Mandarin Chinese nominal complexes: unifying classifiers, modifiers and demonstratives

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1 Introduction

The structure of Mandarin Chinese nominal complexes (CNCs) is subject to extensive research, with the main issues centering on the implications for right and left-branching analyses and for the NP/DP\(^1\) debate (Cheng & Sybesma, 1999; Bošković & Hsieh, 2013; Her & Tsai, 2020; Jiang et al., 2022). However, there has been little work on CNCs in the tradition of HPSG (Pollard & Sag, 1994). In this paper, we attempt to bridge this gap and argue that the distributional properties of Mods and Dems with respect to Ns and CLs motivate a head-functor approach (HFA) (Van Eynde, 2006), where [Num CL N] sequences are analyzed as left-branching NPs. The HFA allows us to unify the combinatorial properties of CLs, Mods and Dems (thus explaining their similarities in Mandarin Chinese), while also accounting for their differences by means of selectional constraints and a hierarchy of M(A)RK(ING) values. All in all, our analysis entails that CNCs are fundamentally different from nominal structures in languages with dedicated determiners, suggesting a two-way typology of languages which is parallel to the NP/DP parameter proposed in the minimalist tradition (Chierchia 1998; Bošković 2008, i.a.).

2 Basics

CNCs denoting quantities usually consist (minimally) of [Num CL N] sequences, as in (1). The occurrence of a Num depends on the realization of CL, i.e. [Num N] sequences (cf.(2)) are ungrammatical. In contrast, in specific constructions such as Dem-CL-NP, Num can be omitted, iff Num = 1 and there is no XP between Dem and CL (cf.(3)).\(^2\) Thus, only a singular reading is available in these constructions.

(1) san ben shu
three CL book
‘three books’

(2) *san shu
three book
‘three books’

(3) zhe (*youqu-de) ben shu
DEM interesting-de CL book
‘this book’

CLs have been categorized into different types based on their semantics (Chao 1968; Cheng & Sybesma 1999, a.o.). We follow the mainstream classification distinguishing between measure CLs (CL\(_m\)) and sortal CLs (CL\(_s\)), assuming that only the former have lexical meaning and make extra semantic contributions. Contrary to Cheng & Sybesma (1999), we argue that CL\(_s\) and CL\(_m\) have the same syntactic behaviour w.r.t., e.g. Adj-CL and de-insertion (cf. Tang 2005, Li 2013, a.o. for examples contra Cheng & Sybesma 1999). That is, it can be argued that CL\(_s\) and CL\(_m\) are semantically distinct, but share syntactic similarities (Her, 2012).

\(^1\)Abbreviations used in the paper: N(P)= noun (phrase), DP = determiner phrase, Num = numeral, CL = classifier, Dem = demonstrative, V = verb, P(P)= preposition (phrase), Adj = adjective, Mod = modifier, PERF = perfective, SG = singular, CL\(_m\) = measure classifier, CL\(_s\) = sortal classifier, DeP = arguments/adjuncts of NP marked with de.

\(^2\)We follow Paul (2005) and Sun (2015) in distinguishing syntactic and morphological modifiers within CNCs: all the syntactic arguments and modifiers of NPs such as AdjPs, PP, NPs and relative clauses are always marked by -de. We call all such elements phrases DePs but, in this paper, we focus mostly on modifying DePs. Morphological modifiers (Mod-N sequences, which have word or compound-like status) will not be considered in this paper.
3 Structural ambiguity of pre-Num elements

A phrase modifying N can immediately precede N or Num-CL, as (4) illustrates. However, it has been observed that a modifier preceding Num can modify the classifier (cf. (5)).

(4)  
\( \text{hen haochi-de) yi xiang } \text{ (hen haochi-de) yingtao} \)  
very delicious-DE one CL\(_m\) \(\approx\) ‘box’ very delicious-DE cherry  
‘a box of delicious cherries’

(5)  
\( \text{dada-de yi wan } \text{ xiao yingtao} \)  
big-DE one CL\(_m\) \(\approx\) ‘bowl’ small cherry  
‘a big bowl of small cherries’

(Zhang, 2011, ex. (8a))

That is, pre-Num elements can scope over both CL\(_s\) and N\(_s\), which is a challenge for both left-branching ([[Num CL] N]) and right-branching ([Num [CL N]]) analyses, assuming modification is local (cf. Machica y Priemer & Müller 2021). For instance, in a right-branching approach (cf. Fig. 2), CL is first combined with its complement N to form a CLP. The CLP is further combined as a complement of Num, projecting a NumP (cf. Cheng & Sybesma 1999). In this case, pre-Num elements could not directly modify N without violating locality restrictions. Conversely, in left-branching approaches, if [[Num-CL] NP] is assumed to be an NP, then scope over the CL\(_m\) would be unexplained. To account for the possible modification of CL and N, we propose a left-branching structure which allows CL\(_s\) and N\(_s\) to be modified independently in accordance with locality restrictions, as shown in Fig. 1. Hence, the ambiguity in (6) can be explained straightforwardly by means of the modifier’s attachment as Mod\(_1\) or Mod\(_2\), locally modifying N or CL, respectively, (cf. (7)). That is, our proposal accounting for the Mod ambiguity in CNCs suggests that Mandarin Chinese has left-branching NPs with two attachment sites for Mods (cf. Her & Tsai 2020; Jiang et al. 2022 for an overview of the branching debate).

(6)  
\( \text{haokan-de yi xiang } \text{ shu} \)  
nice-DE one CL\(_m\) \(\approx\) ‘box’ book  
‘a nice box of books’ or ‘a box of nice books’

(7)  
\( \text{[chao haochi-de]}_1 \text{ [dada-de]}_2 \text{ yi wan}_2 \text{ xiao yingtao}_1 \)  
very delicious-DE big-DE one CL\(_m\) \(\approx\) ‘bowl’ small cherry  
‘a big bowl of very delicious small cherries’

4 Complexity of NP: demonstratives

Unlike German or English, bare N\(_s\) in Mandarin Chinese are number neutral and do not need a determiner to function as arguments (Huang et al., 2009). However, demonstratives like zhe (‘this’/‘these’) and na (‘that’/‘those’) can appear in different positions inside CNCs, e.g., before a bare N (8) or before Num-CL (9). It should be taken into account that a number neutral N preceded by Dem can only be interpreted as singular (cf. (8)). Nevertheless, as (9) shows, Dem cannot restrict the interpretation of N to a singularity, since it is compatible with a plural CLP. This suggests that in cases like (8), a phonetically empty singular Num-CL needs to be assumed.

(8)  
\( \text{na shu} \)  
DEM book  
‘that book’

(9)  
\( \text{na san ben shu} \)  
DEM three CL book  
‘those three books’

Dem in Mandarin Chinese has properties that are different from typical specifiers in languages such as English and German, and in some cases more similar to Mods. For instance,
Dem behaves like Mod w.r.t. the projection it can be attached to. Depending on the type of CL, Dem and Mod can either attach only to the N projection (when CL is a CLₘ) – cf. (10b), or they can attach to both the N or the CL projection (when CL is a CLₘ), leading to a structural ambiguity – cf. (10a), and Dem₁ and Dem₂ respectively in Fig. 3. The possibility of CLs to be combined with Dem or Mod correlates with the type of meaning introduced by the CLs. For instance, since CLₘs are semantically purely functional, these elements cannot be modified nor combined with Dem (cf. (10b)). In this case, if a Dem or a Mod is realized preceding Num-CL, it scopes over N. In contrast, CLₘ introduces a more lexical meaning (cf. ‘box’ in (10a)) that allows modification and hence the attachment of Mod or Dem within CLP is possible.

\[(10)\]

a. na san xiang shu
   Dem three CLₘ ≈ ‘box’ book
   ‘those three boxes of books’ or ‘three boxes of those books’

b. na dada-de san ben shu
   Dem big-DE three CLₘ book
   ‘those three big books’

c. dada-de na san wan xiao yingtao
   big-DE Dem three CLₘ ≈ ‘bowl’ small cherry
   ‘those three big bowls of small cherries’

As we see in more detail below, the mixed behavior of CLs, Mods, and Dems in Mandarin Chinese motivates an analysis of CNCs in terms of head-functor-phrases instead of head-specifier-phrases, following Van Eynde (2006). This approach unifies Mods, Dems and CLPs under the category of functors bearing a SELECT feature. A further aspect supporting an NP head-functor analysis for CNCs is the distribution of Dems relative to Mods. Unlike specifiers, Dems can be preceded (10c) or followed (10b) by Mods, regardless of which type of CL is used or whether a CL is used at all. That is, like Mods, the position of Dems within the phrase is quite flexible (cf. Fig. 3: with Mod₂ and Mod₃ relative to Dem₁; and Mod₄ and Mod₅ relative to Dem₂).

In general, whenever CL can be modified by a phrase marked with de (i.e. a DeP), then specification by Dem is also possible. This CLP-internal Dem position is further supported by the observation that Dems can act as semantic functors over classifier meanings. Suppose three identical books are placed respectively in a box and in a basket. In the case of contrast, the classifier is emphasized: na XIANG shu, bushi na LAN shu ‘that box book not that basket book’. Similarly, stress can be placed on N to distinguish between the contents of the identical boxes. Hence, like NPs, a CLP, a classifier can have its own Dem and Mods. Considering all the possibilities mentioned above, we obtain the analysis for CNCs displayed in Fig. 3.

This proposal predicts non-spurious (i.e. semantically meaningful) structural ambiguities:

\[(11)\]

wo mai-le da-de na san xiang shu.
   1.SG buy-PERF big-DE Dem three CLₘ ≈ ‘box’ book
   ‘I bought those three big boxes of books.’ or
   ‘I bought three boxes of big books.’ or
   ‘I bought three boxes of those big books.’

Notice that the meaning ‘three big boxes of those books’ is ruled out by the structure in Fig. 3. In the next section, we focus on how this structure can be derived on principled grounds. As we mentioned above, the flexibility of attachment of Mods and Dems suggests that CNCs are not head-specifier structures (Machicaoy Priemer & Müller, 2021). We discuss how the head functor approach (Van Eynde, 2006) allows us to derive the patterns we have seen so far.

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³For the sake of space, we are not considering kind classifiers (cf. Zhang 2011).
5 A head-functor analysis

There are two main candidates for specifiers in Mandarin Chinese: determiners and CLPs. However, the data we have seen show that these categories lack the characteristics typically ascribed to specifiers in languages like English and German. As we suggested, their syntactic behavior is not substantially different from that of typical modifiers like APs, relative clauses and PPs.

- Dems and CLPs are not required for the purposes of lexical selection (given the abundance of bare Ns), as is also the case with Mods.
- Dems and CLPs can co-occur within a single NP (cf. (11)), similarly to what we see among Mods of different semantic types (e.g. the big red book).
- Dems and CLPs do not have to occupy a designated position within the NP which is distinct from that of Mods.

All of these features are cited as motivations for the HEAD-FUNCTOR ANALYSIS (HFA) of NP structure (cf. Van Eynede 2006).\(^4\) The HFA eliminates the distinction between specifiers and Mods, and, thus, also the SPR feature on the head N. Selection occurs via the SELECT feature on functor categories. To register the effects of prenominal elements on N the M(A)RK(ING) feature (Pollard & Sag, 1994, 46) is used. General constraints on head-functor phrases guarantee that the MRK values of the functor get projected. Building on Van Eynede (2006, 167), we assume the sort-hierarchy for MRK values in Fig. 4. We also assume CLs and Ns are part of the same hierarchy for heads in Fig. 5. DeP and Dem functors only select elements of type n-noun.

The schematic entries in Figs. 6–9 are sufficient to account for all of the structures mentioned above. We assume further that any phrasal combination is [LEX −] (Pollard & Sag, 1987) and that the lexicon contains, in addition to overt numeral expressions corresponding to various cardinal relations, also a phonologically null CL phrase conveying Num=1 (cf. (8)).

These constraints correctly predict that: (i) bare Ns can be full NPs; (ii) Mods can be freely iterated and are structurally ambiguous in pre-Num positions in structures with CLmS and Ns are both of type n-noun; (iii) Dem can specify both N and CLm (because it also selects n-nouns); (iv) CLP and Dem cannot be iterated (due to constraints on the MRK values of the elements they select); (v) [Dem N] can only be interpreted as sg (since Dem selects a phrase specified as [LEX −], a CLP must be assumed, but the covert CLP only conveys Num = 1).

6 Conclusion and typological hypothesis

In this study we proposed an HPSG analyses for CNCs. In Mandarin Chinese, as opposed to languages with dedicated determiners, the ubiquitous presence of bare nouns and the fact that typical modifiers (e.g. APs) and typical specifiers (Dems) can be freely interweaved and co-occur motivate head-functor-phrase analysis. The structural ambiguity of pre-Num elements also supports this approach and provides evidence for a left-branching structure headed by N.

This general outlook suggests a typology of languages which is parallel to the NP/DP parameter proposed in the minimalist tradition (Chierchia, 1998; Cheng & Sybesma, 1999; Bošković & Hsieh, 2013). Many independent properties have been argued to follow from the absence of dedicated determiners (Bošković, 2008). We can reinterpret these findings in terms of the absence of a specifier-head-phrase in languages like Mandarin Chinese, Polish and Turkish. It remains to be seen the extent to which Mandarin Chinese conforms to these generalizations and how they can be derived from the differences between head-functor and specifier-head phrases.

\(^4\)Possessives in MC are even clearer in their syntactic similarity to Mods. In addition to the properties mentioned above, they are also realized as DePs. However, possessives are also treated as Mods in some spec-head languages.
Figures

Figure 1: Modification of CL & N

Figure 2: Right-branching (Cheng & Sybesma, 1999)

Figure 3: CNC structure

Figure 4: Hierarchy of MRK Values

Figure 5: Hierarchy of HEAD Values

Figure 6: Sample DeP for adjectives

Figure 7: Sample structure for CLP

Figure 8: Schematic entry for demonstratives

Figure 9: Schematic entry for n-nouns
References


Her, One-Soon & Hui-Chin Tsai. 2020. Left is right, right is not: On the constituency of the classifier phrase in Chinese. Language and Linguistics 21(1). 1–32.


