Linearizing Structure with Silence: The Left-Right Asymmetry in Syntax-Phonology Interface

Hisao Tokizaki
Sapporo University
toki@sapporo-u.ac.jp
http://toki.nagomix.net
Phonology Forum 2007, Sapporo

Goals
1. To show the theory of syntax-phonology mapping developed in the thesis.
2. To explore how the mapping theory explains the left-right asymmetry in syntax-phonology interface. New!

Main Proposal of the Thesis 1
Syntactic hierarchical structure is linearized with various lengths of silence between linguistic sounds.

Alice loves hamsters
[Alice [loves hamsters]]
[Alice loves hamsters]

Outline of the Thesis
1 Introduction
2 Prosodic phrasing in the minimalism
3 An alternative to the end-based theory
4 Optional phrasing and speech rates
5 Mapping and the length of constituents
6 Prosody in discourse
7 Topic/focus and phrasing
8 Semantics and phrasing
9 Derivation and parsing

This talk

End-Based Mapping (Selkirk 1986)
VP the right edge of XP

a. pa(iznize cho:mba mwa:mba) ‘he ran the vessel on to the rock’
b. ...........................................Xmax ...........Xmax

PPh: Phonological Phrase
Branching Depth (Clements 1978)

A Problem of Branching Depth:
Left-Branching Structure

1. Bare Syntax-Phonology Mapping

Interpret boundaries of syntactic constituents [...] as prosodic boundaries / ... /.

Linearization

[[Alice] [[loves] [hamsters]]]
// Alice // loves // hamsters ////

2. Boundary Deletion

Delete n boundaries between words. (n: a natural number)

Zoom-Out

a. (Alice) (loves) (hamsters)

b. (Alice) (loves hamsters)

c. (Alice) (loves) (hamsters) prosodic word

3. Consequences

Bare phrase structure
Deriving the edge parameter from the head parameter
Deconstructing prosodic hierarchy
Deriving the effects of the strict layer hypothesis
Speed of utterance
Length/heaviness of constituents
Prosodically motivated movement (Heavy NP Shift)
Given/new information
Topic/focus
Discourse structure
Derivation and parsing
4. Branching Structure Blocking Phonological Change
In Kinyambo, a High tone (´) in one word deletes the High tone in the word to its left.

a. \[ S [\text{NP abakozi} [\text{VP bákajúna}]] \rightarrow \text{abakozi workers they-helped} \]
   ‘The workers helped’

b. \[ S [\text{NP abakozi} [\text{A bakúru}]] [\text{VP bákajúna}]] \rightarrow \text{abakozi workers mature they-helped} \]
   ‘The mature workers helped.’ Bickmore (1990)

5. Left-Right Symmetry and Asymmetry
The mapping theory predicts symmetry in syntax-phonology interface.

Symmetry 1: Low Deletion in Japanese
A word-final High pitch deletes the word-initial Low pitch (‘) in the word to its right.

\[ \text{[Mòmo-to nìra-o] yôme-ni ageta.} \rightarrow \text{nìra peach-and leek-Acc daughter-to gave} \]
‘I gave peaches and leeks to my daughter in law.’

Symmetry 2: Consonant Assimilation in Korean
\(*_r\) in the word-initial position: \( r \rightarrow n \) or \( \emptyset \)
\( n-r \rightarrow r-r \) at a morpheme boundary

\[ \text{[ron ri hag -> nol-li-hak ‘logic’ argument reason study]} \]
\[ \text{[sin ri hag -> sin=nol-li-hak ‘new logic’ new argument reason study} \] (cf. Umeda 1989)
Symmetry 2: Consonant Assimilation in Korean
*<i>r</i>* in the word-initial position: *<i>r</i> -> *n* or Ø
<i>n</i>-<i>r</i> -> *r-r* (I-I) at a morpheme boundary

* *<i>ku-il-lan</i>*
<i>ku</i> <i>in</i> *<i>ran</i> -> *<i>ku</i>-<i>in</i>=*<i>nan</i>* ‘want ad column’
<i>want person column</i>  (Yutani 2005)

* *<i>si-lol-li-hak</i>*
<i>sin</i> <i>ron</i> <i>ri</i> *<i>hag</i> -> *<i>si</i>-<i>gol-li-hak</i>* ‘new logic’
<i>new argument reason study</i>  (cf. Umeda 1989)

---

Asymmetry 1: Voicing in Japanese ‘Rendaku’
nise <i>tanuki</i> -> nise <i>danuki</i> ‘mock badger’
tanuki <i>shiru</i> -> tanuki <i>jiru</i> ‘badger soup’

a.  [nise [tanuki shiru]] -> [nise [tanuki jiru]]
mock badger-soup

b.  [[nise tanuki] <i>shiru</i>] -> [[nise danuki] <i>jiru</i>]
mock-badger soup

---

Asymmetry 2: *n*-Insertion in Korean
<i>n</i> is inserted before a stem beginning in <i>i</i> or <i>y</i> when it is preceded by another stem or prefix which ends in a consonant.
a.  [kyən [yan sik]] -> [kyən [yan sik]]
light Western food

b.  [[on cʰən] yok] -> [[on cʰən] nyok]
hot spring bath

---

Markedness of Right-Branching Structure
Right-branching structure is universally marked.  (Kubozono 1993)

a.  [nise [tanuki shiru]] -> [nise [tanuki jiru]]
mock badger-soup

b.  [[nise tanuki] shiru] -> [[nise danuki] jiru]
mock-badger soup

---

Markedness of right-branching structure
Right-branching structure is universally marked for compounds (HT) (Kubozono 1993)

a.  [nise [tanuki shiru]] -> [nise [tanuki jiru]]
mock badger-soup

b.  [[nise tanuki] shiru] -> [[nise danuki] jiru]
mock-badger soup

---

The Left-Right Asymmetry in Juncture
* Right-branching structure is phrase-like; its internal juncture is long: [ ] -> /
* Left-branching structure is word-like; its internal juncture is short: ( ) -> /

John sings in the park
head-initial languages
Left-Right branching and Japanese Voicing

Right-branching compound is phrase-like; Left-branching structure is word-like.

a. \[[nise \{\{tanuki\}\} \{\{shiru\}\}] \rightarrow \[[nise \{\{tanuki\}\} \{\{jiru\}\}]\]
mock badger-soup

b. \[[\{\{nise\}\} \{\{tanuki\}\} \{\{shiru\}\}] \rightarrow \[[\{\{nise\}\} \{\{danuki\}\} \{\{jiru\}\}]\]
mock-badger soup

Left-branching structure with short juncture

The children play in my father’s aunt’s yard

a. \[[\{\{[\{The\}\} \{\{children\}\} \{\{play\}\} \{\{in\}\} \{\{my\}\} \{\{father’s\}\} \{\{aunt’s\}\} \{\{yard\}\}]\]\n
b. \[[\{\{[\{The\}\} \{\{children\}\} \{\{play\}\} \{\{in\\} \{\{my\}\} \{\{father’s\}\} \{\{aunt’s\}\} \{\{yard\}\}]\]\n
\// The // children //// play /// in /// my // father’s /// aunt’s yard

Generalizing Stress Rules

In a configuration [[C A B C]:

a. NSR: If C is a phrasal category, B is strong.

b. CSR: if C is a lexical category, B is strong iff it branches. (Liberman and Prince 1977)

Generalized Stress Rule: In [A B], B is strong iff it dominates (a) non-terminal node(s).

Branching Direction and Typology

\(\begin{align*}
&H \quad \text{Branching: left right} \\
&\text{Word order: OV VO} \\
&\text{Stress: phrase-initial phrase-final} \\
&\text{Syllable str: simple complex} \\
&\text{Rhythm: mora-count syllable-count} \\
&\text{Morphology: agglutinative inflectional}
\end{align*}\)


Conclusion

• Linearization:
Speakers map hierarchical syntactic structure onto PF with brackets and silence.

• Left-right branching asymmetry:
Left-branching structure has shorter juncture than right-branching structure.