



Puzzles about Chinese nominal complexes: A Head-Function Approach

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Introduction

The topics:

- ▶ structure of nominal complexes (NC \approx NP/DP) in Mandarin Chinese (MC)
- ▶ combination of “specifying elements” (DEM, Mods, CL) with the head N

The broader picture:

- ▶ cross-linguistic consequences for NC structure (cf. NP/DP Parameter)
- ▶ structural consequences for NP-DP debate

HPSG:

(cf. Pollard & Sag 1987, 1994; Müller & Machicao y Priemer 2019)

- ▶ deeply formalised constraint-based framework
- ▶ declarative, i.e. non-derivational (no “movement”)
- ▶ lexicalist approach: constraints on affixes, words, phrases are stored in an organised lexicon
- ▶ organisation of lexicon: inheritance hierarchy (generalisations)



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Complexity

As it is well known, NCs in MC can appear in argument positions **with or without a demonstrative (DEM) or a classifier (CL)**:

- (1) a. wo mai-le shu.
I bought-PFV book
'I bought {a/the book / ∅/the books}.'
- b. wo mai-le san ben shu.
1.SG buy-PFV three CL book
'I bought three books.'
- c. wo mai-le na shu.
1.SG buy-PFV DEM book
'I bought that book.'
- d. wo mai-le na san ben shu.
1.SG buy-PFV DEM three CL book
'I bought those three books.'

(cf. Cheng & Sybesma 1999; Chierchia 1998; Huang et al. 2009)

Q1: account for bare and complex NCs



Combinatorics

Similar to specifiers (different from modifiers),
DEM and CL **cannot be iterated (2b)**.

(We limit ourselves to sortal and measure classifiers excluding kind classifiers,
cf. Chao 1968; Liao & Wang 2011; Her 2012; Zhang 2011.)

- (2) a. na da de san ben guanyu yuyanxue de shu
DEM big DE three CL about linguistics DE book
'those three big books about linguistics'
- b. *na san xiang zhe liang ben shu
DEM three CL DEM two CL book
Intended: 'those three boxes of two books'

But the **combination** of DEM and CL is possible (2a).
That is, **not only one** of these elements is (possibly) "selected"
(like modifiers, unlike specifiers).

Q2: What is the function of DEM and CL? How are they combined with N?



Modifiers

Modifiers in MC can appear in **different positions** within NCs,
and reveal much about NC structure.

(We limit ourselves to phrasal modifiers, cf. Paul 2005; Sun 2015,
for a semantic distinction between lexical and phrasal modification, see Bücking 2009)

- (3) a. na san ben da de shu
DEM three CL big DE book
- b. na da de san ben shu
DEM big DE three CL book
- c. da de na san ben shu
big DE DEM three CL book
'those three big books'
- d. *na san da de ben shu
DEM three big DE CL book
Intended: 'those three big books'

It is not possible to **separate** NUM **from** CL.

Q3: account for strong connection between NUM + CL



Classifiers and Modifiers

Considering sortal and measure classifiers (CL_s, CL_m),
CL_m **allow modification**,
CL_s **do not allow modification**.

CL_m leads to different interpretations (4b).

- (4) a. wo mai-le [da de na san ben shu].
1.SG buy-PFV big DE DEM three CL_s book
'I bought those three big books.'
- b. wo mai-le [da de na san xiang shu].
1.SG buy-PFV big DE DEM three CL_m ≈ 'box' book
'I bought those three big boxes of books.' or
'I bought three boxes of those big books.' or
'I bought those three boxes of big books.'
Not possible: 'I bought three big boxes of those books.'

Q4: account for the different interpretations according to the CL subtypes



Ambiguities with CL_m

CL_m have lexical meaning that “**can be modified**”, and offer therefore **further** potential **positions** to attach modifiers.

- (5) a. *sanjiaoxing de na fangfangzhengzheng de san ge shupian.
 triangular DE dem square DE three CL_s chip
 Intended: ‘those triangular square chips.’
- b. sanjiaoxing de na fangfangzhengzheng de san xiang shupian.
 triangular DE DEM square DE three CL_m ≈ ‘box’ chip
 ‘those three square boxes of triangular chips.’

Q5: account for the different structures according to the CL subtypes



Number

Depending on the combination of DEM, NUM, CL, Mod and N, the NC can be interpreted either only as **sg.** or as **number neutral** (sg or pl).

- (6) a. wo mai-le shu.
 I bought-PFV book
 ‘I bought {a/the book / ∅/the books}.’ bare N: sg/pl
- b. wo mai-le nei shu.
 1.SG buy-PFV DEM book
 ‘I bought that book.’ DEM+N: sg
- c. wo mai-le na san ben shu.
 1.SG buy-PFV DEM three CL book
 ‘I bought those three books.’ DEM+NUM+CL+N: pl
- d. wo mai-le na da de shu.
 1.SG buy-PFV DEM big DE book
 ‘I bought {that big book / those big books}.’ DEM+Mod+N: sg/pl

Q6: account for singular–plural asymmetry



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Head-Function Approach (HFA)

The HFA was proposed (Allegranza 1998, 2007; Van Eynde 2006, 2020, 2021)

- ▶ to deal with the fact, that some determiners share characteristics with **lexical parts of speech**, such as nouns and adjectives;

(7) {the / we / many} linguists

- ▶ to deal with the similarity in syntactic structure between **specifiers** and **modifiers**;
- ▶ **specifiers** “add” some information to the nominal projection (e.g. expression of quantity)

(8) several books

- ▶ **modifiers** “add” some information to the nominal projection (e.g. expression of size)

(9) big books

- ▶ to ensure **locality** and **endocentricity** within NPs

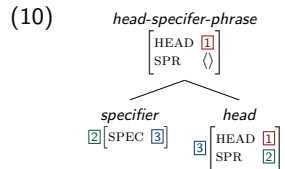
→ N is the head, DET or Mod is a functor

(Chomsky 2007; Chomsky et al. 2019; Bruening 2009, 2020
 Machicao y Priemer & Müller 2021)



MC and *head-specifier-phrase*

- ▶ In a *head-specifier-phrase* a head selects an element in it's specifier list.
- ▶ Problem in MC: CL, DEM, MOD, or nothing can combine with N
→ multiple lexical items with the possible combinatorial variants

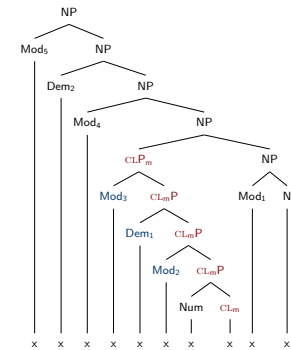


- (11) wo mai-le **shu**.
'I bought {a/the book / ∅/the books}.' bare N: sg/pl
- (12) wo mai-le **san ben shu**.
'I bought three books.' NUM+CL+N: pl
- (13) wo mai-le **na san ben shu**.
'I bought those three books.' DEM+NUM+CL+N: pl



HFA can account for the following facts:

- ▶ **Bare nouns** can be used as arguments.
→ CL and DEM are not needed to complete the NP.
- ▶ Similar prenominal **distribution** of CL, DEM, and MOD
→ CL, DEM, and MOD have some similarities
- ▶ There are also **differences** between MOD and CL or DEM
(e.g. w.r.t. iteration)
- ▶ When a DEM appears inside the CLP, there **cannot be another** DEM attaching to the NP.



Head Feature Principle (HFP)

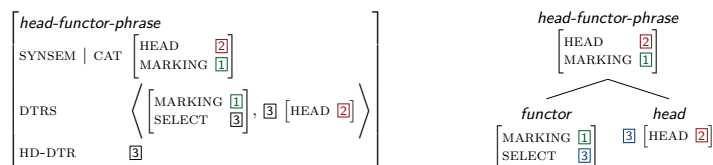
In a phrase of type *headed-phrase*, the HEAD value of the **mother** (2) is identical to that of its **head daughter**.

Selector Principle (SP)

In a phrase of type *head-functor-phrase*, the SELECT value of the **non-head daughter** (3) is required to be identical to the SYNSEM value of the **head daughter**.

Generalized Marking Principle (GMP)

In a phrase of type *head-functor-phrase*, the MARKING value of the **mother** (1) is identical to that of its **non-head daughter**.



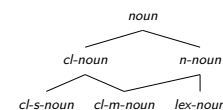
(cf. Pollard & Sag 1994; Van Eynde 2006, 2021)



MC & HFA

Due to the different **positions** and **interpretations** of **modifiers**, according to the subtypes of CL (CL_s vs. CL_m), we assume that N and CL build a **“natural class”** that can be subdivided.

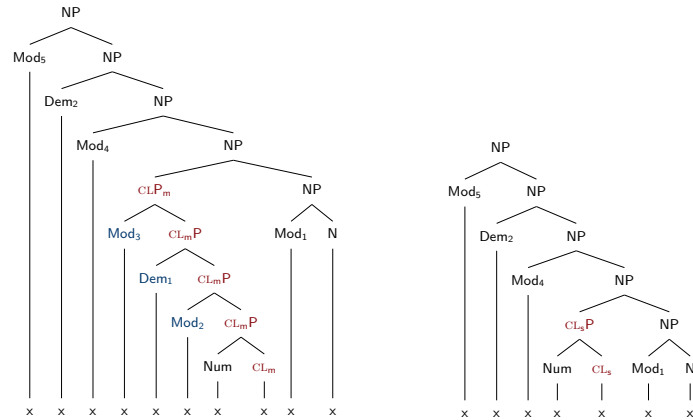
(14) Hierarchy of nominal HEAD Values



Phrasal modifiers and DEMS can attach only to elements of type *n-noun*.



Phrasal modifiers and DEMS select only elements of type *n-noun*.



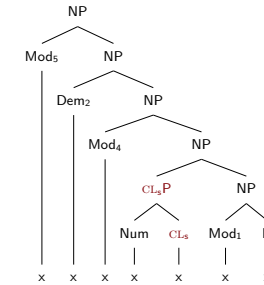
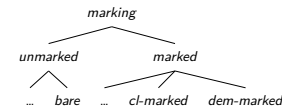
The modification of the noun (or CL) follows directly from the NP structure.



In contrast to Ger or Eng, where **only one specifier** is allowed (and required) we assume that MC makes use of the **head-functor structure** for **modifiers** and **specifiers**.
(Van Eynde 2006, 2020, 2021)

- ▶ **SP**: the functor (e.g. Mod₁ to N) selects a head (*n-noun*),
- ▶ **HFP**: the properties of the head are projected,
- ▶ **GMP**: the MARKING value of the resulting phrase is determined by the functor.

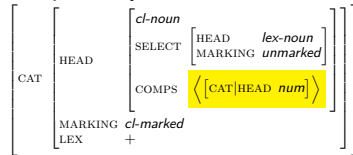
(15) Hierarchy of MARKING values



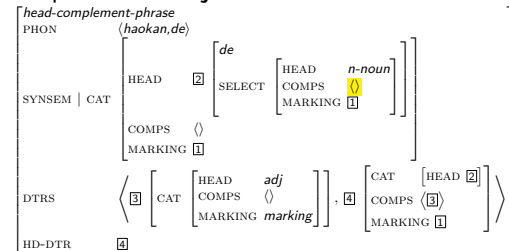
Why is there a strong connection between NUM and CL?

(it is not possible to have *NUM+DeP+CL)

(16) Sample entry for classifiers

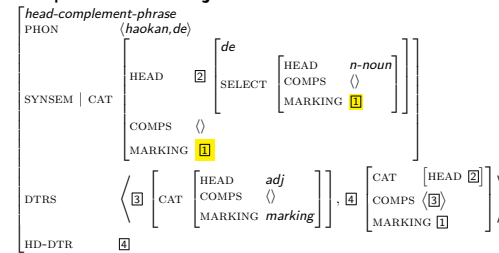


(17) Sample DeP for adjectives

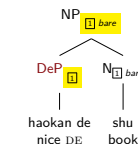
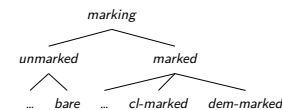


Why are several modifiers possible, but not several CLs or DEMS?

(18) Sample DeP for adjectives



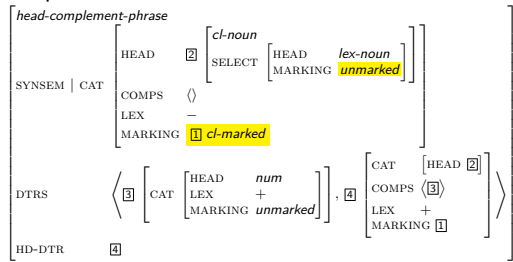
(19) Hierarchy of MARKING Values



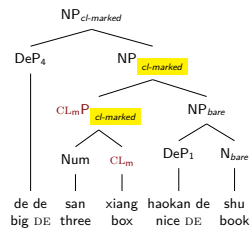
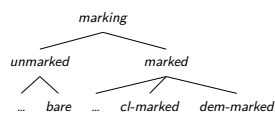


Why are several modifiers possible, but not several CLS or DEMs?

(20) Sample structure for Classifier Phrase

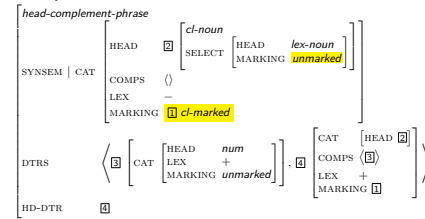


(21) Hierarchy of MARKING Values

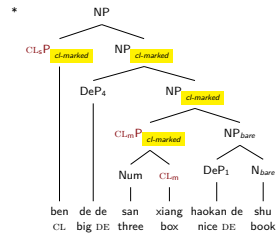
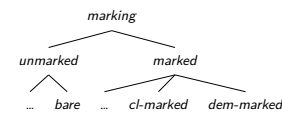


Why are several modifiers possible, but not several CLS or DEMs?

(22) Sample structure for Classifier Phrase

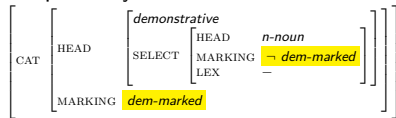


(23) Hierarchy of MARKING Values

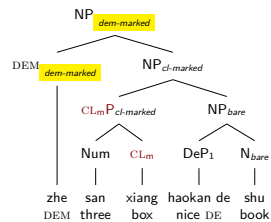
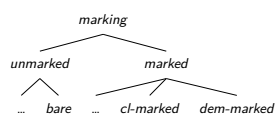


But DEM can combine with CL-marked phrases

(24) Sample entry for demonstratives

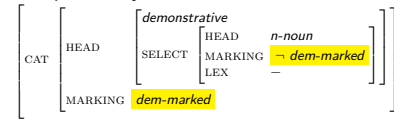


(25) Hierarchy of MARKING Values

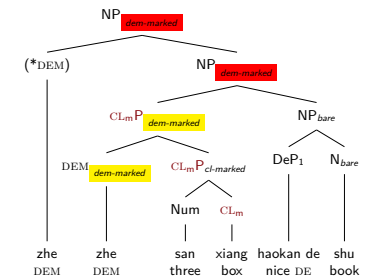
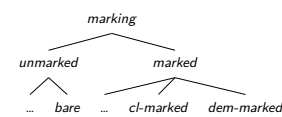


Multiple DEMs are impossible, like multiple CLS (even when DEM attaches to CLP)

(26) Sample entry for demonstratives



(27) Hierarchy of MARKING Values





Why is the combination of DEM and N **only sg** (28c), but the DEM with a modified N **sg or pl** (28b)?

- (28) a. wo mai-le shu.
 I bought-PFV book
 'I bought {a/the book / ∅/the books}.' bare: sg/pl
- b. wo mai-le zhe da de shu.
 1.SG buy-PFV DEM big DE book
 'I bought {this big book/these big books}.' DEM+Mod+N: sg/pl
- c. wo mai-le zhe shu.
 1.SG buy-PFV DEM book
 'I bought this book.' DEM+N: sg



DEM can combine only with an element of type *n-noun* with value LEX –
 (for LEX, see Pollard & Sag 1987; Arnold & Sadler 1992)

(29) Sample entry for **demonstratives**

$$\left[\begin{array}{l} \text{CAT} \left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} \text{demonstrative} \\ \text{SELECT} \left[\begin{array}{l} \text{HEAD} \quad n\text{-noun} \\ \text{MARKING} \quad - \text{dem-marked} \\ \text{LEX} \quad - \end{array} \right] \end{array} \right] \\ \text{MARKING} \quad \text{dem-marked} \end{array} \right] \end{array} \right]$$

A **bare noun** has the value LEX +, but after the **combination with a modifier** it has the value LEX –

(30) Sample entry for *n-nouns*

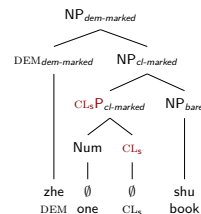
$$\left[\begin{array}{l} \text{CAT} \left[\begin{array}{l} \text{HEAD} \quad n\text{-noun} \\ \text{MARKING} \quad \text{bare} \\ \text{LEX} \quad + \end{array} \right] \end{array} \right]$$

Number neutrality (sg or pl) follows from the number underspecification of N.



When a DEM combines with a “bare” N there is a number specification → ‘one’

- (31) wo mai-le zhe shu.
 1.SG buy-PFV DEM book
 'I bought this book.'



Needed: a **phonologically empty** NUM expressing a singular cardinality relation (combined with a null CL_S via *head-complement-phrase*).

(32) Sample entry for numerals

$$\left[\begin{array}{l} \text{CAT} \left[\begin{array}{l} \text{HEAD} \quad \text{num} \\ \text{MARKING} \quad \text{unmarked} \\ \text{LEX} \quad + \end{array} \right] \end{array} \right]$$


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Conclusion

- Q1: **bare N** and **complex N** are allowed as NP structures.
- Q2: MC treats DEM, CL, and Mod as **functors** (no specifier needed).
- ▶ iteration of Mods,
 - ▶ no iteration of DEM and NUM+CL,
 - ▶ combination of DEM and NUM+CL
- Q3: NUM+CL is accounted for as a *head-complement-phrase*, modifiers select elements with empty COMPS
- Q4&5: CL_m and CL_s have **different structures**.
DEM and Mod can attach only to elements of type *n-nouns*, i.e. CL_m or N
- Q6: **singular-plural asymmetry** in the combination with DEM, is solved by means of a lexicon containing only one phonologically empty NUM+CL_s combination, where NUM = 1



Comparison to other languages

- ▶ The behaviour of prenominal elements in **MC** is **very different** from **Ger**
→ Both favor an NP account, but require different treatments for prenominal elements
- ▶ Complex and recursive specifiers/functors:
 - ▶ **Ger** prenominal elements → **specifiers** (and modifiers)
 - ▶ **MC** prenominal elements → **functors**
- ▶ Two-way typology of languages – parallel to the **NP/DP parameter** proposed in the minimalist tradition
(Chierchia 1998; Cheng & Sybesma 1999; Bošković 2008
Bošković & Gajewski 2011; Bošković et al. 2013)
- ▶ Many **independent properties** have been argued to follow from the absence of dedicated determiners in languages.
→ Reinterpretation of these findings in terms of the absence of a *specifier-head-phrase* (e.g. in MC, Serbo-Croatian, Turkish, Polish, Czech)



References I

- Allegrezza, Valerio. 1998. Determiners as functors: NP structure in Italian. In Sergio Balari & Luca Dini (eds.), *Romance in HPSG*, 55–107. Stanford, CA: CSLI Publications.
- Allegrezza, Valerio. 2007. *The signs of determination: Constraint-based modelling across languages*. Frankfurt am Main: Peter Lang.
- Arnold, Doug J. & Louisa Sadler. 1992. Noun-modifying adjectives in hpsg. *Working Papers in Language Processing* (35). http://privatewww.essex.ac.uk/~doug/index_5.html.
- Bošković, Željko. 2008. What will you have, DP or NP? In Emily Elfner & Martin Walkow (eds.), *Proceedings of the North East Linguistic Society*, vol. 37 1, 101–114. Amherst, MA: University of Massachusetts Press.
- Bošković, Željko & Jon Gajewski. 2011. Semantic correlates of the NP/DP parameter. In *Proceedings of North East Linguistic Society*, vol. 39, 121–134.
- Bošković, Željko, I Hsieh & Ta Chris. 2013. On word order, binding relations, and plurality in chinese noun phrases. *Studies in Polish Linguistics* 8(4).
- Bruening, Benjamin. 2009. Selectional asymmetries between CP and DP suggest that the DP hypothesis is wrong. In Laurel MacKenzie (ed.), *Proceedings of the 32nd annual Penn Linguistics Colloquium* (Penn Working Papers in Linguistics 15.1), 26–35. Pennsylvania: University of Pennsylvania. <http://repository.upenn.edu/pwpl/vol15/iss1/5>.
- Bruening, Benjamin. 2020. The head of the nominal is N, not D: N-to-D movement, hybrid agreement, and conventionalized expressions. *Glossa: A Journal of General Linguistics* 5(1), 1–19. doi:10.5334/gjgl.1031.
- Bücking, Sebastian. 2009. How do phrasal and lexical modification differ? Contrasting adjective-noun combinations in German. *Word Structure* 2(2), 184–204.
- Chao, Yuen Ren. 1968. *A grammar of spoken Chinese*. Berkeley: University of California Press.
- Cheng, Lisa Lai-Shen & Rint Sybesma. 1999. Bare and not-so-bare nouns and the structure of NP. *Linguistic Inquiry* 30(4), 509–542.
- Chierchia, Gennaro. 1998. Reference to kinds across languages. *Natural Language Semantics* 6(4), 339–405. doi:10.1023/A:1008324218506.
- Chomsky, Noam. 2007. Approaching UG from below. In Uli Sauerland & Hans-Martin Gärtner (eds.), *Interfaces + recursion = language?: Chomsky's Minimalism and the view from syntax-semantics* (Studies in Generative Grammar 89), 1–30. Berlin: De Gruyter. doi:10.1515/9783110207552.
- Chomsky, Noam, Angel J. Gallego & Dennis Ott. 2019. Generative grammar and the faculty of language: Insights, questions, and challenges. *Catalan Journal of Linguistics* Special Issue: Generative Syntax. Questions, Crossroads, and Challenges. 229–261. doi:10.5565/rev/catjl.288.
- Her, One-Soon. 2012. Distinguishing classifiers and measure words: A mathematical perspective and implications. *Lingua* 122(14), 1668–1691. doi:https://doi.org/10.1016/j.lingua.2012.08.012. <https://www.sciencedirect.com/science/article/pii/S0024384112001702>.



References II

- Huang, Cheng-Teh James, Yen-hui Audrey Li & Yafei Li. 2009. *The syntax of Chinese*, vol. 10 Cambridge Syntax Guides. Cambridge: Cambridge University Press. doi:10.1017/CBO9781139166935.
- Liao, Wei-wen Roger & Yuyun Iris Wang. 2011. Multiple-classifier constructions and nominal expressions in chinese. *Journal of East Asian Linguistics* 20(2), 145–168.
- Machicao y Priemer, Antonio. 2022. Kopf. In Stefan Schierholz & Pál Uzonyi (eds.), *Grammatik: Syntax*, 508–514. Berlin: De Gruyter. doi:10.1515/9783110698527. https://www.researchgate.net/publication/326046856_Kopf_Pre-Print.
- Machicao y Priemer, Antonio & Stefan Müller. 2021. NPs in German: Locality, theta roles, possessives, and genitive arguments. *Glossa: A Journal of General Linguistics* 6(1), 46.1–38. doi:10.5334/gjgl.1128. <https://doi.org/10.5334/gjgl.1128>.
- Müller, Stefan & Antonio Machicao y Priemer. 2019. *Head-Driven Phrase Structure Grammar*. In András Kertész, Edith Moravcsik & Csilla Rákosi (eds.), *Current approaches to syntax – A comparative handbook* (Comparative Handbooks of Linguistics 3), Berlin: De Gruyter Mouton. doi:10.1515/9783110540253-012. <https://www.degruyter.com/view/product/486143>.
- Paul, Waltraud. 2005. Adjectival modification in Mandarin Chinese and related issues. *Linguistics* 43(4), 757–793.
- Pollard, Carl J. & Ivan A. Sag. 1987. *Information-based syntax and semantics. Volume 1: Fundamentals*. Stanford, CA: CSLI Publications.
- Pollard, Carl J. & Ivan A. Sag. 1994. *Head-Driven Phrase Structure Grammar* Studies in Contemporary Linguistics. Chicago: University of Chicago Press.
- Sun, Chaofen. 2015. The uses of DE as a noun phrase marker. In William S.-Y. Wang & Chaofen Sun (eds.), *The Oxford handbook of Chinese linguistics*, 362–376. New York: Oxford University Press. doi:10.1093/oxfordhb/9780199856336.013.0027.
- Van Eynde, Frank. 2006. NP-internal agreement and the structure of the noun phrase. *Journal of Linguistics* 42(1), 139–186. doi:10.1017/S0022226705003713.
- Van Eynde, Frank. 2020. Agreement, disagreement and the NP vs. DP debate. *Glossa: A Journal of General Linguistics* 5(1), 65. 1–23. doi:10.5334/gjgl.1119.
- Van Eynde, Frank. 2021. Nominal structures. In Stefan Müller, Anne Abeillé, Robert D. Borsley & Jean-Pierre Koenig (eds.), *Head-Driven Phrase Structure Grammar: The handbook*, 275–313. Berlin: Language Science Press.
- Zhang, Niina Ning. 2011. The constituency of classifier constructions in Mandarin Chinese. *Taiwan Journal of Linguistics* 9(1), 1–50. doi:10.6519/TJL.2014.12(2).1.