Accent deletion and phrase formation in Fukuoka Japanese

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1. Introduction

(1) Background

a. Fukuoka Japanese (FJ) has a wh-specific intonational structure (Hayata 1985; Kubo 1989 et seq.)
   - Has implications for the study of the syntax-prosody interface:
     - Needs information beyond phrase edges and focused constituents (Selkirk 2000, 2003)
     - Makes reference to a wh chain (a wh element and its coindexed C) ➔ see Richards (2006, this workshop)

b. The FJ intonation pattern is independent of post-focus accent reduction
   - Differs from Tokyo Japanese (see, e.g., Ishihara 2002, 2003; Deguchi & Kitagawa 2002)
   - FJ has a wh-specific intonational contour

(2) Goals of this talk

a. To provide empirical support for one aspect of the Hayata/Kubo description
   - Lexical pitch accents are deleted inside the wh-intonation span
b. To organize and interpret a fuller range of the wh data described by Kubo
   - Develop a preliminary OT analysis of accent deletion and phonological-phrase formation in FJ
   - Consider some broader implications of this analysis

2. WH intonation in FJ: Basic facts

(3) “Fukuoka dialect” Kubo (1989 et seq.)

a. Spoken in the city of Fukuoka (Fukuoka pref., Kyushu) and the surrounding area
b. The city can be broadly divided into two subareas, Hakata and Fukuoka

b. There are differences between Hakata and Fukuoka dialects, but they generally pattern together with respect to the wh phenomena discussed here

3. Example of accent deletion (participant 5)

a. Yes-no question: No wh intonational contour; no accent deletion ː realized accent
   - age-na mono-ga aru to Ø[+WH]?
   - ‘Is there that kind of thing?’

b. WH question: Subject to wh intonational contour; accent deletion ː unrealized acc
   - doge+[WH]-na mono-ga aru to Ø[+WH]?
   - ‘What kind of thing is there?’

(4) The wh intonational contour: Rule-based analysis, from Kubo (1992 et seq.)

a. Between a wh expression and a coindexed C[+WH] such as ka, all pitch accents and phonological-phrase (PhP) boundaries are deleted
   - “Flat H-tone contour” is actually long span with no pitch accents
b. The resulting single PhP is assigned a default penultimate accent
   - Exception: With null C[+WH] (matrix clause only), no accent is inserted

(5) Reinterpretation from a constraint-based perspective (preliminary version)

a. A wh expression and a coindexed C[+WH] such as ka must be in the same PhP (see also Richards (2006, this workshop)

b. This PhP must bear unmarked penultimate accent

c. A matrix null C[+WH] resists the default accent assignment (but lexical accents are still lost)

(6) Example of accent deletion (participant 5)

a. Yes-no question: No wh intonational contour; no accent deletion ₪: realized accent
   - age-na mono-ga aru to Ø[+WH]?
   - ‘Is there that kind of thing?’

b. WH question: Subject to wh intonational contour; accent deletion ₪: unrealized acc
   - doge+[WH]-na mono-ga aru to Ø[+WH]?
   - ‘What kind of thing is there?’
3. Empirical investigation of the WH contour

(7) Claim to test: Accents are deleted in a wh question in FJ
- Four experimental conditions, plus hypothesis based on Hayata/Kubo analysis

<table>
<thead>
<tr>
<th></th>
<th>lexically accented</th>
<th>lexically unaccented</th>
</tr>
</thead>
<tbody>
<tr>
<td>YN question</td>
<td>mono-ga (accent realized)</td>
<td>niwa-ni (no accent realized)</td>
</tr>
<tr>
<td>WH question</td>
<td>mono-ga (no accent realized)</td>
<td>niwa-ni (no accent realized)</td>
</tr>
</tbody>
</table>

(8) Participants
- Four undergraduate students at Kyushu University (three female, one male)
- Self-reported native speakers of FJ
- Received token thank-you gifts for participation

(9) Materials (recorded as part of a larger set of utterances)
- 2 sentence sets, the 8-mora set and the 10-mora set
  - Each set had 1 sentence from each of the following categories (2 repetitions)
    - YN-acc: yes/no question containing accented lexical item
    - WH-acc: wh question containing accented lexical item
    - YN-un: yes/no question with only unaccented lexical items
    - WH-un: wh question with only unaccented lexical items
  - Within each set, the sentences were designed in segmentally matched pairs
    - YN-acc and WH-acc: identical except for the initial word (wh or not)
    - YN-un and WH-un: identical except for the initial word (wh or not)
    - However, ACC and UN items were not matched segmentally

(10) Sentence sets
- The critical mora is underlined (lexically accented mora, or equivalent position)
  - 8-mora set
      - that.kind.of [thing-nom] exist
      - what.kind.of [thing-nom] exist
      - bride-nom [thing-nom] exist
      - who-nom [thing-nom] exist
  - 10-mora set
      - that.kind.of [woman-nom] be.visible
      - what.kind.of [woman-nom] be.visible
      - that.kind.of [iris-nom] be.visible
      - what.kind.of [iris-nom] be.visible

(11) Measurement procedure
  - Analysis was carried out in Praat, v. 4.6.04
  - The critical mora was demarcated and its mean F0 was recorded
  - F0 measurements were also taken at these duration points:
    - 100ms and 200ms after the right edge of the critical mora
    - Why these values?
      - 100ms seemed to approximate one mora
      - 200ms because generational difference in accent perception reported by Hayata (1985: 7-9) might mean that young FJ speakers have a slower F0 fall
  - Two values were computed for each utterance:
    - F0 change at 100ms = (Critical-mora mean F0) – (F0 at 100ms point)
    - F0 change at 200ms = (Critical-mora mean F0) – (F0 at 200ms point)

(12) Sample utterances, with measurement points labeled
  - a. YN-acc (participant 5) age-na monó-ga aru to?
  - b. WH-acc (participant 5) doge[+WH]-na monó-ga aru to?
(13) Predictions
a. The F0 change for YN-acc should represent the usual realization of an accent
b. If accents are lost in WH questions:
   i. YN-acc F0 change should be significantly larger than WH-acc F0 change
   ii. WH-acc F0 change should not be different from those for WH-un, YN-un

(14) Results: F0 change at 100ms (Hz)

a. Means by participant for each condition

<table>
<thead>
<tr>
<th>Participants</th>
<th>YN-acc</th>
<th>WH-acc</th>
<th>YN-un</th>
<th>WH-un</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>16.89</td>
<td>6.04</td>
<td>6.00</td>
<td>11.52</td>
</tr>
<tr>
<td>3</td>
<td>25.60</td>
<td>7.12</td>
<td>6.78</td>
<td>5.89</td>
</tr>
<tr>
<td>4</td>
<td>33.55</td>
<td>4.03</td>
<td>-0.10</td>
<td>1.89</td>
</tr>
<tr>
<td>5</td>
<td>66.94</td>
<td>9.67</td>
<td>3.67</td>
<td>8.37</td>
</tr>
<tr>
<td>Mean</td>
<td>35.74</td>
<td>6.73</td>
<td>4.09</td>
<td>6.92</td>
</tr>
</tbody>
</table>

b. Statistical analysis: Mixed model, to account for multiple observations within subject
   i. YN-acc different from mean of other 3 conditions

| Estimates | Label Estimate | Standard Error | DF | t Value | Pr > |t|
|-----------|---------------|----------------|----|---------|------|
| YN-acc vs mean of YN-u WH-a WH-u | 29.8310 | 3.7640 | 57 | 7.93 | <.0001 |

ii. WH-acc, YN-un, WH-un not different

<table>
<thead>
<tr>
<th>Contrasts</th>
<th>Label</th>
<th>Num DF</th>
<th>Den DF</th>
<th>F Value</th>
<th>Pr &gt; F</th>
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</thead>
<tbody>
<tr>
<td>ITEM_TYPE</td>
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<td>57</td>
<td>21.09</td>
<td>&lt;.0001</td>
<td></td>
</tr>
<tr>
<td>YN-u vs. WH-a vs. WH-u</td>
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<td>57</td>
<td>0.24</td>
<td>0.7906</td>
<td></td>
</tr>
</tbody>
</table>

(15) F0 change at 200ms (Hz)

a. Means by participant for each condition

<table>
<thead>
<tr>
<th>Participants</th>
<th>YN-acc</th>
<th>WH-acc</th>
<th>YN-un</th>
<th>WH-un</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>40.11</td>
<td>13.92</td>
<td>14.54</td>
<td>16.17</td>
</tr>
<tr>
<td>3</td>
<td>39.98</td>
<td>14.40</td>
<td>16.85</td>
<td>10.25</td>
</tr>
<tr>
<td>4</td>
<td>43.68</td>
<td>3.26</td>
<td>5.31</td>
<td>0.15</td>
</tr>
<tr>
<td>5</td>
<td>93.70</td>
<td>22.48</td>
<td>26.80</td>
<td>14.37</td>
</tr>
<tr>
<td>Mean</td>
<td>54.37</td>
<td>13.52</td>
<td>15.88</td>
<td>10.23</td>
</tr>
</tbody>
</table>

b. Statistical analysis: Mixed model, to account for multiple observations within subject
   i. YN-acc different from mean of other three conditions

| Estimates | Label Estimate | Standard Error | DF | t Value | Pr > |t|
|-----------|---------------|----------------|----|---------|------|
| YN-a vs mean of YN-u WH-a WH-u | 41.1594 | 3.9222 | 57 | 10.49 | <.0001 |

ii. WH-acc, YN-un, WH-un not different

<table>
<thead>
<tr>
<th>Contrasts</th>
<th>Label</th>
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<th>Den DF</th>
<th>F Value</th>
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<tr>
<td>YN-u vs. WH-a vs. WH-u</td>
<td>2</td>
<td>57</td>
<td>0.70</td>
<td>0.5027</td>
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</tbody>
</table>

(16) Conclusion of empirical study

The results of this small-scale study support the claim that accents are deleted in the wh intonational span
4. OT analysis of (aspects of) the wh intonational contour

Overview of the analysis

a. \text{\texttt{\textbf{\textup{\textbf{\textsc{Wrap-C}}}}}} Every \(C_{\text{\textsc{wh}}}\) is required to be in the same \text{\textbf{\textsc{PhP}}} with some \textbf{\textsc{wh}} element with which it is coindexed (\text{\textsc{Wrap-Xp}, \textsc{-Vp}: Truckenbrodt 1995})

b. \text{\texttt{\textbf{\textsc{Align-L(CP)}}}} Every \CP\ left-edge must be aligned with some \text{\textbf{\textsc{PhP}}} left-edge (but \text{\texttt{\textbf{\textsc{Wrap-C}}}} takes priority) (\text{\textsc{Align-X: McCarthy & Prince 1993}})

c. \text{\texttt{\textbf{\textsc{Align-L(wh)}}}} Every \textbf{\textsc{wh}} element must appear at the left edge of a \text{\textbf{\textsc{PhP}}}

d. and a possible role for: \text{\texttt{\textbf{\textsc{Align-L(Focused)}}}} Every focused element must appear at the left edge of a \text{\textbf{\textsc{PhP}}}

Transcription conventions

- Data in this section are taken from the meticulous, detailed impressionistic descriptions by Tomoyuki Kubo, especially Kubo (1989, 1990a)
- \{\} demarcates the “flat high tone” intonational contour
- ^ marks sentence-final rising tone
- | marks a \text{\textbf{\textsc{PhP}}} boundary (induced from Kubo’s pitch contour)
- Penult accent is marked (\texttt{\textup{\textbf{o}}}) inside the \{\} domain if it is realized
- Inside \{\} or outside, accents are marked (\texttt{\textup{\textbf{o}}}) only when actually realized
- Some changes from Kubo’s original presentation of the data:
  i. I have added some syntactic bracketings and traces (\texttt{\textup{\textbf{\textsc{t}}}}) or empty arguments (\texttt{\textup{\textbf{\textsc{e}}}})
  ii. I’m treating “meisi-ku” (Kubo 1989) as \text{\textbf{\textsc{DP}}} rather than \text{\textbf{\textsc{NP}}}
  iii. I’m using \CP\ for \S'

4.1 \text{\texttt{\textbf{\textsc{Wrap-C vs. Align-}}} Inclusion for \texttt{\textbf{\textsc{C}}}_{\text{\textsc{wh}}}\textsc{'}} takes precedence over edge marking for \textbf{\textsc{wh}}, \textbf{\textsc{CP}}

A. Two \textbf{\textsc{wh}} elements bound by same \textbf{\textsc{C}}

- Requires phrase break at “constituent” (apparently \text{\textbf{\textsc{CP}}}? anything else?) containing second \textbf{\textsc{wh}} element
- A \textbf{\textsc{wh}} intonational contour is initiated at the first \textbf{\textsc{wh}} element (even though there is no \textbf{\textsc{C}} at the right edge) and again at the second \textbf{\textsc{wh}} element

\[\{ \texttt{\textbf{\textsc{doko}}}_{\text{\textsc{-no kuni kara kita hito to kekkon sita to}} \texttt{\textbf{\textsc{O}}}_{\text{\textsc{wh}}}^\text{\textsc{^}1}} \} \mid \{ \texttt{\textbf{\textsc{nan}}}_{\text{\textsc{-nin ki-ta tte}}} \texttt{\textbf{\textsc{C}}}_{\text{\textsc{wh}}}^\text{\textsc{^}1}\} \] (Kubo 1989: 3)

\text{\texttt{\textbf{\textsc{where-GEN university-GEN student-NOM how.many.people come-PRF C,quot}}} ‘How many students came from which university, reportedly?’
- Kubo (1989: 3) explicitly says ungrammatical without the break

B. Multiple nested \textbf{\textsc{wh/CP}} dependencies

- Outermost \textbf{\textsc{wh}} dependency prevails; no phrase break at inner \textbf{\textsc{wh}} element

\[\{ \texttt{\textbf{\textsc{dare}}}_{\text{\textsc{-ga kyonen}}} \} \mid \{ \texttt{\textbf{\textsc{doko}}}_{\text{\textsc{-no kuni kara kita hito to kekkon sita to}} \texttt{\textbf{\textsc{O}}}_{\text{\textsc{wh}}}^\text{\textsc{^}1}} \} \]

\text{\texttt{\textbf{\textsc{who-NOM last.year where-GEN country-GEN from came person with married NZR C}}} ‘Who married, last year, the person who came from which country?’
- Kubo (1989: 3 explicitly says ungrammatical if high-tone span ends at ka

\[\{ \texttt{\textbf{\textsc{dare}}}_{\text{\textsc{-ga}}}, \texttt{\textbf{\textsc{goko}}}_{\text{\textsc{-ni iku ka}}} \} \texttt{\textbf{\textsc{sittóo} to ya}} \texttt{\textbf{\textsc{O}}}_{\text{\textsc{wh}}}^\text{\textsc{^}1}\} \]

\text{\texttt{\textbf{\textsc{who-NOM we-NOM where-LOC go C know.NZR COP C}}} ‘Who know where we are going?’
- Kubo (1989: 3 explicitly says ungrammatical if high-tone span ends at ka

\[\{ \texttt{\textbf{\textsc{dare}}}_{\text{\textsc{-ga}}}, \texttt{\textbf{\textsc{goko}}}_{\text{\textsc{-ni iku ka}}} \} \texttt{\textbf{\textsc{sittóo} to ya}} \texttt{\textbf{\textsc{O}}}_{\text{\textsc{wh}}}^\text{\textsc{^}1}\} \]

\text{\texttt{\textbf{\textsc{who-NOM we-NOM where-LOC go C know.NZR COP C}}} ‘Who married the person who came last year from which country?’

Observations:

- A \texttt{\textbf{\textsc{C}}}_{\text{\textsc{wh}}}\texttt{' must be in a \text{\textbf{\textsc{PhP}}} with at least one associated \textbf{\textsc{wh}} element (seen in A, B)
- A \textbf{\textsc{wh}} element prefers to fall at the left edge of a \text{\textbf{\textsc{PhP}}} over being included in the same \text{\textbf{\textsc{PhP}}} with its \textbf{\textsc{C}} (seen in A)
- When the H-tone span will be broken anyway, it is preferentially broken at the left edge of \text{\textbf{\textsc{CP}}} as well (seen in A)
- When these factors conflict, \textbf{\textsc{wh}} at left edge and \textbf{\textsc{CP}} at left edge are both sacrificed to satisfy the \text{\textsc{C}} wrap effect (seen in B)

\[\{ \texttt{\textbf{\textsc{dare}}}_{\text{\textsc{-ga}}}, \texttt{\textbf{\textsc{goko}}}_{\text{\textsc{-ni iku ka}}} \} \texttt{\textbf{\textsc{sittóo} to ya}} \texttt{\textbf{\textsc{O}}}_{\text{\textsc{wh}}}^\text{\textsc{^}1}\} \]

\text{\texttt{\textbf{\textsc{you who-NOM we-NOM where-LOC go C know.NZR COP C}}} ‘Do you know where we are going?’
- Kubo (1989: 4)

\[\{ \texttt{\textbf{\textsc{dare}}}_{\text{\textsc{-ga}}}, \texttt{\textbf{\textsc{goko}}}_{\text{\textsc{-ni iku ka}}} \} \texttt{\textbf{\textsc{sittóo} to ya}} \texttt{\textbf{\textsc{O}}}_{\text{\textsc{wh}}}^\text{\textsc{^}1}\} \]

\text{\texttt{\textbf{\textsc{you who-NOM we-NOM where-LOC go C know.NZR COP C}}} ‘Do you know where we are going?’
- Kubo (1989: 4)

4.2 The case of cross-serial dependencies: A Focus effect?

- Kubo (1990ab) describes prosody of echo-questions (’Who ate natto?’ / ’Who ate \textbf{\textsc{what}}?’) and “meta-questions” (’Who ate natto?’ / ’I forgot \textbf{\textsc{what}} you asked who ate.’)
- Structurally, these involve cross-serial dependencies (may not need K’s \textbf{\textsc{meta}} feature)
(25) Echo-question example (dialogue between A and B) (K 1990a: 113)

A: imantóko | { [CP itu, Kyooto ikú ka,] } | wakar-án
right.now when Kyoto go C know-NEG
‘At the moment, (I) don’t know when (I)’ll go to Kyoto.’

B: { [CP itu] } | { doko, iku ka, } wakaran tte* Ø 1+WH1 }
when  QUOT C forget
‘(You) say (you) don’t know when (you)’ll go WHERE?’

(26) Meta-question examples (A, B, C are different speakers) (K 1990a: 115)

A: { [CP itu, Tanaka to Nagasaki ikú ka,] } | wakar-án
when Tanaka with Nagasaki go C know-NEG
‘(I) don’t know when (I)’ll go to Nagasaki with Tanaka.’

B: { [CP itu, Tanaka to } | { doko, iku ka, } wakaran tte i-yot-tá ka, } | wasureta
when  WHERE go C know-NEG C.QUOT say-PRG-PRF C forget
‘(I) forgot WHERE you were saying (you) don’t know when (you)’ll go [there] with Tanaka.’

C: { [CP itu, } | { dare, to doko, iku ka, } wakar-an tte i-yot-tá ka, wasureta tte when
WHO with WHERE go C know-NEG C.QUOT say-PRG-PRF C forget C.QUOT
i-yottá ka, } wasureta
say-PRG-PRF C forget
‘(I) forgot WHO you were saying you forgot WHERE (she) was saying (she) doesn’t know when (she)’ll go [there] with [them].’

(27) Analysis so far correctly chooses location of phrase break

a. Attested pattern: * { [CP ... } | { wh_2 } | { wh_1-C_2 } —C_1 }
   Violates WHAP-C once (C_2 not in PhP with wh)
   Satisfies ALIGN-L(WH)

b. Competing candidate: * { [CP ... } | { wh_2—wh_1—C_2 } —— C_1 }
   Violates WHAP-C once (C_1 not in PhP with wh)
   Violates ALIGN-L(WH) once (at wh)

(28) But another candidate seems wrongly predicted to win —?

c. Competing candidate: * { [CP ... } | { wh_2—wh_1—C_2 } —— C_1 }
   Satisfies WHAP-C
   Violation of ALIGN-L(WH) (at wh) should be irrelevant

(29) Possible explanation?

a. As Richards (2006: 53-54) points out, echo questions typically involve destressing or reduction of all but the wh element (since everything else is old information)

b. Perhaps this is true in FJ as well, and a high-ranking ALIGN-L(FOCUS) (which dominates even WRAP-C) is responsible for the phrase break at wh in (27a)

c. Focus is known to trigger a left phrase edge in Tokyo Japanese (Nagahara 1994; Sugahara 2003)

(30) More exceptional (?) behavior from cross-serial wh dependencies

A: { [CP dare,-ga ] | { itu, Kyooto ikú ka,] } wasuréta (K 1990a: 113)
who-NOM when Kyoto go C forget
‘(I) forgot who’s going to Kyoto when.’

B: { [CP dare,-ga itu, ] | { doko, iku ka, } wasureta tte* Ø 1+WH1 }
who-NOM when WHERE go C forget QUOT C
‘You’re saying (you) forgot who’s going WHERE when?’

Kubo 1990a: 113-114 (my somewhat loose paraphrase)

We would expect the phrasing { dare-ga } | { itu ...’, but this is not what happens. ... Here, let us assume that because of the focus on doko, the PhP { itu } has been weakened.

(31) Conclusions from analysis so far

a. Every C_1+WH must be phrased with its wh element, except in some cases involving echo-questions/meta-questions

b. Much more frequently, a wh element fails to be phrased with its C_1+WH

c. Thus, it seems that the condition on wh prosody proposed by Richards (2006:10) can be seen as a requirement imposed by C rather than by wh elements

d. On the other hand, the characteristic wh intonational contour is initiated by every wh element, even when not phrased with its C

5. Some remaining questions

5.1 What is the PhP?

(32) No matter how long the sentence is, there can be no phonological phrase breaks at all in the wh span (K 1989: 2)
Evidence: No "initial lowering" inside the wh span (IL is a diagnostic for MiP edge)

Evidence for default accent insertion (Kubo 1989: 8-9)

5.2 Why is responsible for accent deletion in the wh span?

5.3 Why does the wh contour stop at the right edge of the C?

Right edge of wh contour at coindexed C (plus cliticized particles; see 37b)

5.2 What is responsible for accent deletion in the wh span?

5.3 Why does the wh contour stop at the right edge of the C?
6. Conclusions

(41) Initial empirical confirmation for the claim that accents are lost in the FJ wh intonation contour

(42) Evidence that the C is responsible for the wh-related PhP Wrap effect, and the wh element is responsible for the accent deletion

Acknowledgments

Many thanks to the following people:
- For assistance with experimental materials design and planning: Tomoyuki Kubo, Izumi Nishioka, Tsutomu Sakamoto, Lisa Selkirk
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- For discussion and feedback on this and earlier versions of this project: Randy Hendrick, Mako Hirota, Shigeto Kawahara, Tomoyuki Kubo, Elliott Moreton, Mariko Sugahara, Mike Terry
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References


