Onsei 2: Akusento Intoneeshon Rizumu to Poozu*, pp. 203-229. Tokyo: Sanseido.
- Ladd, D. Robert (1996) *Intonational Phonology*. Cambridge: Cambridge University Press.
- Maekawa, Kikuo (1990) Muakusentohogen no intoneeshon (shiron). *Studies in phonetics and speech communication* IV, 87-110.
- Maekawa, Kikuo (1994a) Is there "dephrasing" of the accentual phrase in Japanese?. *OSU Working Paper in Linguistics* 44, 146-165.
- Maekawa, Kikuo (1997) Akusento to intoneeshon -akusento no nai chiiki. R. Sato et al. (eds.) *Nihongo onsei 1: Shohogen no Akusento to Intoneeshon*, pp. 97-122. Tokyo: Sanseido.
- Pierrehumbert, Janet (1980) *The Phonology and Phonetics of English Intonation*. Ph.D. thesis, MIT.
- Pierrehumbert, Janet and Mary Beckman (1988) *Japanese tone structure*. MIT Press.
- Poser, William (1984) *The Phonetics and Phonology of Tone and Intonation in Japanese*. Ph.D. thesis, MIT.

Reference

- Sato, Kumiko (2006) Morokata hogen ni okeru "ikkei akusento" no jitsugen to edawakare kozo. Kyushu Hogen Kenkyukai (June 1 at Kwassui Women's Colledge, Nagasaki, Japan)
- Shibatani, Masayoshi (1990) *The Languages of Japan*. Cambridge University Press.
- Sugito, Miyoko (2001) Bunpo to nihongo no akusento oyobi intoneeshon -Tokyo to Osaka no baai-. *Bunpo to Onsei*, pp. 197-210. Tokyo: Kuroshio.
- Tanaka, Nobuhiro (2003) Rikyuchu Miyako hogen akusento no jisso. *Kokugogaku* 54:4, 44-59.
- Uwano, Zendo (1977) Nihongo no akusento. M. Sugito (ed.) *Iwanamikoza nihongo 5: On'in*. pp. 281-321, Iwanami.
- Uwano, Zendo (1980) Akusento no kozo. T. Shibata (ed.) *Kozagengo 1: Gengo no kozo*, pp. 87-134. Taishukan.
- Uwano, Zendo (1984) Niigataken Murakamishi hogen no akusento. Kindaichi Haruhiko Hakushi Koki Kinen Ronbunshu 2. Tokyo: Sanseido.
- Uwano, Zendo (1989) Nihongo no akusento. M. Sugito (ed.) *Koza nihongo to nihongokyoiku 2: Nihongo no onsei, on'in*, vol. 1, pp. 178-205. Meiji Shoin.
- Uwano, Zendo (1992) Noborikaku ni tsui te. *The bulletin of the Phonetic Society of Japan* 199, 1-13.
- Uwano, Zendo (1998) Classification of Japanese accent systems. S. Kaji (ed.) *Proceedings of the Symposium Cross-Linguistic Studies of Tonal Phenomena, Tonogenesis, Typology, and Related Topics*, pp. 151-178.
- Yamaguchi, Koyo (1998) Nihongo Hogen Ikkei Akusento no Kenkyu. Tokyo: Hitsujii Shobo.