‘Rising’ pitch accent of Goshogawara Japanese?

IGARASHI, Yosuke
(五十嵐康浩)

Japan Society for the Promotion of Science
National Institute for Japanese Language
yosuke.igarashi@kokken.go.jp

November 24, 2006
Korea University

1. Introduction

• Aims
  – This study investigates the prosodic* structure of Goshogawara Japanese spoken in Aomori Prefecture.
  – In particular, it highlights the behaviors of rising pitch accent in this dialect
  
  * ‘Prosody’ here indicates lexical pitch accents and intonation in a general sense.

1.1 Rising pitch accent & pitch pattern alternation

• Rising pitch accent
  – Falling pitch accent (下げ核)
    • The accented syllable or mora exhibits pitch fall
    • The type of pitch accent observed in majorities of Japanese dialects including Tokyo and Osaka
  – Rising pitch accent (昇り核)
    • The accented syllable or mora exhibits pitch rise
    • The type of pitch accent with limited distribution
      – Hirokaki, spoken in Aomori Pref. (Uwano 1977)
      – Shizukuishi, spoken in Iwate Pref. (Uwano 1977, 1992)

• Pitch pattern alternation
  – Accented words show two types of pitch patterns (Uwano 1977)
    • Non-connective form (非連続形)
      – The form which occurs when the word is pronounced with juncture
      – The pitch pattern with the final fall
    • Connective form (連続形)
      – The form which occurs when the word is pronounced without juncture
      – The pitch pattern without the final fall

– Unaccented words do not exhibit the alternation

– Pitch pattern alternation is observed in a limited number of dialects
  – Hirokaki, spoken in Aomori Pref. (Uwano 1977)
  – Shizukuishi, spoken in Iwate Pref. (Uwano 1989, 1992)
1.2 Research question

• Where does the final fall of the non-connective form come from?
  – Phrasal Fall Hypothesis
    • The final fall is a property of the phrase
    • Claimed by Uwano (1998) for Shizukuishi
      […] a fall in this dialect is not a property of the word but of
      phrase-final position. (pp. 157)
  – Accentual Fall Hypothesis
    • The final fall is a property of the accented word
      (i.e. a part of lexical pitch accent)
    • Suggested by Hattori (1979) for Hirosaki

• The two hypotheses make different predictions regarding
  the pitch of the words following an accented word in
  the non-final position of a phrase (i.e. connective form)
  – The predictions of the Phrasal Fall Hypothesis
    • There should be no pitch difference regardless of whether the
      preceding word is accented or unaccented
  – The predictions of the Accentual Fall Hypothesis
    • 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

1.2 Research 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 downstep
      - Downstep
    – Descriptions that speak of downstep in Hirosaki can be
      found in Uwano (1977)
    – The existence of downstep is considered by Hattori
      (1979) to be support for the Accentual Fall Hypothesis

1.2 Research 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 difference in the pitch of 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

2. Experiment

• 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

• Hypothesis
  – Phrasal Fall hypothesis
    • The final fall is a property of the phrase
    • Prediction: 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 word
    • Prediction: there should be a certain pitch difference
      depending on whether the preceding word is accented or
      unaccented
    • Possible difference: presence or absence of downstep and
      initial lowering
2.1 Methods

- **Subjects**
  - Two 21-year old female native speakers of Goshogawara, K and M

- **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
  - The acoustic analysis is based on the measurement of the extracted fundamental frequency (F0), using Praat software (Boersma & Weenik 2005)

2.2.1 Downstep

- **DATASET I**

<table>
<thead>
<tr>
<th>(U)</th>
<th>(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>onago-ga o'yoi-da.</td>
<td>The girl swam.</td>
</tr>
<tr>
<td>onago-ga o'yoi-da.</td>
<td>The girl swam.</td>
</tr>
<tr>
<td>onago-ga o'yoi-da.</td>
<td>The girl swam.</td>
</tr>
<tr>
<td>onago-ga o'yoi-da.</td>
<td>The girl swam.</td>
</tr>
<tr>
<td>onago-ga o'yoi-da.</td>
<td>The girl swam.</td>
</tr>
</tbody>
</table>

- **DATASET II**

<table>
<thead>
<tr>
<th>U (♀K)</th>
<th>A (♀K)</th>
</tr>
</thead>
<tbody>
<tr>
<td>KORE a'mori-no o'nigiri-da.</td>
<td>This is a rice ball from Aomori.</td>
</tr>
<tr>
<td>KORE a'mori-no omiyage-da.</td>
<td>This is a souvenir from Aomori.</td>
</tr>
<tr>
<td>OGINAWA a'mori-no o'nigiri-da.</td>
<td>This is a rice ball from Aomori.</td>
</tr>
<tr>
<td>OGINAWA a'mori-no omiyage-da.</td>
<td>This is a souvenir from Aomori.</td>
</tr>
<tr>
<td>KORE a'mori-no o'nigiri-da.</td>
<td>This is a rice ball from Aomori.</td>
</tr>
<tr>
<td>KORE a'mori-no omiyage-da.</td>
<td>This is a souvenir from Aomori.</td>
</tr>
</tbody>
</table>

- **DATASET III**

<table>
<thead>
<tr>
<th>U (♀M)</th>
<th>A (♀M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>are a're: ma'ime-da.</td>
<td>Those are good-tasting beans.</td>
</tr>
<tr>
<td>are a're: ma'ime-da.</td>
<td>Those are good-tasting beans.</td>
</tr>
<tr>
<td>are a're: ma'ime-da.</td>
<td>Those are good-tasting beans.</td>
</tr>
<tr>
<td>are a're: ma'ime-da.</td>
<td>Those are good-tasting beans.</td>
</tr>
<tr>
<td>are a're: ma'ime-da.</td>
<td>Those are good-tasting beans.</td>
</tr>
</tbody>
</table>

2.2.1 Downstep

- **DATASET II-b**

<table>
<thead>
<tr>
<th>U (♀K)</th>
<th>A (♀K)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U(♀K)</td>
<td>U(♀K)</td>
</tr>
<tr>
<td>U(♀K)</td>
<td>U(♀K)</td>
</tr>
<tr>
<td>U(♀K)</td>
<td>U(♀K)</td>
</tr>
<tr>
<td>U(♀K)</td>
<td>U(♀K)</td>
</tr>
<tr>
<td>U(♀K)</td>
<td>U(♀K)</td>
</tr>
</tbody>
</table>

- **DATASET III**

<table>
<thead>
<tr>
<th>U (♀M)</th>
<th>A (♀M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U(♀M)</td>
<td>U(♀M)</td>
</tr>
<tr>
<td>U(♀M)</td>
<td>U(♀M)</td>
</tr>
<tr>
<td>U(♀M)</td>
<td>U(♀M)</td>
</tr>
<tr>
<td>U(♀M)</td>
<td>U(♀M)</td>
</tr>
<tr>
<td>U(♀M)</td>
<td>U(♀M)</td>
</tr>
</tbody>
</table>

2.2.1 Downstep

- **Peak of the 2nd word (Hz) (all data included)**

<table>
<thead>
<tr>
<th>Subject K</th>
<th>Subject M</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st word = Accented</td>
<td>1st word = Unaccented</td>
</tr>
</tbody>
</table>

150 | 200 | 250 | 300
---|---|---|---
Accentedness of 2nd word

150 | 200 | 250 | 300
---|---|---|---
Accentedness of 2nd word

1st word = Accented
1st word = Unaccented
2.2.1 Downstep

- Summary of 2.1.1 (Downstep)
  - Clear downstep effect of the accented words was found
    - The pitch range of the following word was significantly smaller for A+A (유핵+유핵) and A+U (유핵+무핵) than for U+A (무핵+유핵) and U+U (무핵+무핵)
  - The results agree with Accentual Fall Hypothesis

2.2.2 Initial lowering

- Dataset IV (Focus on the second word)
  - Subject K
  - Subject M

- Dataset V (Focus on the first word)
  - Subject K
  - Subject M
2.2.2 Initial lowering

- Summary of 2.1.2 (Initial lowering)
  - Accentedness (유핵 or 유핵) of the preceding word affected the initial lowering
    - When preceding word was unaccented (무핵), the initial lowering disappeared
    - Even when the word was focused, degree of the initial lowering was smaller when the preceding word was unaccented (무핵) than when the preceding word was accented (유핵)
  - The results favors Accentual Fall Hypothesis

3. Conclusion

- The present study investigated the prosodic structure of Goshogawara Japanese, highlighting the behaviors of its ‘rising pitch accent’
- The results of the experiment revealed that the ‘rising’ pitch accent had a ‘falling’ property regardless of whether the accented word was in connective form or non-connective form
- The rising pitch accent of Goshogawara should have not only a ‘rising’ property in the accented syllable, but also a ‘falling’ property
- The ‘falling’ property should be realized as the word-final fall in the phrase-final position, while in the non-final position it should be manifested both as a pitch range compression (downstep) and as the initial lowering of the following word
### Accentual system of Goshogawara

<table>
<thead>
<tr>
<th>Unaccented words with one syllable</th>
</tr>
</thead>
<tbody>
<tr>
<td>mi</td>
</tr>
<tr>
<td>aki</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unaccented words with two syllables</th>
</tr>
</thead>
<tbody>
<tr>
<td>u me</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unaccented words with three syllables</th>
</tr>
</thead>
<tbody>
<tr>
<td>ki mo mo</td>
</tr>
</tbody>
</table>

**Pitch pattern alternation**

**Accented words: Alternation of low and high**

**With juncture:**
- Non-connective form
- Connective form

**Without juncture:**
- Connective form

**Unaccented words: No alternation**

**With juncture:**
- Connective form

**Without juncture:**
- Connective form

---

### Pitch pattern alternation

**Unaccented words: No alternation**

**With juncture:**
- Connective form

**Without juncture:**
- Connective form

---

**With juncture:**
- Connective form

**Without juncture:**
- Connective form

---

**With juncture:**
- Connective form

**Without juncture:**
- Connective form