Introduction

- Major questions pertaining to the nature of the syntax/phonology interface — and how Fukuoka Japanese (FJ) bears on these questions

1. What kinds of information from the syntax are accessible to the prosody/phonology?
   (a) $X^0$ / XP edges
   (b) Focus
   • Is there a necessary role for wh features?
   $\rightarrow$ FJ seems to show that there is

2. Is the syntax/phonology interface necessarily derivational (phases/MP)? Is it compatible with a parallel (OT) model?
   $\rightarrow$ Preliminary FJ results suggest that a phase-based “Multiple Spell-Out” account might be less successful \textit{(requires more investigation)}

3. What is the nature of the constraints that mediate between syntax and phonology?
   (a) Alignment
   (b) $W_{\text{RAP}}$
   • Richards (2006) — A $W_{\text{RAP}}$-like requirement that groups together the wh element and the [+wh] complementizer?
   $\rightarrow$ FJ supports this view and allows further exploration of this proposal

4. Structure of the talk
   §1 Prosody and the syntax/phonology interface
   §2 Intonation basics in Tokyo and Fukuoka Japanese
   §3 wh-related prosody in Tokyo and Fukuoka Japanese
   §4 Empirical investigation of the FJ wh contour
   §5 Theoretical implications: The wh/C phrasing condition
   §6 Conclusions
1. **Prosody and the syntax/phonology interface**

A. How do syntax and phonology interact?

(5) Within the Chomskyan tradition, there has been a general assumption that syntax precedes or “feeds” phonology (images from Jackendoff 2003: 109-110)

(a) **Government-Binding Theory** *(Lectures on Government and Binding, 1981)*

![Diagram](diagram1.png)

(b) **Minimalist Program** *(1993)*

![Diagram](diagram2.png)

(6) Questions to pursue:

(a) To what extent does syntactic information influence phonology?
(b) (To what extent does phonological information influence syntax?)

(7) **Intonation** is an aspect of phonological structure that does appear to be influenced by syntactic information

- Different syntactic structure often correlates with distinct intonational contours

(8) Example: Tokyo Japanese *(Selkirk & Tateishi 1988)* [more details in §2]

(a) Some words have a **pitch accent**: a fall from high (H) to low (L) tone
(b) A process known as **downstep** lowers the H in pitch accents in certain contexts
(c) **Syntactic structure matters**: The same string of lexical items is subject to downstep in different ways when the syntactic constituency is different
9) Compare two different structures involving the same lexical items:

\[ \text{Aóyama-no Yamáguchi-no aníyome-ga inai} \quad \text{\(\hat{o} = \) pitch accent} \]

**place.name-GEN prs.name-GEN sister.in.law-NOM exist-NEG**

10) Two possible constituent structures:

\[
[ \text{Aóyama-no Yamáguchi-no aníyome} ]
\]

‘Yamaguchi from Aoyama’s sister in law’

\[
\text{Aóyama-no [ Yamáguchi-no aníyome ]}
\]

‘Yamaguchi’s sister in law, from Aoyama’

11) How the domain of downstep has been characterized (McCawley 1968; Poser 1984; Pierrehumbert & Beckman 1988):

(a) Phonological words are grouped into phonological phrases
(b) One type of phonological phrase is the major phrase (MaP)
(c) Downstep applies in each MaP to all pitch accents after the first
   • On this view, syntax influences downstep by influencing MaP formation

12) Structure with one MaP (example, image from Selkirk & Tateishi 1988: 318)

\[
\begin{align*}
\text{NP} & \quad \text{NP} \\
\text{NP} & \quad \text{V} \\
\text{Aóyama-no Yamáguchi-no} & \quad \text{aníyome-ga inai} \\
\text{\(\text{MaP} (\text{Aóyama-no) (Yamaguchi-no) (aníyome-ga inai)})\text{MaP} \)} \\
\end{align*}
\]

‘the sister-in-law of Y from A’
structure with two MaPs (example, image from Selkirk & Tateishi 1988: 318)

\[
\text{NP}'Y's sister-in-law from A'}
\]

Proposal (Selkirk & Tateishi 1988, 1991):
At every left edge of a lexical XP, there is a left edge of a MaP

Implication: At least some syntactic information is available to the phonology
(see also Selkirk 1981, 1986; Kaisse 1985; Nespor and Vogel 1986; Chen 1987; Truckenbrodt 1999)
Question: How much?
Empirical observation: Syntax/phonology interaction is quite severely restricted
—> The model needs to account for this

B. One approach to the interface: The Extended Edge-Based (EEB) model

Indirect Reference Hypothesis (Inkelas 1989: 9)
Phonological rules refer only to prosodic constituent structure
—> not directly to syntactic structure or constituency
In terms of the above example:
• the domain of downstep is stated in terms of prosodic structure
• not directly in terms of syntactic structure

The EEB model (e.g., Selkirk 1986; Chen 1987; Nagahara 1994; Truckenbrodt 1999)
(a) Prosody has access to information about:
• Edges of lexical heads (X^0) and edges of lexical maximal projections (XP)
• Focus marking on syntactic structure (focus has consequences for both semantics and phonology/intonation)
Different syntactic structures lead to XP edges in different places
—> differences in prosodic structure
—> observed differences in intonation and other phonological effects

C. A second approach: The Multiple Spell-Out (MSO) model

(18) The MSO model (Ishihara 2003, 2007; see also Kratzer & Selkirk 2007) — assuming Minimalist Program: phases, Spell-Out

(a) Basic idea: As each phase of the syntactic derivation is sent to Spell-Out, its information becomes visible to the phonological component

(b) Different syntactic structures lead to different portions of the string of lexical items being grouped as phases and sent to Spell-Out together

• To what extent does this approach still depend on the notion of prosodic structure as an interface level between syntax and phonology?

D. The significance of wh questions in Fukuoka Japanese

(19) Fukuoka may be a case that can distinguish between the EEB and MSO approaches (only briefly discussed today; see §3)

(20) Pursuing an account of FJ wh intonation in the EEB model:
Intonation appears to be sensitive to the syntactic scope of wh elements (§3)

(a) Is this really the case? —> Apparently, yes (§4)

(b) What modifications need to be made to the EEB model to account for this?
  • Application, investigation of wh/C phrasing condition (Richards 2006) (§5)

2. Intonation basics in Tokyo and Fukuoka Japanese

A. Tokyo Japanese intonation

(Classic references in English: McCawley 1968; Poser 1984; Pierrehumbert & Beckman 1988; Selkirk & Tateishi 1988, 1991)

(21) Tokyo Japanese has lexical pitch accents

(a) words may be accented or unaccented

(b) if accented, the location of the accent is also lexically specified for nouns, “particles” (but accent location is predictable for verbs, adjectives)

(c) accent is realized as a pitch fall
(22) Unaccented word: [momoiro] ‘peach color, pink’  audio: http://japanese.about.com/bl_colors.htm
• Basic tonal contour: Starts low(ish), then flat or slightly decreasing high tone

• Basic tonal contour: Starts low(ish); quickly goes high; one designated syllable is the pitch peak (H), after which the pitch drops precipitously
• Phonological analysis of the shape of the pitch accent (Pierrehumbert & Beckman 1988): H*+L (the H* tone associates to the designated accented syllable)

(24) Traditionally, two levels of phonological phrasing are recognized (McCawley 1968; Pierrehumbert & Beckman 1988)
(a) **Minor phrase/MiP** (also ‘accentual phrase’) — words are grouped into MiPs
• Domain of Initial Lowering — the initial low pitch seen in examples above
• Initial low pitch is therefore a diagnostic for the left edge of a MiP
• Only one accented word is permitted per MiP
• Examples of Initial Lowering (Pierrehumbert & Beckman 1988: 27)

(b) **Major phrase/MaP** (also ‘intermediate phrase’) — MiPs are grouped into MaPs
- Domain of downstep, as demonstrated in §1
- Pitch reset is a diagnostic for the left edge of a MaP

(c) A recent proposal by Ito & Mester (2007) suggests that MiP and MaP are simply the minimal and maximal levels of recursive phonological phrase structure, rather than two distinct prosodic units
- this development will not be crucial for today’s talk

• The level of phrasing relevant for FJ wh intonation *may* be the MiP

B. Fukuoka Japanese intonation

(25) “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

(c) There are differences between Hakata and Fukuoka dialects, but they generally pattern together with respect to the intonational phenomena discussed here

*Map image courtesy of Wikimedia Commons, Maps_of_Japan*
(26) Fukuoka Japanese has accented and unaccented words, like Tokyo
(a) Basic assignment of tones to words operates in a similar way
(b) However, the accent of a particular word may differ between the two dialects
   • Example: Tokyo [tábeta] vs. Fukuoka [tabéta] ‘ate’

(27) FJ seems to have Initial Lowering and downstep like TJ —> needs more research
Ore kyó-nen Kyóoto it-ta ze. (Kubo 1989)
I last-year Kyoto went EMPH ‘I went to Kyoto last year, I say.’

3. wh-related prosody in Tokyo and Fukuoka Japanese

(28) Basic facts about wh questions in Japanese
(a) Japanese is a head-final language; constituent order is Subj – Obj – Verb
(b) wh elements are not required to move out of their base-generated position
(c) However, any constituent (except the verb) can be optionally fronted, by a
   process known as scrambling, so a wh element may be fronted for this reason

A. wh-related prosody in Tokyo

(29) Matrix vs. embedded wh scope is distinguished by intonation
(a) a. Non-interrogative sentence (No FI, default pitch contour) (Ishihara 2007: 158-9)
Náoya-wa | Mári-ga nánika-o nomiya-de nónda
N.-TOP M.-NOM something-ACC bar-LOC drank
to | inademo omóteru.
that even.now think
‘Naoya still thinks that Mari drank something at the bar.’
(b) Matrix wh-question (FI at the matrix clause)

\[ \text{Náoya-} | \text{Mari-} | \text{nánî-o} | \text{nomi-} | \text{de} | \text{nônda} \]
N.-TOP  M.-NOM  what-ACC  bar-LOC  drank
to  | inademo  omôteru  no?  | \text{FI}  
that  even.now  think  Q 
‘What did Naoya still think that Mari drank it at the bar?’

(c) Indirect wh-question (FI at the embedded clause)

\[ \text{Náoya-} | \text{Mari-} | \text{nánî-o} | \text{nomi-} | \text{de} | \text{nônda} \]
Naoya-TOP  Mari-NOM  what-ACC  bar-LOC  drank
\text{ka}  | \text{FI}  | inademo  obôeteru.
Q  even.now  remember
‘Naoya still remembers what Mari drank it at the bar.’

(30) Analysis (Ishihara 2002 et seq.) — assuming Minimalist Program, phases, Spell-Out

(a) The wh element is marked with focus

(b) A focused element in TJ is followed by a post-focus reduction intonational contour (pitch range is greatly compressed; pitch accents are barely discernable)

(c) wh-scope/Focus correlation is a consequence of Multiple Spell-Out (see also Kratzer & Selkirk 2007)

- **Embedded wh scope** allows the structure to be sent to Spell-Out when the embedded CP is complete
  
  \[ \rightarrow \text{post-Focus reduction applies, extends only to end of embedded CP} \]

- **Matrix wh scope** means the embedded C cannot be sent to Spell-Out until the whole matrix clause is ready to go
  
  \[ \rightarrow \text{post-Focus reduction must apply to the whole utterance} \]

(31) In Fukuoka, there is also a wh-related prosodic contour

- Can it be handled according to Ishihara’s (2002, 2003, 2007) approach to Tokyo?

- If so, this might avoid the need to extend the EEB model to allow for reference to wh features at the syntax/phonology interface
B. wh-related prosody in Fukuoka

(32) Unusual phenomenon, described originally by Hayata (1985) and in great detail by Kubo (1989 et seq.)
   • Analysis based on native-speaker intuitions and careful impressionistic phonetics
   (a) Flat high tonal contour appears in wh-questions
       • Also in certain quantificational expressions built from wh-elements, such as
         \( \text{wh...mo} \) ‘no matter wh...’; see Kubo (1989 et seq.) for details
   (b) The H-tone span stretches between a wh-element and its [+wh] complementizer
   (c) Kubo: wh domain is one single unaccented PhP (MiP? — Kubo 2005)
   (d) What is interesting is that the wh domain can be very long, engulfing what
       would ordinarily be separate smaller PhPs in non-wh examples

(33) Notational conventions
   • wh elements and associated complementizers are marked with bold underline
   • \{\} demarcates the wh-domain — extent of high flat tone
   • \( \acute{\text{o}} \) acute accent marks a pitch accent that is realized
   • \( ^\wedge \) indicates a final rising tone

(34) Abbreviations for functional categories used in glosses

\[
\begin{array}{lllll}
\text{NOM} & \text{nominative} & \text{ACC} & \text{accusative} & \text{DAT} & \text{dative} & \text{TOP} & \text{topic} \\
\text{PRG} & \text{progressive} & \text{NEG} & \text{negative} & \text{COP} & \text{copula} & \text{NZR} & \text{nominalizer}
\end{array}
\]

(35) Fukuoka yes/no-question: Ordinary pitch accents and phrasing appear

\[
\text{Omae kyō-nen Kyōoto it-ta tó ya } {\empty^\wedge} \quad \text{(Kubo 1989)}
\]

\[
\text{you last-year Kyoto went } \text{NZR COP C}_{\text{WH}} \quad \text{‘Did you go to Kyoto last year?’}
\]
(36) Fukuoka matrix wh-question: High tone to end of matrix clause; no pitch accents

\[
\{ \text{Dare-ga} \ kyoo-nen \ kyooto \ \text{it-ta} \ to \ \text{ya} \ \emptyset ^{\wedge} \} \quad \text{(Kubo 1989)}
\]
\[
who\text{-NOM} \ last\text{-year} \ Kyoto \ \text{went} \ NZR \ COP \ C_{+WH} \quad \text{‘Who went to Kyoto last year?’}
\]

(37) Fukuoka embedded wh-question: H-tone span ends at [+wh] complementizer \(ka\); lexical accents are deleted in the wh domain, but default penultimate accent appears

\[
\{ [\text{CP Dare-ga} \ Kyooto \ ik\mu \ \text{ka}] \} \ \text{wakar\=-an} \quad \text{(Kubo 1989)}
\]
\[
who\text{-NOM} \ Kyoto \ \text{go} \ C_{+WH} \ \text{know\text{-NEG}} \quad \text{‘(I) don’t know who’s going to Kyoto.’}
\]

• Can the MSO approach account for the FJ pattern? —> Apparently not

(38) Fukuoka wh prosody is phonetically very different from Tokyo wh prosody

(a) TJ focus/wh prosody:
- salient pitch accent on the wh word
- greatly reduced pitch levels thereafter

(b) FJ wh prosody does not resemble focus intonation:
- lexical accent deletion on wh word and on subsequent items
- default accent insertion inside H-tone span
- Igarashi (2007) confirms that even focusing an unaccented NP (which is the status of a wh word at least after accent deletion has applied) does not produce a H-tone span like this
- Open question: How about a modified MSO, w/ reference to prosodic structure?
• Potential problems for the EEB approach as well?

(39) Relating syntactic constituents to PhPs in the EEB model
(a) Edge Alignment: Edges of lexical XPs —> edges of PhPs (Selkirk 1986; Chen 1987; Selkirk & Tateishi 1988, 1991)
(b) Wrap-XP: Some PhP must contain all of a lexical XP (Truckenbrodt 1999)
(c) Focus marking can also cause or block Edge Alignment and Wrap-XP effects (Nagahara 1994)

(40) FJ wh intonation does not fit these generalizations
(a) The span between a wh element and its associated complementizer (C) is a single, unaccented PhP (Kubo 1989 et seq.)
(b) The special wh-PhP overrides the usual PhP formation criteria
   • Expected PhP breaks are absent within this wh span
(c) Looks like a WRAP effect: wh element and C must be phrased together
(d) But what is being “wrapped”? Not a syntactic constituent

(41) Implication: Phrase edges, focus are not enough for the syntax/phonology interface

(42) First task: Determine whether there is accent deletion in the wh-prosody domain

4. Empirical investigation of the FJ wh contour

(43) Claim to test: Accents are deleted in a wh question in FJ
   • Four experimental conditions; 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>monò-ga (accent realized)</td>
<td>niwa-ni (no accent realized)</td>
</tr>
<tr>
<td>WH question</td>
<td>monò-ga (no accent realized)</td>
<td>niwa-ni (no accent realized)</td>
</tr>
</tbody>
</table>

(44) Participants
   • Four undergraduate students at Kyushu University (three female, one male)
   • Self-reported native speakers of FJ

(45) Materials (recorded as part of a larger set of utterances)
(a) 2 sentence sets, the “8-mora set” and the “10-mora set”
(b) 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
(c) Within each set, the sentences formed 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

(46) Sentence sets

- The critical mora is underlined (lexically accented mora, or equivalent position)

(a) 8-mora set

<table>
<thead>
<tr>
<th></th>
<th>YN-acc</th>
<th>WH-acc</th>
<th>YN-un</th>
<th>WH-un</th>
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<tbody>
<tr>
<td><strong>YN-acc</strong></td>
<td>age-na</td>
<td>monó-ga</td>
<td>yome-ga</td>
<td>dare-[+WH]-ga</td>
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<td></td>
<td>that.kind.of</td>
<td>thing-NOM</td>
<td>exist</td>
<td>who-NOM</td>
</tr>
<tr>
<td><strong>WH-acc</strong></td>
<td>doge-[+WH]-na</td>
<td>monó-ga</td>
<td>niwa-ni</td>
<td>niwa-ni</td>
</tr>
<tr>
<td></td>
<td>what.kind.of</td>
<td>thing-NOM</td>
<td>exist</td>
<td>garden-LOC</td>
</tr>
<tr>
<td><strong>YN-un</strong></td>
<td>yome-ga</td>
<td>niwa-ni</td>
<td>oru</td>
<td>oru</td>
</tr>
<tr>
<td></td>
<td>bride-NOM</td>
<td>garden-LOC</td>
<td>exist</td>
<td></td>
</tr>
<tr>
<td><strong>WH-un</strong></td>
<td>dare-[+WH]-ga</td>
<td>niwa-ni</td>
<td>oru</td>
<td>oru</td>
</tr>
<tr>
<td></td>
<td>who-NOM</td>
<td>garden-LOC</td>
<td>exist</td>
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(b) 10-mora set

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<th>YN-un</th>
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<td>age-na</td>
<td>onná-ga</td>
<td>age-na</td>
<td>doge-[+WH]-na</td>
</tr>
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<td></td>
<td>that.kind.of</td>
<td>woman-NOM</td>
<td>that.kind.of</td>
<td>what.kind.of</td>
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<td><strong>WH-acc</strong></td>
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<td></td>
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<td>garden-LOC</td>
<td>be.visible</td>
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<td>who-NOM</td>
<td>garden-LOC</td>
<td>be.visible</td>
<td>be.visible</td>
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</tbody>
</table>

Analysis 1: Pitch fall after accented mora?

(47) Measurement procedure (Praat, v. 4.6.04)

(a) The critical mora was demarcated and its mean F0 was recorded

(b) F0 measurements were also taken at these duration points:

- **100ms** and **200ms** after the right edge of the critical mora
- 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

(c) 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)
Sample utterances, with measurement points labeled

(a) YN-acc (participant 5)  \textit{age-na monó-ga aru to?}

(b) WH-acc (participant 5)  \textit{doge[+WH]-na monó-ga aru to?}

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

Results:  F0 change at 200ms

(a) Means by participant for each condition (F0 change in Hz)

<table>
<thead>
<tr>
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<th>WH-acc</th>
<th>YN-un</th>
<th>WH-un</th>
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<td>93.70</td>
<td>22.48</td>
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<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

| 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>Label</th>
<th>Num</th>
<th>Den</th>
<th>F Value</th>
<th>Pr &gt; F</th>
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</table>

(51) Utterances by individual participant

![Graphs showing F0 after 200 ms for participants P2, P3, P4, and P5](image-url)
Analysis 2: Downstep?

(52) Igarashi & Kitagawa (2007, slide 48) on FJ accent in wh questions:

- One of the two speakers showed slightly but significantly lower pitch in verb when preceded by accented words than by unaccented words (downstep was observed).
- The results may suggest that lexical accents in the post-focal domain are actually NOT deleted.
- Although further research is clearly necessary, the results may be suggestive of incomplete neutralization of the accentedness of the post-focal words.
- We can not exclude the possibility that post-focal accents actually survives.

Can their findings be replicated with these materials?

(53) Measurement procedure (Praat, v. 5.0.32)

(a) The critical mora was demarcated, as above; mean and max F0 were recorded

(b) The penultimate vowel was demarcated; mean and min F0 were recorded
  - Penultimate vowel was used because sentence-final [to] bears the final rising tone (H%) that signals a matrix question

(c) Two values were computed for each utterance:
  - F0 change, mean | mean = (Critical-mora mean F0) – (Penult V mean F0)
  - F0 change, max | min = (Critical-mora max F0) – (Penult V min F0)

(54) Predictions

(a) If wh-acc and wh-un have the same F0 change:
  - Consistent with the claim that they have the same (surface) representation
  - Evidence that accent deletion has taken place in wh-acc

(b) If the F0-change measurements show downstep in wh-acc:
  - Indication that underlying accent is present, influencing surface intonation

(55) Results: F0 change, mean | mean

- The two sentence-length conditions are distinguished in the graphs (+3μ, +4μ)
(56) **Results:** F0 change, max|min

<table>
<thead>
<tr>
<th></th>
<th>F0 before final H%</th>
<th>F0 before final H%</th>
</tr>
</thead>
<tbody>
<tr>
<td>(P2)</td>
<td><img src="image2" alt="Graph" /></td>
<td><img src="image3" alt="Graph" /></td>
</tr>
<tr>
<td>(P3)</td>
<td><img src="image4" alt="Graph" /></td>
<td><img src="image5" alt="Graph" /></td>
</tr>
<tr>
<td>(P4)</td>
<td><img src="image6" alt="Graph" /></td>
<td><img src="image7" alt="Graph" /></td>
</tr>
<tr>
<td>(P5)</td>
<td><img src="image8" alt="Graph" /></td>
<td><img src="image9" alt="Graph" /></td>
</tr>
</tbody>
</table>

(57) **Summary of downstep results:**

(a) Two participants (P2, P4) do not appear to distinguish wh-acc and wh-un

(b) Two participants (P3, P5) do appear to distinguish wh-acc and wh-un
- wh-acc items have a higher overall F0
- This does indicate a surface effect of the underlying accent
- But does not look like downstep — difference begins early, at critical μ
  - Might need embedded questions (with final L) to fully test for this
Interpretation: May be some kind of incomplete neutralization of the overall pitch contour in wh-acc items, but there is no compelling evidence that the underlying pitch accent itself (H*+L tone sequence) is realized on the surface

• Question: Would a FJ listener be able to distinguish WH-acc, WH-un?

Conclusion of empirical study

The results of this small-scale study seem to support the claim that accents are deleted in the wh intonational span

• although underlyingly accented wh utterances may show overall higher F0?

5. Theoretical implications: The wh/C phrasing condition

FJ wh intonation vs. the EEB model (repeated from above)

(a) The span between a wh element and its associated complementizer (C) is a single, unaccented PhP (Kubo 1989 et seq.)

(b) The special wh-PhP overrides the usual PhP formation criteria

• Expected PhP breaks are absent within this wh span

(c) Looks like a WRAP effect: wh element and C must be phrased together

(d) But what is being “wrapped”? Not a syntactic constituent

The wh-PhP can be structurally arbitrary

(tree structure simplified)

[CP ore-ga itu Kyoto-kara katte-kita yatuhasi-o i] omae-ga ti kutte-simoota to ya Ø

‘Which yatsuhashi did you eat, identified by when I brought them back from Kyoto?’

(lit., (*Eng) When_i did you eat the yatsuhashi [ that I brought back from Kyoto ti ] ?)

(a) Left edge of wh domain starts at wh element, wherever it is in the structure

(b) Right edge of wh domain ends at the C that is associated with the wh element
FJ is part of a larger pattern: 
**wh/C phrasing condition** (Richards 2006, slightly restated)

**Given:**
- a wh phrase $\alpha$
- a complementizer C where $\alpha$ takes scope

$\alpha$ and C must be separated by as few phonological phrase boundaries as possible, for some level of phonological phrasing

(a) In some languages, $\alpha$ moves to be closer to C  
(English)
(b) In some languages, large PhPs include both $\alpha$ and C  
(Fukuoka Japanese)

The wh/C phrasing condition connects two formerly unrelated patterns

(a) The overt/covert wh movement parameter
(b) wh-specific prosody, as in Fukuoka Japanese

- But what is the reason for this phrasing condition?
- Can it be reduced to more fundamental principles?

Today’s contribution: A more detailed look at Richards’s phrasing condition

- Proposal: Evidence from Fukuoka intonational structure (based on detailed descriptions by Kubo 1989 et seq.) that it is the C, not the wh element $\alpha$, that drives the phrasing requirement

So far, the Fukuoka examples do not determine whether the wh/C phrasing condition is driven by the C or by the wh element

- Two potentially active constraints:
  (a) $W_{\text{RAP}}$-WH  
**Every** wh element must be in the same PhP as **some** associated C
  (b) $W_{\text{RAP}}$-C  
**Every** $C_{[+\text{WH}]}$ must be in the same PhP as **some** associated wh

($W_{\text{RAP}}$ constraints — an extension of Truckenbrodt 1999)

- Examples with multiple wh elements and/or Cs clarify which constraint is active

A. Paired-list wh questions: Two wh elements, same C

- Paired-list questions in Fukuoka show that requirements originating with the wh element make little or no contribution to the wh/C phrasing condition

When two wh elements are associated with the same C: $[\text{CP} \ldots \text{wh}_1 \ldots \text{wh}_1 \ldots C_1]$

(a) A phrase break is required at left edge of second wh element (sometimes, at left edge of “constituent” (CP?) containing wh element)
(b) A wh-PhP is initiated at each wh element
(67) { **doko**₁-no daigaku-no gakusei-ga } { **nan**₁-nin ki-ta **tte**₁ ^ }  
where-GEN university-GEN student-NOM how.many.people come-PRF C.QUOT[+WH]

‘How many students came from which university, reportedly?’
  • Kubo (1989: 3) explicitly says ungrammatical without the break

(68) **W**₁**RAP-**WH (if it exists at all) must be ranked **below** the constraint that initiates a new PhP at each wh element

  \[ **ALIGN-L**(wh, PhP) \quad \text{The left edge of every wh element is aligned with the left edge of some PhP} \]

(69) **ALIGN-L**(wh, PhP) >> **W**₁**RAP-**WH

<table>
<thead>
<tr>
<th>CP doko₁ ... nan-nin₁ ... Ø₁</th>
<th>ALIGN-L(wh, PhP)</th>
<th>W₁**RAP-**WH</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) { doko₁ ... nan-nin₁ ... Ø₁ }</td>
<td>*!</td>
<td>*</td>
</tr>
<tr>
<td>(b) { doko₁ ... } { nan-nin₁ ... Ø₁ }</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

  • Consequence: **doko** is not phrased with its C because having a PhP edge at **nan-nin** is more important

B. Nested wh questions: Two wh elements and two Cs

  • Nested wh questions show that **W**₁**RAP-C**, unlike **W**₁**RAP-**WH, is active in Fukuoka

(70) When a wh chain involving the matrix C completely surrounds a wh chain involving an embedded C:  
\[ [\text{CP } \ldots \text{wh}_1 \ldots [\text{CP } \ldots \text{wh}_2 \ldots \text{C}_2 ] \ldots \text{C}_1 ] \]

  (a) Entire wh₁...C₁ span is one large wh-PhP
  (b) Crucially, there is no PhP break at wh₂

(71) { **dare**₁-ga [CP oretati-ga **doko**₂-ni iku **ka**₂ ] sit.too to ya ^ Ø₁ }  
who-NOM we-NOM where-LOC go C know:STAT NZR COP C+WH

‘Who knows where we are going?’

(72) If **ALIGN-L**(wh, PhP) >> **W**₁**RAP-**WH were the only relevant constraints, we would expect a new PhP to start at **doko** — but this is not the case

<table>
<thead>
<tr>
<th>CP dare₁ ... [CP ... doko₂ ... ka₂ ] ... Ø₁</th>
<th><strong>ALIGN-L</strong>(wh, PhP)</th>
<th><strong>W</strong>₁**RAP-**WH</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) { dare₁ ... doko₂ ... ka₂ ... Ø₁ }</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b) { dare₁ ... } { doko₂ ... ka₂ ... Ø₁ }</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>
Therefore, it is not \( \text{WRAP-WH} \) that enforces the wh/C phrasing condition in FJ, but \( \text{WRAP-C} \)

\[
\text{WRAP-C} \gg \text{ALIGN-L(wh, PhP)} \gg \text{WRAP-WH}
\]

<table>
<thead>
<tr>
<th>( \text{[CP dare}_1 \ldots [\text{CP doko}_2 \ldots \text{ka}_2] \ldots \text{Ø}_1] )</th>
<th>( \text{WRAP-C} )</th>
<th>( \text{ALIGN-L(wh, PhP)} )</th>
<th>( \text{WRAP-WH} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( (a) { \text{dare}_1 \ldots \text{doko}_2 \ldots \text{ka}_2 \ldots \text{Ø}_1 } )</td>
<td></td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>
| \( (b) \{ \text{dare}_1 \ldots \} \{ \text{doko}_2 \ldots \text{ka}_2 \ldots \text{Ø}_1 \} \) | *! | | *

- Starting a new PhP at \text{doko} is avoided because that would leave \text{C}_2 phrased with no wh element

Crucial ranking for Fukuoka: \( \text{WRAP-C} \gg \text{ALIGN-L(wh, PhP)} \gg \text{WRAP-WH} \)

- Note that there is actually no evidence here that the constraint \( \text{WRAP-WH} \) exists

Summary

(a) What makes the wh element and the \text{C} be phrased together in Fukuoka Japanese is \( \text{WRAP-C} \), not a putative \( \text{WRAP-WH} \)

\( \text{WRAP-C} \) \textbf{Every} \( \text{C}_{+[WH]} \) must be in the same PhP as \textbf{some} associated wh

(b) This means that it is the \text{C}, not the wh element, that is ultimately responsible for Richards’s (2006) wh/C phrasing condition (at least in Fukuoka Japanese)

- Needs to be explored in other languages as well

Compare the principle of “Enlightened Self-Interest” (Lasnik 1995)

Syntactic movement is driven by the requirements of the landing site rather than requirements of the moved element

- If there is only a \( \text{WRAP-C} \) constraint, and no \( \text{WRAP-WH} \) constraint, this would be a prosodic analogue of Enlightened Self-Interest

- This in turn would support Richards’s (2006) insight that wh-specific prosody and syntactic wh movement are related

6. Conclusions

The wh intonational pattern in Fukuoka Japanese, as described by Hayata (1985) and Kubo (1989 et seq.):

(a) seems to be difficult for the MSO model to account for (§3)

(b) receives empirical support from the phonetic pilot study (§4)
(c) requires the addition of something like Richards’ (2006) wh/C phrasing condition to the EEB model
  • Implication: information about wh chains is available to the syntax/phonology interface
  —> Question: What about other types of operator/variable relationships?

(d) sheds further light on the nature of the wh/C phrasing condition — the C drives the requirement

(78) Further quantitative work on this dialect has the potential to contribute significantly to our understanding of the syntax/phonology interface

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Kubo, Tomoyuki. 1989. Hukuoka-si hougen no, dare • nani tou no gimonsi o hukumu bun no pitti pataan [The pitch patterns of sentences containing WH-words in the Fukuoka City dialect]. Kokugogaku, 156, 1-12.


