

## Head parameter and the prosody in Chinese

Within the Principles and Parameters framework, the head directionality parameter (or the head parameter) was assumed to decide the word order between head and complement together with X-bar schema in syntax. One of the great contributions by Lisa Travis to the study of parameters is that she succeeded in explaining the word order variation in Chinese in terms of the head parameter together with the directionality of Case assignment and theta-role assignment (Travis 1987, cf. Song 2012). Although her system straightforwardly explains a wide range of Chinese data, it is not clear whether her idea is still tenable in the current view of the Minimalist Program (MP, Chomsky 1995), which assumes the minimal computational system in syntax without directionality. The next step we should take is to how her ideas can be recaptured in the MP with the idea of Externalization parameter (Chomsky 2017).

In this paper, I argue that the order between head and complement in Chinese is decided by the prosody of words and phrases. I argue that a constituent, which has no linear order in syntax, is linearized at Externalization according to the prosody of the language or the dialect, which varies among languages and dialects and may change diachronically. If we use Uriagereka (1999)'s metaphor of a Calder's mobile as linearization, a mobile (a constituent) is put on the desk of a specific shape (prosody) rather than on the ground as Uriagereka claims.

Chinese is disharmonic in word order in that it has both head-initial order as in (1) and head-final order as shown in (2) and (3).

- |     |    |                         |                              |                                    |
|-----|----|-------------------------|------------------------------|------------------------------------|
| (1) | a. | [IP modal VP]           | <i>děi zǒu</i>               | ‘must go’                          |
|     | b. | [NegP negative VP]      | <i>méiyǒu xiě</i>            | ‘(did) not write’                  |
|     | c. | [PP P NP] (prep.-NP)    | <i>wǎng nǎr</i>              | ‘to where’                         |
|     | d. | [VP V NP] (V-O)         | <i>mǎi jiǔ</i>               | ‘buy alcohol’                      |
| (2) | a. | [Word stem affix]       | <i>péngyou-men</i>           | ‘friend-people’                    |
|     | b. | [PP NP P] (NP-postp.)   | <i>péngyou de</i>            | ‘friend DE (friend’s)’             |
|     | c. | [AspP VP aspect]        | <i>lái le</i>                | ‘come PERF (came)’                 |
|     | d. | [CP IP Q] (cl.-Q part.) | <i>nǐ lèi ma?</i>            | ‘you tired Q (Are you tired?)’     |
| (3) | a. | [NP modifier N]         | <i>péngyou de fǎngzi</i>     | ‘friend DE house (friend’s house)’ |
|     | b. | [VP PP V]               | <i>cóng Zhōngguó pǎo lái</i> | ‘from China come PERF (came)’      |
|     | c. | [VP [ba-NP] V]          | <i>bǎ shì zuò hǎo</i>        | ‘BA thing do well (do things)’     |

I argue that a tonal domain of Chinese has the prosody shown in (2), where T represents a tone, CT a citation tone (the most prominent tone in the tonal domain); an asterisk represents that the T or the N can be recursive.

- (4) [TD (T\*) CT (N\*)] (= [TD T CT], [TD CT N], [TD T T CT], [TD CT N N], [TD T CT N], ..)

Now we can explain the head-initial order in (1) by claiming that the constituents in (1a-d) must have the head-initial order in order to put the prominence to the complement (i.e. the most deeply embedded element, cf. Cinque 1993), which keeps its citation tone. These constituents have the prosodic pattern T\* CT shown in (4) and acceptable. In (1) the third tone (low) of the head is on the weak position and is changed into the second tone (rising) by the third tone sandhi (e.g. *děi zǒu* > *déi zǒu*). If it was linearized in the head-final order, the citation tone of the complement would be lost (e.g. *zǒu děi* > *zóu děi*) and is filtered out at the Externalization.

The head-final order in (2) is explained by the fact that the head in (2) is a function word, which has a neutral tone (or light tone) without stress. Thus, the phrase in (2) has CT (N\*) pattern shown in (4) (e.g. *lái le*). In other words, the difference between head-initial order in (1) and the head-final order in (2) is explained by the distinction between content words with a tone and function words without a tone.

This idea leaves the question why the head-final order in (3) is acceptable even though the head is a content word. An answer is that the final N or V in (3) is informationally heavier than the preceding phrase and makes a tonal domain by itself. Thus, the prosody of (3a-c) is in fact [TD modifier] [TD N], [TD PP] [TD V], and [TD *ba*-NP] [TD V]. This analysis is supported by the fact that in (3b) and (3c) the V must be followed by another word (*lai* and *hao*) to make the final position heavy (\**cóng Zhōngguó pǎo*, \**bǎ shì zuò*) (cf. Duanmu 2007).

Thus, we can derive the order of a head and its complement without the directionality of Case assignment and theta-role assignment. Note that this idea of prosodic linearization does not need any syntactic movement to derive the head-final order (cf. Biberauer, Holmberg and Roberts 2016, Sheehan et al. 2017). We can explain a word order, which is problematic for the Final-Over-Final Constraint in terms of prosody, shown in (5).

(5) [CP [IP *nǐ néng* [VP *xiě hànzi*]] *ma*?  
 you can write Chinese character Q ‘Can you write Chinese characters?’

Here, the VP is head-initial and is dominated by the head-final CP whose head is *ma*. This would be a counterexample unless some categorical distinction is made between this Q and the other Cs as BHR (2016) assume. The analysis presented here explains the acceptability of (5) straightforwardly because the entire sentence has the prosody T\* CT N shown in (4) because the final *ma* is a function word and is pronounced with a neutral tone at the end of the tonal domain. Note that the unacceptability of the example \*[VP [PP *cóng Zhōngguó*] *pǎo*] is also explained by this prosodic analysis as well as the Final-Over-Final Constraint: *pǎo*, which is not a function word, neither can attach to the preceding word nor can make a tonal domain by itself.

It is also interesting to extend this analysis to other languages with disharmonic word order such as German and Dutch, which allows unstressed prefix (a mirror image of Chinese unstressed suffix, cf. Nespor et al. 1996). Although we still need to explain the dialectal variation and the historical change of word order in Chinese, which Travis (1987) succeeded to explain in terms of the directionality in syntax (cf. Hashimoto’s (1978) prosodic analysis), this analysis suggests a promising way to explain word order phenomena in the Minimalist Program.

### References

- Biberauer, Theresa, Anders Holmberg and Ian Roberts. 2014. A Syntactic universal and its consequences, *Linguistic Inquiry* 45, 169–225.
- Chomsky, Noam. 1995. *The minimalist program*. MIT Press.
- Chomsky, Noam. 2017. Notes on parameters. *Linguistic Analysis* 41, 475-479.
- Cinque, G. 1993. A null theory of phrase and compound stress. *Linguistic Inquiry* 24: 239-298.
- Duanmu, San. 2007. *The phonology of Standard Chinese*, 2nd edn. Oxford University Press.
- Hashimoto, Mantaro. 1978. *Gengo ruikei chiri-ron* [Geographical Linguistic Typology]. Tokyo: Kobundo.
- Nespor, Marina, Maria Teresa Guasti and Anne Christophe. 1996. Selecting word order: The rhythmic activation principle. In Ursula Kleinhenz (ed.), *Interfaces in phonology*, 1–26. Berlin: Akademie Verlag.
- Michelle Sheehan, Theresa Biberauer, Ian Roberts, and Anders Holmberg. 2017. *The Final-Over-Final Condition: A syntactic universal*. MIT Press.
- Song, Jae Jung. 2012. *Word order*. Cambridge: Cambridge University Press.
- Travis, Lisa deMena. 1984. Parameters and effects of word order variation. MIT dissertation.
- Uriagereka, Juan. 1999. Multiple Spell Out. *Working Minimalism*, ed. by Samuel David Epstein and Norbert Hornstein, 251–282. Cambridge, MA: MIT Press.