Recursive Compounds and Word-Stress Location

Hisao Tokizaki

Sapporo University
toki@sapporo-u.ac.jp
http://toki.nagomix.net/

On Linguistic Interfaces II
December 2-4 2010, University of Ulster, Belfast

7

Proposal

◆ Recursivity of compounding in a language is determined by the canonical word-stress location.
o Left-branching compounds are syntactically-derived compounds while right-branching compounds are phrases semantically interpreted as words at LF(§1).
o Movement of complement into a specifier position changes a right-branching phrase into a left-branching compound, which has strong juncture between elements (§2).
o The canonical word-stress location corresponds to the main stress location of compounds derived from complement-movement (§3).

2

---

1. Left-branching and right-branching compounds

1.1 Right-branching compounds
1.2 Left-branching compounds
1.3 The number of heads in a recursive compound
1.4 Language-specificity
1.5 Non-restricted/restricted compounding
1.6 Two types of recursive compounds

3

1.1 Right-branching compounds

● Haider (2001): recursive compounds (complex compounds) are possible only if their structure is head-final.

(1)　a.　[baby [cat [fish]]]
　　　b.　[[[*poisson*] *chat*] (**bébé*)]
　　　　　　fish　　cat　　baby

◆ However, his examples can be considered to be phrases whose first word functions as an attributive adjective modifying the following string.

(2)　[NP [A baby] [N cat fish]] 'small catfish'
(3)　[*Import*[*riesen*[*plastik*[*garten*[*zwerg*]]]]]
　　　import giant plastic garden dwarf

4

1.2 Left-branching compounds

◆ Certain types of languages have left-branching recursive compounds.

(1)　a.　[[[waste] disposal] plan]
　　　b.　[[[towel] rack] designer]
(2)　[[[*Arbeits vertrags*] *rechts*] [*anpassungs gesetz*]]
　　　work　contract　right　adjustment　law
　　　'ajustment law for the right of work contracts'

5

1.3 The number of heads in a compound

◆ Left-branching compounds have multiple heads.

(1)　a. [[[waste] <u>disposal</u>] <u>plan</u>]　plan of disposal of waste
　　　b. [[[towel] <u>rack</u>] <u>designer</u>]　designer of racks for towel
(2)　[[[*Arbeits <u>vertrags</u>*] *<u>rechts</u>*] [*anpassungs <u>gesetz</u>*]]
　　　work　contract　right　adjustment　law
　　　'ajustment law for the right of work contracts'

◆ Right-branching compounds have one head.

(3)　[NP [A baby] [N cat <u>fish</u>]] 'small catfish'
　　　*fish for cat of baby
(4)　[*Import*[*riesen*[*plastik*[*garten*[<u>*zwerg*</u>]]]]]
　　　import giant plastic garden dwarf

6

1.4 Language-specificity

● Italian compounds are not recursive while in English, Dutch and German (i.e. Germanic languages) compounding is normally recursive (Scalise 1992: 196).

(1)　a. [[towel rack] designer]
　　　b. [[[towel rack] designer] training]
(2)　[[[*ziekte verzuim*] *bestrijdings*] *prgramma*]
　　　illness absence fight　　　　programme
　　　'programme for reducing absence due to illness'

● In Greek, only right-branching 'compounds' can be recursive (cf. Ralli 2009: 457).

(3)　[*meγal*- [*kapn*- *emboros*]]
　　　big　　tobacco merchant　'big tobacco merchant'

7

1.4 Language-specificity (contd)

◆ Left-branching compounds are language-specific.

(1)　[[[towel rack] designer] training]
(2)　[[[*ziekte verzuim*] *bestrijdings*] *programma*]
　　　illness absence fight　　　　programme
　　　'programme for reducing absence due to illness'

◆ Right-branching compounds are not language-specific.

(3)　[*meγal*- [*kapn*- *emboros*]]
　　　big　　tobacco merchant　'big tobacco merchant'
(4)　[*sala* [*dirigente capo*]]
　　　room executive chief　　　'chief-executive room'
(5)　[NP [A baby] [N cat fish]] 'small catfish'
(6)　[*Import*[*riesen*[*plastik*[*garten*[*zwerg*]]]]]
　　　import giant plastic garden dwarf

8

1.5 Non-restricted/restricted compounding

● Mukai (2008) argues that right-branching compounding is more restricted than left-branching compounding for some reason.

● Left-branching: non-restricted compounding

(1)　a. [[*kokka kooan*] *iinkai*]
　　　　　nation safety committee
　　　　'the National Public Safety Commission'
　　　b. [[theatre ticket] shop]

● Right-branching: restricted compounding

(2)　a.#[*kodomo* [*hon kurabu*]]
　　　child　　book club　'book club for children'
　　　b.#[child [book club]]　　　(# non-existent)

9

1.6 Two types of recursive compounds

example	branch	head	language-specificity	com-pounding
[baby [cat [fish]]]	right	single	non-specific	restricted
[[[waste] disposal] plan]	left	multi	specific	non-restricted

◆ Right-branching: phrase-like categories (XP)
◆ Left-branching: recursive compounds (X)

10

---

2. Derivation of recursive compounds

2.1 Derivation of right-branching compounds
2.2 Derivation of left-branching compounds
2.3 Juncture strength in branching structure
2.4 Evidence for juncture-strength asymmetry

11

2.1 Derivation of right-branching compounds

● Right-branching compounds are phrases semantically interpreted as words at LF.
(1) $[_{NP}$ $[_A$ baby] $[_N$ cat fish]] → $[_N$ $[_A$ baby] $[_N$ cat fish]]
(2) $[_{NP}$ $[_A$ *meγal-*] [*kapn- emboros*]] → $[_N$ $[_A$ ...
　　　 big　　tobacco merchant 'big tobacco merchant'
(3) $[_{NP}$ $[_N$ *sala*] [*dirigente capo*]] → $[_N$ $[_N$ ...
　　　 room executive chief　　'chief-executive room'
(4) $[_{NP}$ $[_A$ *Import*] [*riesen*[*plastik*[*garten*[*zwerg*]]]]]→$[_N$ $[_A$
　　　 import　giant　plastic　garden dwarf
(5) $[_{NP}$ $[_N$ *borsa*] $[_{PP}$ dell' [acqua calda]]] → $[_N$ $[_N$ ...
　　　 bag　　　of　　water hot
(6) a.# [*kodomo* [*hon kurabu*]] 'book club for children'
　 b.# [child [book club]]

12

2.2 Derivation of left-branching compounds

● Universal base structure: Spec-Head-Complement
◆ Left-branching compounds are real recursive compounds, in which the complement iteratively moves to the specifier position of the head
(1)　[plan [disposal [waste]]] →
　　　[plan [[*waste*] disposal]] →
　　　[[[*waste* *disposal*] plan]
◆ Silent categories and the constituent made by merging them to another constituent are invisible at PF.

13

---

plan　disposal waste　　plan waste disposal

waste disposal　plan　　waste disposal plan

14

2.3 Juncture strength in branching structure

◆ Juncture between elements in left-branching structure is stronger than that in right-branching structure (Tokizaki 2008b).

● Head Complement: $[_{XP}$ X YP] phrase
● Complement-Head: $[_X$ YP-X] (compound) word

strong juncture: (x)　　weak juncture: x

○ Juncture: the degrees of connectedness between segments of phonological representation

15

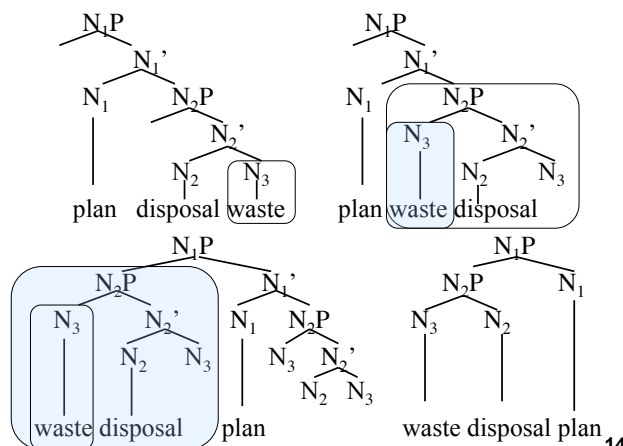## 2.4 Evidence for juncture strength asymmetry 1

○ Sequential Voicing in Japanese is blocked only in right-branching structure (Otsu 1980):
　[*nise* [*tanuki jiru*]] vs. [[*nise danuki*] *jiru*] (<*shiru*)
　mock badger-soup　　mock-badger soup
○ Similar blocking in Korean *n*-Insertion (Han 1994)
○ Interfixation in Dutch three-word compounds occurs more often at the constituent boundary in right-branching structure than left-branching structure (Krott et al. 2004):
[A intf [B C]] >> [A [B intf C]]
[[A B] intf C] > [[A intf B] C]
unmarked　　　marked

16

2.4 Evidence for juncture strength asymmetry 2

○ Suffixes attach to stems more closely than prefixes (Hyman 2008):
[prefix $[_{stem}$ ...]] vs. [[$_{stem}$ ...]-suffix]
● Quasi-incorporation in Dutch NV (Booij 2009)
a. .. *dat Jan {piano wilde spelen/wilde piano spelen}*
　　that John piano wanted play/want piano play
　　'.. that John wanted to play the piano'
b. *Jan is {piano aan het spel-en/aan het piano spel-en}*
　　John is {piano at the play-INF/at the piano play-INF}
　　'John is playing the piano'
● OV languages tend to be agglutinative (Lehmann 1973, Plank 1998, cf. Kayne 1994)

17

---

3. Stress constraint on left-branching compounds

3.1 Categories and complement-head order
3.2 Complement-head orders and stress
3.3 Stress in phrases, compounds and words
3.4 Word stress and compound stress
3.5 Complement-head compounds in leftward stress languages
3.6 Head-complement compounds in rightward stress languages
3.7 Left-branching compounds in languages with leftward stress and without stress
3.8 Problems and prospects

18

3.1 Categories and complement-head order

Head-Compl -> **Compl-Head**

a. Prefix-Stem / Stem-Suffix
   m-wia (Swa) / *debt-or*
b. Word(H)-Word(C) / Word(C)-Word(H)
   capo stazione (It) / *station-master*
c. Noun-Genitive / Genitive-Noun
   níimò ma-Kùkkú (Krongo) / *Kukku's-mother*
d. Prepostion-DP / DP-Postposition
   into rooms / *huoneese-en* (Fin)
e. Verb-Object / Object-Verb
   read books / *Bücher lesen* (Ger)
f. AdvSubordinator-Cl / Cl-AdvSubordinator
   before you go / *anata-ga iku maeni* (Jap)

19

3.2 Complement-head orders and stress

C-H\Genus	Jp/Kr	Ural	Germ	Eng	Rom	Bantu
Root-Affix	+	+	+	+	+	+−
W(C)-W(H)	+	+	+	+	−	−
Modifier-N	+	+	+−	+−	−	−
O-V	+	+	+−	−	−	−
O-Adp	+	+	−	−	−	−
Cl-Subord	+	−	−	−	−	−
Word stress	no	initial	R-ori	R-ori	R-ed	penult

Cf. Goedemans and van der Hulst (2005a, b) for word stress

20

3.3 Stress in phrases and compounds

- Assign stress to the most deeply embedded element (Cinque 1993)
  a. [John [loves [**Mary**]]]
  b. [[**waste**] disposal] plan]]
- [$_{HP}$ Head **Complement**] -> [$_{HP}$ **Complement** Head]
- [$_{\alpha P}$ α [$_{\beta P}$ β γ]] -> [$_{\alpha P}$ α [$_{\beta P}$ γ β]] -> [$_{\alpha P}$ [$_{\beta P}$ γ β] α]

21

3.4 Word stress and compound stress

- Words and compounds must have the same stress pattern in a language.
- Compounds in Germanic (R-oriented (leftward))
$$[_{Wd} \sigma \sigma \sigma \sigma] = [_{Cmp} [_C \sigma \sigma \underline{\sigma} \sigma] [_H \sigma]]$$

rack   towel ->   towel   rack

- Compounds in Romance (R-edge (rightward))
$$[_{Wd} \sigma \sigma \sigma \sigma] = [_{Cmp} [_C \sigma \sigma \underline{\sigma} \sigma] [_H \sigma \sigma]]$$

capo stazione ->   * *stazione   capo*
head station 'stationmaster'

22

3.5 Complement-head compounds in leftward stress languages

- Complement-movement derives complement-head compounds with leftward stress in leftward word-stress languages.
- Right-oriented stress (leftward) (Germanic)
(1) a. master station → státionmaster
     b. disposal waste → wáste disposal
- Initial stress (Uralic)
(2) a. *főnök állomá* → *állomásfőnök*
        boss station   station-master (Hungarian)
     b. *päällikkö asema* → *asemapäällikkö*
        master   station   station-master (Finnish)

23

3.6 Head-complement compounds in rightward stress languages

- Complement-movement cannot make complement-head compounds with leftward stress in rightward word-stress languages.
- Right-edge stress (Romance)
(1) *capo-staziónе* → *staziónecapo* (Italian)
     head station   'stationmaster'
- Penultimate stress (Bantu)
(2) *dereva teksi* → *teksi dereva* (Swahili)
     driver taxi   'taxi driver'
- Rightward stress languages make semantic compounds with head-complement order.

24

3.7 Left-branching compounds in languages with leftward stress and without stress

- Leftward stress languages (Germanic, Uralic)
(1) a. [[**waste**] disposal] plan]
     b. [[**towel**] rack] designer]
- Rightward stress languages (Romance, Bantu)
(2) a. * [[[**rifiuti**] *smaltimento*] *piano*]
        waste disposal   plan
     b. [*piano* [*di smaltimento* [*dei rifiuti*]]
        plan of disposal   of waste
- Stressless languages
(3) a. *gomi shori keikaku* (Japanese)
     b. *sseulegi cheoli gyehoeg* (Korean)
     c. *fèiwù chǔzhì jìhuà* (Chinese)

25

3.8 Problems and prospects

- Classification of recursive compounds
- Possibility of recursion in compounding
- Stress location in words and compounds
- Data of more languages
- Indonesian (two words, penult) (Cohn 1989: 188)
  [$_N$ [$_N$ *tùkaŋ*] [$_N$ *cát*]]
      artisan print 'printer'
- Vietnamese (?, tone) (Lieber 1980: 99)
  [$_N$ [$_N$ *nguòi*] [$_V$ *ở'*]]
      person be located 'servant'
- Prominence location in tone languages

26

Conclusion

- Recursivity of compounding in a language is determined by the canonical word-stress location.
- Left-branching compounds are syntactically-derived compounds while right-branching compounds are phrases semantically interpreted as words at LF (§1).
- Movement of complement into a specifier position changes a right-branching phrase into a left-branching compound, which has strong juncture between elements (§2).
- The canonical word-stress location corresponds to the main stress location of compounds derived from complement-movement (§3).

27

References

Baroni, Marco, E miliano Guevara and Roberto Zamparelli. 2007. Italian deverbal compounds: Words, phrases or either? Paper presented at 33esimo Incontro di Grammatica Generativa, University of Bologna.

Bauer, Laurie. 2009. Typology of compounds. In Rochelle Lieber and Pavol Štekauer (eds.), 343-356.

Booij, Geert. 2009. A constructional analysis of quasi-incorporation in Dutch. *Gengo Kenkyu* 135, 5-27.

Cinque, Guglielmo. 1993. A null theory of phrase and compound Stress. *Linguistic Inquiry* 24, 239-298.

Cohn, Abigail C. 1989. Stress in Indonesian and bracketing paradoxes. *Natural Language and Linguistic Theory* 7, 167-216.

Dryer, Matthew. 2005. Order of adverbial subordinator and clause. In Martin Haspelmath, Matthew S. Dryer, David Gil and Bernard Comrie (eds.) *The world atlas of language structures*, Oxford: Oxford University Press, .

Goedemans, Rob and Harry van der Hulst. 2005. Weight-sensitive stress. In Martin Haspelmath, Matthew S. Dryer, David Gil and Bernard Comrie (eds.) *The world atlas of language structures*, Oxford: Oxford University Press, 66-69.

Haider, Hubert. 2001. Why are there no complex head-initial compounds? In Ch. Schaner-Wolles, J. Rennison and F. Neubart (eds.) *Naturally!: Linguistic studies in honour of Wolfgang Ulrich Dressler presented on the occasion of his 60th birthday*. Torino: Rosenberg & Sellier, 165-174.

Han, Eunjoo. 1994. *Prosodic Structure in Compounds*. Doctoral dissertation, Stanford University.

Haspelmath, Martin, Matthew S. Dryer, David Gil and Bernard Comrie. 2005. *The world atlas of language structures*. Oxford: Oxford University Press.

Hyman, Larry M. 2008. Directional asymmetry in the morphology and phonology of words, with special reference to Bantu. *Linguistics* 46, 309-350.

Kayne, Richard S. 1994. *Antisymmetry in syntax*. MIT Press.

Kösling, Kristina, and Ingo Plag. 2009. Does branching direction determine prominence assignment? An empirical investigation of triconstituent compounds in English. *Corpus Linguistics and Linguistic Theory* 5, 205-243.

Krott, Andrea, Gary Libben, Gonia Jarema, Wolfgang Dressler, Robert Schreuder, and Harald Baaven. 2004. Probability in the grammar of German and Dutch: Interfixation in triconsonstituent compounds. *Language and Speech* 47, 83-106.

Lehmann, Winfred P. 1973. A structural principle of language and its implications. *Language* 49, 47-66.

Lieber, Rochelle. 1980. On the organization of the lexicon. Doctoral dissertation, MIT.

Lieber, Rochelle and Pavol Štekauer (eds.) 2009. *The Oxford handbook of compounding*. Oxford University Press.

Mukai, Makiko 2006. A comparative study of compound words in English, Japanese, and Mainland Scandinavian. Doctoral dissertation. University of Newcastle.

Mukai, Makiko. 2008. Recursive compounds. *Word Structure* 1, 178-198.

Namiki, Takayasu. 2002. Go-o tsukuru shikumi: Keitairon I (Word-formation system: Morphology I). In Yukio Otsu et al. (eds.) *Gengo-kenkyu-nyumon* (An introduction to the study of language). Tokyo: Kenkyusha, 76-88.

Otsu, Yukio. 1980. Some aspects of *rendaku* in Japanese and related problems. *Theoretical issues in Japanese linguistics (MIT Working Papers in Linguistics 2)*, ed. Yukio Otsu and Ann Farmer, 207-236.

Plank, Frans. 1998. The co-variation of phonology with morphology and syntax: A hopeful history. *Linguistic Typology* 2, 195-230.

Ralli, Angela. 2009. IE, Hellenic: Modern Greek. In Rochelle Lieber and Pavol Štekauer (eds.) *The Oxford handbook of compounding*. Oxford: Oxford University Press, 453-463.

Scalise, Sergio. 1992. Compounding in Italian. *Rivista di Linguistica* 4, 175-199.

Selkirk, Elisabeth. 1982. *The syntax of words*. Cambridge, MA: MIT Press.

Szymanek, Bogdan. 2009. IE, Slavonic: Polish. In Rochelle Lieber and Pavol Štekauer (eds.), 464-477.

Tokizaki, Hisao. 2008a. *Syntactic structure and silence: A minimalist theory of syntax-phonology interface*, Tokyo: Hitsuji Syobo.

Tokizaki, Hisao. 2008b. Symmetry and asymmetry in the syntax-phonology interface. *Phonological Studies* 11, 123-130.

Tokizaki, Hisao and Yasutomo Kuwana. 2010. A stress-based theory of disharmonic word orders. To appear in Theresa Biberauer and Michelle Sheehan (eds.) *Theoretical approaches to disharmonic word orders*. Oxford: Oxford University Press.

Wagner, Michael. 2005. Asymmetries in prosodic domain formation. *MIT Working Papers in Linguistics* 49, 329-367.

Wagner, Michael. 2010. Prosody and recursion in coordinate structures and beyond. *Natural Languag*Biberauer, Theresa, Anders Holmberg and Ian Roberts. 2008. Structure and linearization in disharmonic word orders. *WCCFL 26*, 96-104.