

Prosody and Head-directionality in Chinese

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1. Head-Complement orders in Chinese

1.1 Head-initial and head-final orders 1

- **Head-Complement (H-C) (1a)**
- modal-V: *hui nian*
will read
- negative-V: *meiyou nian*
not read
- preposition-NP: *yong shou*
with hand
- V-O: *nian shu*
read books

4

1.2 Disharmonic orders and parameter 2

- Travis 1984, Li 1990
- Chinese is generally head-final except that at most one NP may follow a verb or a preposition.
- *The Chinese Word Order Constraint*
 - a. Chinese is head-final except under the requirements of Case assignment.
 - b. Case is assigned from left to right in Chinese.
 - c. A Case assigner assigns at most one Case.
- cf. Huang 1994

7

Proposal

- Chinese is disharmonic in its head-directionality because tones on lexical items function as an output condition on the movement of complement to the specifier position.
- Chinese word order supports the idea that head-directionality is universally determined by prosodic strength realized as stress or tone.
- This is a step toward the hypothesis universal syntax and parametric phonology (USPP)

2

1.1 Head-initial and head-final orders 2

- **Complement-Head (C-H) (1b)**
- stem-affix: *pengyou-men*
friend-people
- NP-postposition: *pengyou de*
friend De
- V-aspect: *lai le*
come Perf
- clause-Q particle: *ni lei ma?*
you tired Q
- modifier-N: *pengyou de fangzi*
friend De house
- degree word-A: *hen hao*
very good
- PP-V: *cong Zhongguo lai le*
from China come Perf
- [ba-NP]-V: *ba shi zuo hao*
Ba thing do well

5

2. Roll-up movement deriving Complement-Head orders and the Final-Over-Final Constraint

2.1 Complement movement

- Kayne (1994) argues that consistent C-H order is derived from H-C order by cyclic movement of complement to the specifier position, as in (2) (cf. Abels and Neeleman 2012).
- (2) ... X [_{YP} ... Y ZP] ... →
 ... X [_{YP} ZP Y t] ... →
 ... [_{YP} ZP Y t_{ZP}] X t_{YP}

8

Road map

1. Head-Complement orders in Chinese
2. Roll-up movement deriving Complement-Head orders and the Final-Over-Final Constraint
3. Roll-up movement constrained by prosodic patterns
4. Some consequences: universal syntax and parametric phonology (USPP)

3

1.2 Disharmonic orders and parameter 1

- Disharmonic orders in Chinese: a challenge to the principles and parameter theory (Huang 1982, 1994, Travis 1984, Li, Y. 1990)
- Huang 1982: 41
- The X'-structure of the Chinese of the form
 - a. [$x^n X^{n-1} YP^*$] iff $n = 1, X \neq N$
 - b. [$x^n YP^* X^{n-1}$] otherwise
 X' refers to X and its subcategorized complements (N/V/A/P and their subcategorized complements). YP* means more than one YP is allowed.

6

2.2 the Final-Over-Final Constraint (FOFC)

- Assuming this roll-up movement, Biberauer et al. (2008) propose the Final-Over-Final Constraint (FOFC) in (3), which prohibits complement movement from skipping cycles.
- (3) * [_{βP} [_{αP} α YP] β], where αP is the complement of β and YP is the complement of α.
 FOFC correctly rules out the word orders that are absent or rare in the world's languages:
- * [_{IP} [_{VP} V O] Aux]
 - * [_{CP} ... [_{VP} V O] C]

9

2.3 Chinese violates FOFC

- However, FOFC wrongly rules out a number of well-formed constructions in Chinese listed in (4).
- (4) a. clause-Q particle orders: $[_{CP} \dots [_{VP} V NP] C]$
ni neng xie Zhongguo zi ma?
 you can write Chinese character Q
 'Can you write Chinese characters?'
- b. prepositional phrase-V: $[_{VP} [_{PP} P NP] V]$
cong Zhongguo lai le
 from China come Perf
 'come from China'
- c. relative clause-N: $[_{NP} [_{VP} V O] de N]$
qi zixingche de ren
 ride bicycle De person
 'people who ride bicycles'

10

3.3 Well-formed pattern

- Complements in head-complement sequences in (1a) keep their citation tone in the case of sandhi (e.g. third-tone sandhi in Mandarin).
 - Heads in (1a) (modal, negative, preposition, V) have non-neutral tone, which may change into another tone in sandhi.
 - This is a well-formed pattern since the citation tone of the complement is kept unchanged and heads still have non-neutral tone.
- hui nian meiyou nian yong shou nian shu*
 will read not read with hand read books

13

3.5 Left-stress 1

- Complements in complement-head order in (1b) keep their tone by Left-Stress (5b).
 - Heads in (1b) are divided into two categories: clitics (affix, aspect, postposition, Q particle) and lexical words (N, A, V).
 - Clitics have neutral tone and conform to Left-Stress (5b).
- (5) b. $(_{P_{wd}} T N)$ Pwd: prosodic word, T: tone, N: neutral/light tone

16

3. Prosodic constraint on movement

3.1 Prosodic patterns in Chinese

- Instead of assuming FOFC, I propose that Chinese C-H orders in (1b) are derived from H-C in the base if the derived structure observes the prosodic patterns in Chinese, as shown in (5).
- (5) a. $(_{TD} W \dots W S)$ TD: tonal/sandhi domain, W: weak position, S: strong position
- b. $(_{P_{wd}} T N)$ Pwd: prosodic word, T: tone, N: neutral/light tone
- Right-Tone (5a) is the original Chinese pattern while Left-Stress (5b) is a system borrowed from Altaic languages. This mixed prosodic system makes Chinese word orders disharmonic.

11

3.4 Ill-formed pattern 1

- If the order was reversed by complement movement, the resulting complement-head structure would need to have Left-Stress (5b) in order to keep complement prominent. However, neutral tone on the right in (5b) would conflict with the fact that these heads have non-neutral tone. Thus, complement movement does not apply to (1a) even in (4).

14

3.5' Left-stress 2

- (5) b. $(_{P_{wd}} T N)$ Pwd: prosodic word, T: tone, N: neutral/light tone
- stem-affix: *pengyou-men*
 friend-people
 - NP-postposition: *pengyou de*
 friend De
 - V-aspect: *lai le*
 come Perf
 - clause-Q particle: *ni lei ma?*
 you tired Q

17

3.2 Complement prominence

- Following the idea of Complement Prominence (Nespor and Vogel (1986) and Cinque's (1993)), I argue that complement must be linearized in the strong position where citation tone is preserved (Right-Tone) and not neutralized (Left-Stress).

head	complement
weak pos.	strong position
tone changed	tone preserved

complement	head
strong position	weak pos.
tone preserved	neutral tone

12

3.4' Ill-formed pattern 2

- If Chinese applied roll-up complement movement to satisfy FOFC, the resulting phrase would not conform to Chinese prosodic patterns.
- (4') a. clause-Q particle orders: $*[_{CP} \dots [_{VP} NP V] C]$
 * *ni Zhongguo zi xie ma?*
 you Chinese character write Q
 'Do you write Chinese characters?'
- b. postpositional phrase-V: $*[_{VP} [_{PP} NP P] V]$
 * *Zhongguo cong lai le*
 China from come Perf
 'come from China'
- c. relative clause-N: $*[_{NP} [_{VP} O V] de N]$
 * *zixingche qi de ren*
 bicycle ride De person
 'people who ride bicycles'

15

3.6 Lexical heads and boundary 1

- On the other hand, lexical heads have tone and do not conform to (5b) $(_{P_{wd}} T N)$.
- However, they can be separated from the preceding complement by a prosodic boundary in order to keep their tone.
- Thus, complement movement applies to these constituents to derive complement-head order.

18

3.6' Lexical heads and boundary 2

- * modifier-N: *pengyou de # fangzi*
friend De house
- * PP-V: *cong Zhongguo # lai le*
from China come Perf
- * [ba-NP]-V: *ba shi # zuo hao*
Ba thing do well
 - * *ba ren da*
Ba people hit
 - * *ba ta dadao*
Ba him overthrow
 - * *ba shi zuo hao*
Ba thing do well
- * degree word-A: *hen hao*
very good

19

Languages in East Asia

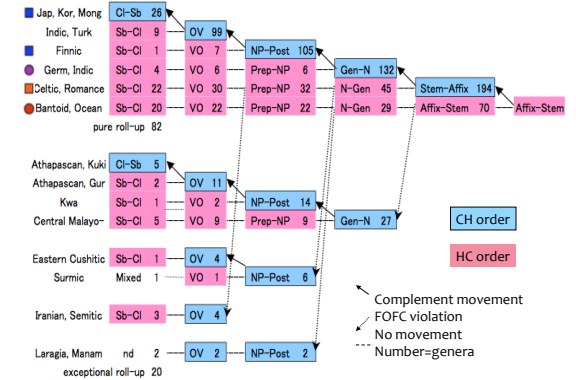


Language	tone	Coda	Word orders
Manchu	0	n/rj	AN NP OV CS
Gansu	3	n/rj	
Beijing	4	n/rj	GN AN PN VO
Nanshang	6	n/rj/t/k	
Guangzhou	8 (9)	m/n/rj/p/t/k	GN AN/NA PN VO Mix
Thai	8	m/n/rj/p/t/k	NG NA PN VO SC

Hashimoto (1981): Languages in East Asia have a gradational variation of tone complexity and coda inventory.

Tokizaki and Kuwana (2011): These languages also have a gradational variation of syntactic head-complement orders (C-H/H-C) (Adj-N, N-PostP, Clause-Subordinator.)

22



25

4. Summary and consequences

4.1 Summary

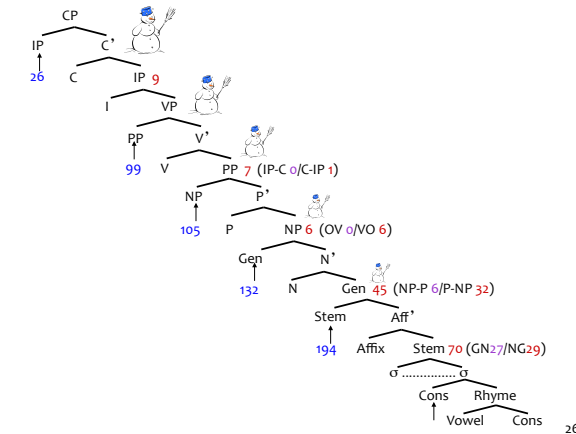
- * To sum, head-complement orders are determined by universal Complement Prominence and language particular prosody in (5) in Chinese.
- * This study has a number of consequences in diachronic and dialectal linguistics and the architecture of grammar.

20

4.3 Word stress and word orders

- * Tokizaki (2011) argues that word-stress location decides head-complement orders in stress languages in the world.
- * Then, disharmonic head-complement orders are no longer a problem for the minimalist program in that an output condition decides linearization of hierarchical structure.

23



26

4.2 Variation

- * As Hashimoto (1978) argues, classical Chinese and southern Chinese dialects have more tonal characters and more head-complement orders than present day Chinese and northern dialects.
- * These correlated changes and variations are explained straightforwardly with the prosody-based theory of word orders presented here.
- * Northern dialects: (5) b. $(_{P_{wd}} T N)$ stress C-H
- * Southern dialects: (5) a. $(_{T_D} W \dots W S)$ tone H-C

21

Stress and head-complement orders

	Jap/Kor	Ural	Ger	Eng	Rom	Bantu
a. Stem-Affix	+	+	+	+	+	+-
b. Wrđ (C)-Wrđ (H)	+	+	+	+	-	-
c. Modifier-Noun	+	+	+	+	-	-
d. Object-Adp	+	+	+-	-	-	-
e. Object-Verb	+	+	+-	-	-	-
f. Clause-Subord	+	-	-	-	-	-
g. Word-Stress	No/Initial	Initial	R-ori	R-ori	R-ed	Penult

As the stress moves leftward, complement-head orders increase.

24

Conclusion

- * To sum, head-complement orders are determined by universal Complement Prominence and language particular prosody in (5) in Chinese.
- * This study has a number of consequences in diachronic and dialectal linguistics and the architecture of grammar.
- * The idea of Universal Syntax and Parametric Phonology (USPP) does away with head parameter in syntax (Feng 2002, Kayne 2011).

27

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