Japanese Downstep Revisited

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Introduction

Downstep in Japanese

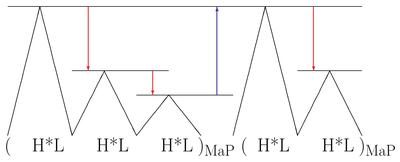
Poser (1984); Pierrehumbert and Beckman (1988); Kubozono (1993), among others:

- Downstep is triggered by H*L lexical pitch accents (i.e., Only accented words trigger Downstep).
- Major Phrase (MaP) is the domain of Downstep.

(1) (Selkirk and Tateishi, 1991, 535 (16))

a. **Downstep** (↓): Within a Major Phrase, introduce Downstep (i.e., lower the pitch register) after the first accent.

b. **Register Resetting** (↑): At the beginning of a Major Phrase, reset the pitch register.



Syntactic Boundary Blocks Downstep

- Selkirk and Tateishi (1991): Syntactic left boundaries corresponds to Major Phrase left boundaries, blocking Downstep.

(2) a. *Left-branching structure*

(A **B** **C**)MaP

Downstep: B and C

b. *Right-branching structure*

(A)MaP(**B** **C**)MaP

Reset: B; Downstep: C

Focus Blocks Downstep

- Nagahara (1994) (cf. Pierrehumbert and Beckman, 1988): The left edge of a semantically focalized phrase corresponds to a left MaP-boundary, blocking Downstep.

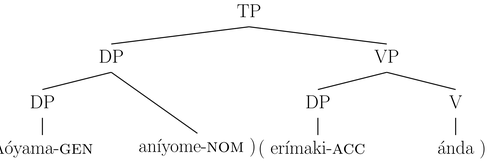
(3) *MaP rephrasing by Focus* (Nagahara, 1994, p. 42)

a. FOCUS-LEFT-EDGE (Pierrehumbert and Beckman, 1988)
Left edge of focus = left [MaP] edge

b. FOCUS-TO-END
No intervening [MaP boundary] between any focus constituent and the end of sentence.

(4) a. No Focus (= default MaP phrasing)

b. Focus on *aníyome-ga* 'sister-in-law-NOM'



a. (Aóyama-GEN aníyome-NOM)(erímaki-ACC ánda)

b. (Aóyama-GEN)(**ANÍYOME**-NOM erímaki-ACC ánda)

Questions

1. Does a syntactic boundary or a focus really block Downstep?

2. Does focus behave exactly like a syntactic boundary?

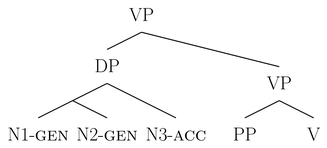
Experiment

Stimuli

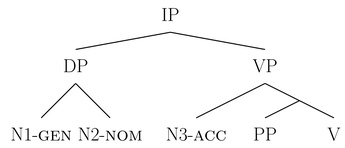
The experiment stimuli are constructed with the following 3 factors (2 × 2 × 2 design, 8 conditions):

1. **Accent on N(oun)1/N2** (*Naomi-no ane* 'Naomi's sister' vs. *Náoya-no áni* 'Naoya's brother')
2. **Focus on N3** (*wáin* 'wine' vs. *náni* 'what')
3. **Syntactic boundary between N2 and N3** ([N1 N2 N3] vs. [N1 N2] [N3])

No boundary between N2 and N3



Boundary between N2 and N3



Method

- **Subjects & Recordings:** 11 subjects (5 females and 6 males); using 6 sets of 8 conditions; recordings 3 times for each subjects
- **Data normalization:** Actual values in each subject's data are converted to normalized values relative to the reference points (R_1, R_2) according to the following formula (Truckenbrodt, 2004):

$$\text{transformed\_value} = (\text{original\_value} - R_2)/(R_1 - R_2)$$

The following two values are calculated for each subject as the reference points (R_1, R_2):

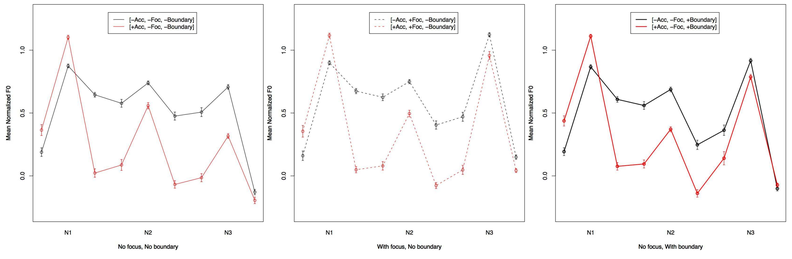
R_1 = Mean value of F_0-peak of N1
R_2 = Mean value of F_0-valley after N3

Finding 1: No Complete Reset by Boundary/Focus

(5) a. **±Accent, −Focus, −Boundary (Left):** *control condition*
[VP [DP Naomi/Náoya-no ane/áni-no wáin-o] waingúrasu-de nónda] '(I) drank Naomi's big sister's/Naoya's big brother's wine with a wineglass.'

b. **±Accent, +Focus, −Boundary (Center):** *testing the focus effect*
[VP [DP Naomi/Náoya-no ane/áni-no **náni**-o] waingúrasu-de nónda] no?
'[Naomi's big sister's/Naoya's big brother's what]$_i$ did you drink t_i with a wineglass?'

c. **±Accent, −Focus, +Boundary (Right):** *testing the boundary effect*
[DP Naomi/Náoya-no ane/áni-ga] [VP wáin-o waingúrasu-de nónda]
'Naomi's big sister/Naoya's big brother drank wine with a wineglass.'



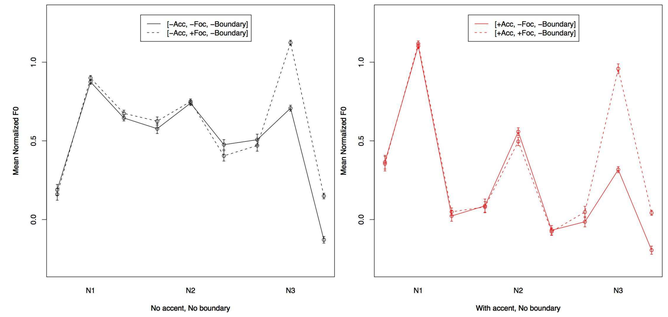
(5b) and (5c):

- Although the F_0-peak of N3 is raised strongly by focus (dotted line) and boundary (thick line), the difference between [+Accent] (**red** lines) and [−Accent] (**black** lines) remains on N3.
- **Downstep (i.e., register lowering triggered by pitch accents) is not completely reset by focus or syntactic boundary.**

Finding 2: Syntactic Boundary ≠ Focus

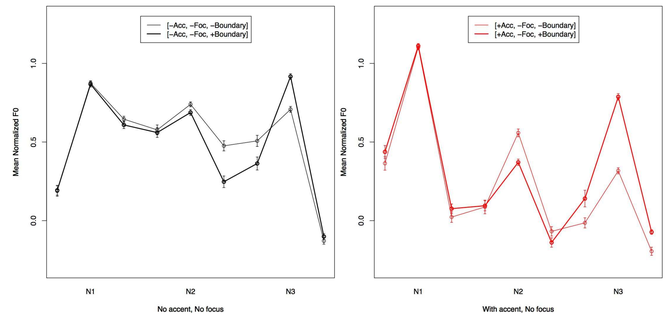
Focus

- Focus (dotted lines) only affects the F_0-peak of the focused phase (N3).



Syntactic boundary

- Syntactic boundary (thick lines), on the other hand, affects various elements.
  a. **F_0-rise of N3** in [±Accent] conditions
  b. **F_0-dip** at the boundary (between N2 and N3) in [−Accent]
  c. **Lowering of N2** in [+Acc]



- **The (partial) register reset triggered by syntactic boundary and the one triggered by focus behave differently.**

Discussion

- Downstep is only partially reset by syntactic boundaries and foci.
  – 2 domains of Downstep (within a Major Phrase and between Major Phrases)
  – Recursive models (e.g., Ladd, 1986; Féry and Truckenbrodt, 2005) seem to be on the right track.
- Focus and syntactic boundary behave differently.
  – Major Phase is derived purely by syntax.
  – Focus effect is independent of Major Phrase structure, independently affecting pitch register of the focused phrase and the post-focal material (Ishihara, 2007).

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