A NOTE ON MANDARIN CHINESE WORDHOOD*

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Abstract: This study investigates the structural differences between the so-called *de*-modification, [Adj *de* N], and the so-called *de*-less modification, [Adj N], in Mandarin Chinese. I argue that the Adj's followed by *de* are phrasal and have freer syntactic distribution. I further argue that the *de*-less modification should be analyzed as a morphosyntactic word (MWd) under the N head in the sense of Embick – Noyer (2001). This proposal accounts for the ordering fact that Adj's with *de* cannot intervene between a *de*-less Adj and N or between two *de*-less Adj's.

Keywords: morphology, wordhood, morphosyntactic word, subword, Mandarin Chinese

There are two kinds of adjectival modification in Mandarin Chinese (Mandarin), as in (1). The example in (1a) demonstrates the so-called *de*-modification, and the one in (1b) *de*-less modification. The syntactic status of *de*-less modification in Mandarin is controversial and is the focus of

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(1)   (a)   [[Adj *de*] N]^1
            yi   zhi [bai   **de**]   haibao
            one cl   white de$_{Mod}$ seal
            'a white seal'

      (b)   [[Adj] N]
            yi   zhi [bai]   haibao
            one cl   white seal
            'a white seal'

this paper. Sproat and Shih (S&S) (1987; 1991) argue that *de*-less mod-
ification is essentially compounding and involves the formation of nouns
from other nouns. Moreover, they suggest that *de*-less modification is
subject to ordering restrictions. Contrary to S&S (1987; 1991), Duanmu
(1998), and Simpson (2001), Paul (2003) argues that *de*-less modification
should be treated as a phrasal element, not words. The morpho-syntactic
status of *de*-less modification remains an unsettled question. This paper
takes the syntactic structure of Mandarin modified nouns as in (1) as a
window to probe into the investigation of Chinese wordhood. The main
proposal I advance in this paper is that *de*-less modification, the [[Adj] N]
sequence, forms a **morphosyntactic word** (MWd) under the N head in the
sense of Embick–Noyer (2001). I argue that the morphosyntactic word
formation in (1b) does not involve the formation of nouns from other
nouns because all the elements in the domain of N are **subwords**, which
do not carry a syntactic category.

1. Introduction

In general, nominal modifiers like adjectives (Adj) and relative clauses
(RC) can occur in the pre-N position, as in (2), or the pre-D position,
as in (3).^{2}

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^{1} Throughout this paper, I use 'N' or 'noun' as a general term for ease of exposition.
When a specific syntactic category is needed for discussion, I will spell it out. In
the glosses, 'cl' stands for 'classifier'.

^{2} I take pre-N and pre-D as two general terms. Pre-N is merely used to describe
a construction in which an Adj/RC occurs between a classifier and a noun in
the surface word order. In contrast, pre-D refers to a construction in which an
Adj/RC appears to the left of a numeral or a demonstrative. In order to highlight
this point, I have put AdjP/RC and the marker *de* in brackets. I use this notation
through section **4.6.** In section **4.7**, I propose a phrase structure in which *de* is a
phrasal head.

The examples in (2)–(3) are taken from Tang (1990, 410 (20)–(21)) with a slight modification of the gloss.[3]

(2) **Pre-N modification**

    (a) [$_{DP}$ na yi ben [$_{AdjP}$ xin **de**]   shu]
          that one cl   new de$_{Mod}$ book
    'that new book'

    (b) [$_{DP}$ na san ben [$_{RC}$ wo xie **de**] shu]
          that three cl   I   write de$_{Mod}$ book
    'those three books that I wrote'

(3) **Pre-D modification**

    (a) [$_{AdjP}$ xin **de**]   [$_{DP}$ na yi ben shu]
          new de$_{Mod}$ that one cl book
    '(lit.) new that book'/'that new book'

    (b) [$_{RC}$ wo xie **de**]   [$_{DP}$ na san ben shu]
          I   write de$_{Mod}$ that three cl book
    '(lit.) I wrote, that three book'/'those three books that I wrote'

Notice that both adjectives and relative clauses are marked by *de* at the rightmost edge. Among these four examples in (2)–(3), only the *de* in the example in (2a) can be absent, as shown in (4)–(5):

(4) **Pre-N modification**

    (a) [$_{DP}$ na yi ben [$_{AdjP}$ xin **de**]   shu]
          that one cl   new de$_{Mod}$ book
    'that new book'

    (a′) [$_{DP}$ na yi ben [xin] shu][4]   (without *de* → ✓)
          that one cl   new book
    'that new book'

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[3] I agree with Huang's (1982, 68) observation that semantically the distinction between (2a) and (3a) (or (2b) and (3b)), i.e., the distinction between pre-N and pre-D, is sometimes hard to detect and may appear to some to be somewhat artificial. He further suggests that it may even be argued that speakers often feel free to use either order without intending a difference in meaning. Nevertheless, Huang suggests that it is important to note that the distinction does exist, however subtle it may be.

[4] In this example, I did not label *xin* 'new' as AdjP because I believe that *xin* by itself does not have the same syntactic category as *xin de* in (4a). I elaborate

(b) [$_{DP}$ na   san   ben [$_{RC}$ wo xie   **de**]   shu]
          that three cl   I   write de$_{Mod}$ book
      'those three books that I wrote'

(b′) *[$_{DP}$ na   san   ben [$_{RC}$ wo xie]   shu]   (without $de \rightarrow$ *)
          that three cl   I   write book

(5) **Pre-D modification**

(a) [$_{AdjP}$ xin **de**]   [$_{DP}$ na   yi   ben shu]
            new de$_{Mod}$ that one cl   book
      '(lit.) new that book'

(a′) *[xin] [$_{DP}$ na   yi   ben shu]   (without $de \rightarrow$ *)
        new   that one cl   book

(b) [$_{RC}$ wo xie   **de**]   [$_{DP}$ na   san   ben shu]
          I   write de$_{Mod}$ that three cl   book
      'those three books that I wrote'

(b′) *[$_{RC}$ wo xie]   [$_{DP}$ na   san   ben shu]^5 (without $de \rightarrow$ *)
          I   write   that three cl   book

The examples in (4)–(5) demonstrate that the morpheme *de* can be omit-
ted only when an adjective appears in the pre-N position, as in (4a'). In
the literature, adjectives without *de* have been called *de*-less modifica-
tion, and adjectives with *de* have been called *de*-modification. For the
sake of convenience, I adopt this terminology in the first three sections
in this paper.

Two critical questions emerge from the data in (4)–(5). First, why
does (4a′) allow *de* to be absent, but not (5a′)? Second, what kind
of morphological or syntactic category is *xin* 'new' in (4a′)? Is it still
an AdjP? If not, what is it? This paper is devoted to answering these
questions and some other issues that arise in later sections, such as why
adjectival ordering restrictions only affect *de*-less modification but not
de-modification in Mandarin. The structure of this paper is as follows:
I first present some background information about adjectives with and

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on this point in the analysis section. Hence, I leave the syntactic category of *xin*
'new' in (4a′) and (5a′) blank at this moment and come back to it later in the
text.

^{5} (5b′) is grammatical under the reading that 'I write those three books.' That
is, all the elements in (5b′) form a sentence, not a nominal phrase containing
a relative clause. (5b′) is ungrammatical under the reading that 'I write' is a
relative clause and 'those three books' is a DP.

without *de* in section **2.** I then review in section **3** some previous studies in the literature which are related to the questions that I address in this paper. In section **4**, I discuss my proposal and see to what extent it can better account for the data than the previous studies. Section **5** concludes this paper.

2. Background information

In this section, I provide an initial description of *de*- and *de*-less modification in Mandarin.

2.1. *de* in adjectives

As discussed in section **1**, the morpheme *de* can be absent (see (4a′)). However, this possibility is not random. When there is more than one Adj with *de* in the pre-N position, the *de* between Adj's cannot be absent.[6] The example in (6a) has two AdjP's with *de* marking.[7] (6b) shows that the absence of de_1 leads to ungrammaticality, while it is possible to omit de_2 in this example, as illustrated in (6c).

(6) (a) [[Adj ***de***$_1$] [Adj ***de***$_2$] N]

   yi   zhi [ke'ai **de**$_1$]   [bai   **de**$_2$]   haibao

   one cl   cute   de$_{Mod}$ white de$_{Mod}$ seal

   'a cute white seal'

   (b) *[[Adj] [Adj ***de***$_2$] N]

   *yi   zhi [ke'ai] [bai   **de**$_2$]   haibao

   one cl   cute   white de$_{Mod}$ seal

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[6] Unless there is a coordinator between adjectives. Examples of this sort will be given later in the text.

[7] This example is possible in other dialects of Mandarin, but it is not natural in the dialect I study. There are a number of different strategies to make (6a) sound natural. One is by removing the *de* closer to the noun as demonstrated in (6c). (6c) is the natural expression in the dialect I study, but (6a) is not. Another way of making (6a) sound better is to have a pause between these two Adj's. In Chinese writing, a comma will be inserted between these two Adj's to indicate the pause. The other way is to express the meaning of an Adj through a relative clause. All these different strategies are used to avoid having two juxtaposed Adj's with *de*. More discussion is provided in sections **2–4.**

(c)   [[Adj **de_1**] [Adj] N]
    yi   zhi [ke'ai **de_1**]   [bai]   haibao
    one cl   cute de_{Mod} white seal
  'a cute white seal'

One might wonder whether it is possible to omit de_1 in (6c) after omitting de_2. The answer, I believe, varies from dialect to dialect. In my dialect, it is not possible. Another question is whether it is possible in other dialects. If yes, how many *de*-less adjectives are allowed in the pre-N position? Or, in general, how many adjectives are allowed in the pre-N position? I explore these possibilities in section **2.2.**

2.2. How many Adj's are allowed in the pre-N position?

In this section, I survey the possible number of *de*- and *de*-less- adjectives in the pre-N position.

2.2.1. *de*-less Adj's

The number of possible *de*-less Adj's in the pre-N position varies. It depends on the nature of the head nouns, the Adj's, and the dialect in question.[8] In general, having one *de*-less Adj before a noun is common across different dialects of Mandarin. The following examples are from Li–Thompson (1989, 118 (90)–(92)):

(7)   (a)   hong hua
      red   flower
     'red flower(s)'

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[8] It is well-known in the literature that the dialects of Mandarin vary from each other greatly in several aspects, and wide variation in usage is often noted (e.g., Li–Thompson 1989, "Preface"). However, the degree of variation still strikes me when I consulted the grammatical examples cited in Sproat–Shih (1987; 1991) with my informants whose dialect is mainly spoken in Taiwan. The analysis I propose in this study is able to account for their examples, but I find it necessary to clarify that some of the grammatical examples from Sproat and Shih are not acceptable to me and my informants. Since section **2** is a section for stating basic facts, most of the examples are drawn from the literature. Whenever there is dialectal variation, I will point it out specifically. In section **4**, I focus on the data that my informants and I accept, which is what my analysis is based on.

(b) ying xiangpi
    hard rubber
    'hard rubber'

(c) yuan zhuozi
    round table
    'round table(s)'

When the number of *de*-less Adj's in the pre-N position increases, the tolerance varies among native speakers of different dialects of Mandarin. The dialects reported by S&S (1987; 1991) and Paul (2003) accept more than one *de*-less Adj's in the pre-N position. S&S (1987; 1991) point out that the number of *de*-less Adj's in the dialect they study is limited to at most two. The following examples are from S&S (1987, 471 (19a–c)). I note the judgments from my informants on the side (Taiwan dialect). For convenience of discussion, I call the dialect reported by S&S **Dialect A**, and the one I report in this study **Dialect B**.

(8) **Dialect A:**   **Dialect B:**

  (a) hao hong pan-zi   (a′) *hao hong pan-zi
     good red   plate
     'good red plate(s)'

  (b) hao   yuan pan-zi   (b′) *hao yuan pan-zi
     good round plate
     'good round plate(s)'

  (c) xiao yuan pan-zi   (c′) *xiao yuan pan-zi
     small round plate
     'small round plate(s)'

An informant I consulted, whose dialect is spoken in Mainland China, found the examples reported by S&S acceptable. However, those informants who speak the dialect spoken in Taiwan find the examples in (8) extremely awkward. Their first reaction to these examples were all "What? No!" When they were asked to repeat the examples, they all inserted ***de*** between two *de*-less Adj's, as shown in (9).

(9) **From Dialect B:**

  (a) [hao **de**]   hong pan-zi
     good de$_{Mod}$ red   plate
     'good red plate(s)'

(b) [hao **de**]   yuan pan-zi
     good de$_{Mod}$ round plate
     'good round plate(s)'

(c) [xiao **de**]   yuan pan-zi
     small de$_{Mod}$ round plate
     'small round plate(s)'

The other way that my informants made the unacceptable examples in
(8a) and (8b) acceptable was by inserting the marker *de* between Adj
and *pan-zi* 'plate,' as shown in (10).

(10) (a) [hao hong **de**]   pan-zi
          very red   de$_{Mod}$ plate
          'very red plates'

     (b) [hao yuan **de**]   pan-zi
          very round de$_{Mod}$ plate
          'very round plates'

This possibility is due to the nature of *hao* in these nominal phrases. *hao*
is often used as a degree modifier like *very* in English. In the examples in
(10), *hao* no longer functions as an adjective but as an adjective modifier.
(10a) refers to plate(s) that is/are very red, and (10b) to plate(s) that
is/are very round. The strategy used in (10), inserting *de* between Adj's
and nouns, is not possible in examples like (8c), repeated here as (11a).
If we insert *de* between the adjective and the noun in (11a), the nominal
phrase becomes ungrammatical in both dialects, as in (11b) (cf. (6b)).

(11) (a) *xiao yuan pan-zi
           small round plate
           'small round plate(s)'

     (b) *[xiao yuan **de**]   pan-zi
            small round de$_{Mod}$ plate

Thus far, it is clear that there is dialectal variation between Dialects A
and B in terms of the number of possible *de*-less Adj's in the pre-N
position. Dialect A allows at most two *de*-less Adj's, while Dialect B
prefers one.[9] In the following subsection, I explore the possible number
of Adj's with *de* in the pre-N position.

[9] What have been discussed so far are cases in which the meanings expressed by
    de-less Adj's and the nouns are semantically compositional. For these cases, Di-

2.2.2. Adj's with *de*

Since S&S (1991, 565–6) have a number of examples consisting of two Adj's with *de* in the pre-N position, I assume it is acceptable to have two pre-N Adj's in their dialects. Examples are as follows:

(12) (a) [xiao **de**] [lü **de**] huaping
      small de$_{Mod}$ green de$_{Mod}$ vase
      'small green vase(s)'

   (b) [hao **de**] [yuan **de**] panzi
       good de$_{Mod}$ round de$_{Mod}$ plate
       'nice round plate(s)'

To my Taiwanese informants, these examples sound unnatural. The problem is the second *de* from the left, i.e., the one close to the noun, which

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alect B prefers one *de*-less Adj. There are some other cases in which *de*-less Adj's and the noun have been lexicalized. In other words, the meanings of *de*-less Adj's and the nouns cannot be computed in a standard compositional way. For those cases, multiple *de*-less Adj's are possible as shown in (i) from Xu–Liu (1999, 99; cited in Paul 2003, 22).

(i) da zhong xiao xue
     big middle small study
     'educational institutions (i.e., primary school, middle school, and university)'

In (i), *da-zhong-xiao-xue* refers to all educational institutions. It does not refer to the schools whose sizes are big, middle, and small. The example in (ii) refers to elementary schools, not schools that are small. Elementary schools are not necessary small in size. Some elementary schools might be bigger than some universities.

(ii) xiao xue
     small study
     'elementary schools'

One has to know that *xiao* 'small' and *xue* 'study' together refer to elementary schools and that (iii) refers to middle schools and (iv) to universities before one can compute the meaning in (i).

(iii) zhong xue
      middle study
      'high schools'

(iv) da xue
     big study
     'universities'

The meaning in (i) can be computed compositionally but through a special kind of composition, perhaps disjunction.

sounds redundant to their ears. When my informants were asked to make the example in (12a) sound natural, they produced the following examples.

(13) (a) [xiao **de**]   [lü]   huaping
           small de$_{Mod}$ green vase
           'small green vase(s)'

      (b) [lü   **de**]   [xiao] huaping
           green de$_{Mod}$ small vase
           'lit. green small vase(s)'

In (13), we see that one adjective is *de*-marked, and the other is not. It does not matter which one gets *de*-marked, *xiao* 'small' or *lü* 'green', as long as the one that has a *de* marker precedes the one without a *de* marker.

Again, the dialect reported by Sproat and Shih allows more than one Adj with *de* in the pre-N position, while the dialect I study here prefers a single Adj with *de*.

2.2.3. A note

According to sections **2.2.1–2.2.2**, one might conclude that the dialect spoken in Taiwan only allows the following structure:

(14) [Adj$_1$ *de*] [Adj$_2$] N

This conclusion/prediction is not entirely true. It is true that the combination in (14) is the most natural way of expressing a noun with two modifiers. However, there are other possibilities, which I elaborate below and in section **2.3.**

What I have shown so far is that (14) is the most natural way of dealing with two Adj's in Dialect B. Take the example in (12a) for illustration. When *lü* 'green' and *xiao* 'small' modify the noun *vase* at the same time, Dialect B has the option of putting *lü* 'green' in the Adj$_1$ position as in (13b) or *xiao* 'small', as in (13a). There is a semantic distinction between (13a) and (13b). However, this distinction is only apparent when they occur in contrastive constructions. For example, if all the vases are green but have various sizes, in order to pick out the intended one(s), the nominal phrases in (13a) is likely to be used. On the other hand, if all the vases are small in sizes but differ in colors, then (13b) would be used instead of (13a). However, when either (13a) or

(13b) is used alone, the distinction is sometimes hard to detect. I suspect that sometimes speakers might use either order without intending a difference in meaning similar to Huang's (1982, 68) observations about the semantic difference between the pre-N and pre-D cases (see footnote 2). I elaborate the semantic distinction between (13a) and (13b) in section **4.**

The question that arises is what if a noun is modified by more than two Adj's. This kind of nominal phrase presumably looks like the one in (15a) in dialect(s) that accept multiple juxtaposed adjectives. (15a) is extremely awkward in the dialect I study. Therefore, to convey the meaning of (15a), one can resort to periphrasis involving full sentences. In (15b–f), I provide some such strategies (see also footnote 7).

(15) (a)$^{???}$zhe ge [xiao **de**]   [lü   **de**]   [yuan **de**]   huaping
             this cl   small de$_{Mod}$ green de$_{Mod}$ round de$_{Mod}$ vase

    (b)   zhe ge [xiao (**de**)]   huaping [you [lü]   you [yuan]]
             this cl   small de$_{Mod}$ vase   both green and round
             'This small vase is both green and round.'

    (c)   zhe ge [lü   (**de**)]   huaping [you [xiao] you [yuan]]
             this cl   green de$_{Mod}$ vase   both small and round
             'This green vase is both small and round.'

    (d)   zhe ge [yuan (**de**)]   huaping [you [lü]   you [xiao]]
             this cl   round de$_{Mod}$ vase   both green and small
             'This round vase is both green and small.'

    (e)   zhe ge [xiao **de**]   [lü   huaping]   [hen yuan]^{10}
             this cl   small de$_{Mod}$ green vase   very round
             'This small green vase is (very) round.'

    (f)   zhe ge [you [xiao] you [lü]   **de**]   [huaping] [hen yuan]
             this cl   both small and green de$_{Mod}$ vase   very round
             'This small and green vase is (very) round.'

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[10] The presence of *hen* 'very' is obligatory when scalar adjectives and some absolute adjectives are used as a sole predicate. Li and Thompson (1989) note that when this adverbial modifier is not heavily stressed, its adverbial meaning is bleached. In other words, *hen* 'very' can be semantically empty. Hence, the sentence in (i) is ambiguous between two meanings.

(i)   na   ge guojia   [*(hen) minzhu]
        that cl country   very democratic
        Reading 1: 'That country is very democratic.'
        Reading 2: 'That country is democratic.' (*op.cit.*, 143 (168b))

It is puzzling why *hen* is obligatory when it does not contribute any semantic interpretation. I am not in a position to answer this question now but simply note it and leave it for future research.

The sentences in (15b–d) employ the same strategy to deal with three *de*-marked Adj's: placing one with or without *de* in the pre-N position and coordinating the other two in the predicate position. The sentence in (15e) contains one pre-N *de*-marked Adj, one pre-N *de*-less Adj, and one in the predicate position. Finally, we can also coordinate two pre-N *de*-marked Adj's and place one in the predicate position as in (15f). Notice that when adjectives appear in the predicate position, the *de*-marker disappears. Comparing the coordinating string in (15f) to the one in (15d), we see that the one in the pre-N position (15f) requires a *de* marker at the rightmost edge of the coordinating phrase. Without the marker, the sentence is ungrammatical. In contrast, the coordinating string in (15d) appears in the predicate position and the marker *de* is not allowed. If the marker is present, the sentence is unacceptable. This is true even when a predicate Adj is not coordinated, as in (15e, f).[11]

In section **2.2**, I have shown the possible number of *de*-Adj's and *de*-less Adj's in a nominal phrase in both Dialects A and B. In section **2.3**, I provide information regarding the ordering restriction among adjectives in Mandarin.

2.3. Ordering restrictions

It has been noted in the literature that in certain languages when multiple adjectives co-occur in a nominal phrase, they are subject to ordering restrictions. In this section, I briefly introduce the fact in English and explore the restrictions in Mandarin.

2.3.1. English

English pre-nominal Adj's are subject to an ordering restriction when there is no special stress on any of the adjectives (e.g., Bloomfield 1933; Whorf 1945; Lance 1968; Vendler 1968, among many others). The hierarchy is given in (16). $A > B$ means that B is closer to the noun than A.

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[11] Applying the sentential periphrasis strategy is just one way to make examples like (15a) better. The reviewer points out that the conjunctive *you* can be used to conjoin more than two Adjs, which is true. The example will look like the following:

(i)　zhe　ge　[you　[xiao]　you　[lü]　　you　[yuan]　**de**]　　[huaping]
　　　this　cl　both　small　and　green　and　round　de$_{Mod}$　vase
　　　'this small, green, and round vase'

(16) Quality > Size > Shape > Color > Provenance

According to this hierarchy, when there are a Color Adj and a Size Adj, the Color Adj is closer to the noun. The following examples are taken from S&S (1991, 565 (1a–c)) to demonstrate the ordering restriction.

(17) **Size > Color > Provenance**
- (a) small green Chinese vase
- (b) *green small Chinese vase
- (c) *green Chinese small vase

(18) **Quality > Shape**
- (a) nice round plate
- (b) *round nice plate

(19) **Size > Shape**
- (a) small square table
- (b) *square small table

2.3.2. Mandarin

It has been suggested that the well-known ordering restriction observed in English is not found in *de*-modification but is found in *de*-less modification (e.g., S&S 1987; 1991).[12] The following examples again are taken from S&S (1991, 565 (2a–b) and (4a–b)) with a slight modification on the gloss and bracketing. As shown in (20)–(21), *de*-marked Adj's in each nominal phrase can have different ordering, and the nominal phrase remains grammatical.

(20) *de*-modification: free ordering
- (a) [xiao **de**]   [lü   **de**]   huaping
  small de$_{Mod}$ green de$_{Mod}$ vase
  'small green vase(s)'
  Size > Color

- (b) [lü   **de**]   [xiao **de**]   huaping
  green de$_{Mod}$ small de$_{Mod}$ vase
  Color > Size

(20′) Judgments from Dialect B
- (a′) ☹:   [xiao **de**] [lü **de**] huaping
- (a″) OK: [xiao **de**] [lü]   huaping

- (b′) ☹:   [lü **de**] [xiao **de**] huaping
- (b″) OK: [lü **de**] [xiao]   huaping

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[12] In section **4**, I present a number of counterexamples to show that the ordering restriction found in *de*-less modification is more complex than what S&S observe and that the well-known ordering restrictions observed in English are not enough to capture the facts in Mandarin.

(21) *de*-modification: free ordering
    (a) [hao **de**]   [yuan **de**]   panzi
       good de$_{Mod}$ round de$_{Mod}$ plate
       'nice round plate(s)'
       Quality > Shape

    (b) [yuan **de**]   [hao **de**]   panzi
       round de$_{Mod}$ good de$_{Mod}$ plate
       Shape > Quality

(21′) Judgments from Dialect B
    (a′) ☹: [hao **de**] [yuan **de**] panzi
    (a″) OK: [hao **de**] [yuan]   panzi

    (b′) ☹: [yuan **de**] [hao **de**] panzi
    (b″) ☹ [yuan **de**] [hao]   panzi

In contrast, *de*-less modification obeys a certain order in Dialect A. (22a) is acceptable to the native speakers of Dialect A, but (22b) is not. The same pattern is found in (23).

(22) *de*-less modification: fixed ordering
    (a) [xiao] [lü]   huaping
       small green vase
       'small green vase(s)'
       Size > Color

    (b) *[lü]   [xiao] huaping
       green small vase
       Color > Size

(22′) Judgments from Dialect B
    (a′) ☹: [xiao] [lü]   huaping
           small green vase

    (b′) ☹: [lü]   [xiao] huaping
           green small vase

(23) *de*-less modification: fixed ordering
    (a) [hao] [yuan] panzi
       good round plate
       'nice round plate(s)'
       Quality > Shape

    (b) *[yuan] [hao] panzi
       round   good plate
       Shape > Quality

(23′) Judgments from Dialect B
    (a′) ☹: [hao] [yuan] panzi
           good round plate

    (b′) ☹: [yuan] [hao] panzi
           round good plate

As shown in (20′)–(23′), the ordering restriction observed in English applies trivially to these *de*- or *de*-less examples in Dialect B because Dialect B does not prefer more than one *de*-modifier or *de*-less modifier in a nominal phrase. If the number of Adj's is always one, then there is no problem in terms of ordering restrictions.

    What about a situation when *de*-modification and *de*-less modification co-occur? In that case, the ordering between these two elements is fixed. However, this ordering restriction is not constrained by the hierarchy in (16). The only possible ordering is to have *de*-modification preceding *de*-less modification, as demonstrated in the following examples (S&S 1991, 571 (15)).

(24) (a) [hei **de**]   [xiao] shu
       black de$_{Mod}$ small book
     'small black book(s)'

   (b) *[xiao] [hei **de**]   shu
       small black de$_{Mod}$ book
     'small black book(s)'

   (c) ✓[Adj **de**] [Adj] N
      *[Adj] [Adj **de**] N

The example in (24a) is grammatical because the *de*-marked Adj precedes the *de*-less Adj. In contrast, when these two Adj's reverse the order, the nominal phrase is ungrammatical, as in (24b). There is another case in which free ordering between Adj's is found. Examples are as follows:

(25) (a) [you [hao] you [yuan] **de**]   panzi   (Quality > Shape)
       both good and round de$_{Mod}$ plate
     'both nice and round plate(s)'

   (b) [you [yuan] you [hao] **de**]   panzi   (Shape > Quality)
       both round and good de$_{Mod}$ plate
     'both round and nice plate(s)'

   (c) ✓*[you* [Adj$_1$] *you* [Adj$_2$] *de]* N
     ✓*[you* [Adj$_2$] *you* [Adj$_1$] *de]* N

(26) (a) [you [piaoliang] you [gao] **de**]   nühai   (Quality > Size)
       both pretty   and tall de$_{Mod}$ girl
     'both pretty and tall girl(s)'

   (b) [you [gao] you [piaoliang] **de**]   nühai   (Size > Quality)
       both tall and pretty   de$_{Mod}$ girl
     'both tall and pretty girl(s)'

   (c) ✓*[you* [Adj$_1$] *you* [Adj$_2$] *de]* N
     ✓*[you* [Adj$_2$] *you* [Adj$_1$] *de]* N

When there is a coordinator between two Adj's, *de* only occurs after the second Adj as in (25)–(26), and the word order between these two Adj's does not matter. This construction is similar to the [*both... and...*] construction in English:

(27) (a) [both small and quiet] computer

   (b) [both cheap and nice] trip

   (c) [both kind and loving] girl

To sum up, in Dialect A of Mandarin, *de*-modification is not subject to ordering restrictions but *de*-less modification is. On the other hand, the phenomenon of ordering restrictions among Adj's is not testable in Dialect B due to the preference for only one Adj in the pre-N position.[13]

3. Literature review

In this section, I review three previous studies concerning *de*- and *de*-less modification. The first two are S&S (1987; 1991); the third one is Paul (2003).

[13] In section **2.3**, I report, from literature, how the well-known English ordering restriction is applied in Mandarin *de*-less modification, but not in *de*-modification. The main difference between these two types of modification is the presence of the *de* marker, and the reviewer suggests that some phonological factors (such as the different syllabic patterns of adjectives) that cause the omission of the marker need to be addressed. Why is *hong hua* 'red flower' fine without *de* as in (i), but **xinxian hua* 'fresh flower' not fine as in (ii)?

(i) hong (de) hua
    red   de$_{Mod}$ flower
    'red flower(s)'

(ii) xinxian *(de) hua
    fresh   de$_{Mod}$ flower
    'fresh flower(s)'

The examples in (i-ii) seem to suggest: (i) when the adjectives are monosyllabic, it is fine to omit the *de* marker, (ii) when the adjectives are polysyllabic, the *de* marker cannot be omitted. However, the following examples do not support the above suggestions:

(iii) xian (*de) hua
     fresh   de$_{Mod}$ flower
     'fresh flower(s)'

(iv) shuijing (de) hua
     crystal   de$_{Mod}$ flower
     'crystal flower(s)'

In (iii), *xian* 'fresh' is monosyllabic, and the presence of *de* between *hua* 'flower' and *xian* 'fresh' is not allowed. On the other hand, the adjective in (iv), *shuijing* 'crystal', is polysyllabic, and the marker is optional.

    I agree that syllabic patterns play an important role in Mandarin construction; however, I do not think *hong de hua* and *hong hua* in (i) have the same syntactic construction. In other words, I do not think the *de* marker is simply omitted in *de*-less modification. I argue that *de*-modification and *de*-less modification have distinct syntactic structures, which I elaborate in section **4.**

3.1. Sproat–Shih (1987): pre-Nominal adjectival ordering in English and Mandarin

S&S argue that there are two distinct types of modification, "direct" and "indirect" modification, which they claim are universal strategies involving different syntactic and semantic behaviors. They associate Mandarin *de*-modification with the "indirect" type and *de*-less modification with the "direct" one. They argue that indirect modification has the same syntax and semantics as relative clauses, partly because they both involve the same marker *de* (cf. (1)–(2)). They further claim that if *de* modifiers are relative clauses, then the Adj's in them must be in the predicate position. So, these Adj's should be able to occur in the predicate position. On the other hand, if an adjective cannot appear in the predicate position, then it should not be able to occur as a pre-Nominal *de* modifier though it is possible to have this Adj function as *de*-less modification. The only example they use to support their claim is *former* in English and *qian* 'former' in Mandarin. They demonstrate that neither *former* in English nor *qian* 'former' in Mandarin can appear in the predicate position as in (28a) and (29a) respectively, though they can appear pre-Nominally, as in (28b, 29b) (S&S 1987, 476 (35)–(36)):

(28) (a) *This president is **former**.

    (b) the **former** president

(29) (a) *zhe ge zongtong **qian**
       this cl president former

    (b) **qian** zongtong
       former president
       'former president(s)'

They further suggest that since *qian* 'former' cannot occur in a predicate position, as in (29a), it must not be in a relative clause when it occurs pre-Nominally. Hence, it should not be able to occur as a *de* modifier. They use the following example to support their claim (S&S 1987, 477 (37)):

(30) *qian **de** zongtong
    former de president

In addition, S&S argue that direct modification in Mandarin is essentially compounding and involves the formation of nouns from other nouns and

that this process is subject to ordering restrictions. This idea is clearly represented in their examples in (31) (S&S 1987, 466 (3a), (4)). As shown in (31b), *lü* 'green' and *hua-ping* 'vase' form a noun, and then *xiao* 'small' combines with *lü huaping* 'green vase' to form another noun.

(31) (a) xiao lü   hua-ping
          small green vase
          'small green vase(s)'

     (b) [$_N$ xiao [$_N$ lü   hua-ping $_N$]
              small   green vase
          'small green vase(s)'

They observe that ordering restrictions are not found in *de*-modification, but they are in *de*-less modification. They further suggest that adjectival ordering restrictions are restricted to direct modification-like constructions cross-linguistically.

Following previous work by other authors (e.g., Martin 1969; Danks –Glucksberg 1971), S&S argue that adjectival ordering has a basis in cognitive processing: the more comparison necessary, the further to the left the corresponding adjective is placed. For example, they argue that absolute terms such as *red* involve less computation than relative terms such as *large* because the latter require comparisons with other items while the former do not. Hence, in ordering, the size term *large* would appear to the left of the color term *red*. From a different point of view, the more 'apparent' (or absolute) the Adj's are, the closer they will be to the nouns.

Furthermore, in order to account for the fact that adjectives of provenance are placed fairly far to the right in English, even to the right of color terms (e.g., *large red Chinese vase, *Chinese large red vase*), S&S claim that adjectives of provenance serve as indicators of taxonomy since ordering involving color terms and adjectives of provenance cannot be derived from the comparison scale they advance. They suggest that *large vases*, *round vases*, *red vases* and so forth would not typically be understood as indicators of taxonomy though they might be able to under appropriate conditions.

S&S suggest that, in general, adjectives which are more 'apparent' (less comparison required) such as shape, color, and the more taxonomic adjectives (e.g., adjectives of provenance) are predicative, whereas adjectives like size and quality, which are less 'apparent,' tend to be non-predicative. Having this dichotomy in mind, S&S claim that the number

limitation, at most two *de*-less modifiers, in the dialect they study is because the dialect employs an "avoidance strategy", which has been grammaticalized, to avoid having two 'predicative' or two 'non-predicative' Adj's in *de*-less modification. Recall the ordering hierarchy:

(32) $\underline{\text{Quality} > \underline{\text{Size}} > \text{Shape} > \text{Color} > \text{Provenance}}$
            Group A   Group B

If we draw a line between Size and Shape and assume that the "avoidance strategy" is at work, it is clear that any three Adj's will have two Adj's from the same group. That is how S&S account for the limitation of having at-most-two *de*-less modifiers.

Finally, S&S conclude the paper with two remaining questions: Why should more apparent Adj's be ordered closer to the head than less apparent Adj's? Why should the presence of ordering be sensitive to the kind of modification involved?

3.2. Sproat–Shih (1991): The cross-linguistic distribution of adjective ordering restrictions

In this paper, S&S maintain their claim that adjectival modification cross-linguistically breaks down into two types, direct vs. indirect modification, and offer an account for the different behaviors observed in these two kinds of modification. They argue that the differences lie in the manner of θ-role assignment. They argue that in direct modification the adjective assigns its θ-role(s) directly to its sister as shown in (33) (S&S 1991, 568 (7a)):

(33)

$$N^z$$

$$A \xrightarrow{\theta\text{-role(s)}} N^y$$

$$A \xrightarrow{\theta\text{-role(s)}} N^x$$
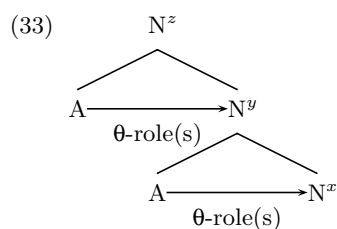
On the other hand, in indirect modification, θ-role(s) are associated with that of its modifiee indirectly by co-indexation. They preserve their (1987) proposal that the *de*-modification in Mandarin is a relative clause and further argue that Adj's behave like intransitive verbs. With the

θ-role(s) assignment idea they have in mind, S&S argue that Adj's assign their θ-roles to phonologically empty variables within modifier clauses. These variables are bound by operators which are co-indexed with the heads of the entire noun phrases. For illustration, I repeat S&S's diagram in (34) (S&S 1991, 567 (6)):

(34)

$$N^y$$

CP N^x_j

IP O_j

e_j ← A
θ-role(s)
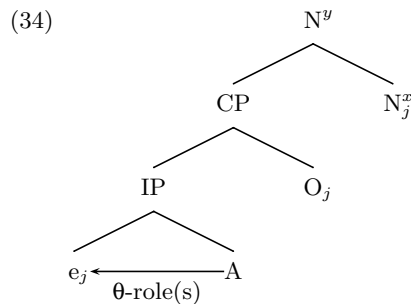
In order to account for the fact that direct modifiers cannot modify DP's, S&S argue that direct modification must occur within the scope of specifier items such as *the* or *John's* because specifiers discharge the θ-role of a noun and make the noun unavailable for further θ-role assignment. S&S mention that they follow Zhu (1956)'s proposal that direct modifiers only modify word-level projections of N, whereas modifiers with *de* modify higher projections.

As for the ordering restrictions, S&S argue that the semantic property of absoluteness of Adj's gives a clear first cut at predicting the restrictions. Again, they end the paper with the same questions: Why should more apparent Adj's be ordered closer to the head than less apparent Adj's? Why should the presence of ordering be sensitive to the kind of modification involved?

3.3. Paul (2003): Adjectival modification in Mandarin Chinese and related issues

In this paper, Paul argues against the idea that *de*-modification is to be analyzed as a relative clause (e.g., S&S 1987; 1991; Duanmu 1998; Simpson 2001). In addition, she argues for the idea that *de*-less modification should be treated as phrasal elements. She presents a number of examples to show that S&S's claim, which is based on *qian* 'former', is not well-grounded. Paul demonstrates that there are many Adj's that cannot occur in the predicate position by themselves. When they appear

in the predicate position, they need to co-occur with the copular *shi* and a particle *de* as in (35a) and (36a). Further, they can function as *de* modifiers (Paul 2003, 4 (4a, b) with a slight modification of the gloss).[14]

(35) (a) zhe ge panzi *(shi) fang   *(de)
       this cl plate   be   square   de
       'This plate is square.'

   (b) ta   mai-le   [$_{DP}$ yi ge fang **de**   panzi]
        s/he buy-perf   one cl square de$_{Mod}$ plate
        'He bought a square plate.'

---

[14] This special construction *shi. . . de* in Mandarin contains a marker *de*, which is a homophone of the nominal modifier marker and the possessive marker. This morpheme *de* creates a lot of confusion. For example, the example in (35a) could be parsed in a different way as follows:

(i) zhe ge panzi shi [fang   de]
   this cl plate be square de
   'This plate is square.'

For supports of the claim that all predicative Adj's are relative clauses, this parse will be favored and the bracketed string will be taken as an instance of RC's. One might wonder why the bracketed string cannot be taken as a predicative Adj but a RC. The reason is that the presence of the copula and *de* are unexpected. Recall that when predicative adjectives appear in the predicate position as in (15b–f), there is no overt copula, and the *de* marker after Adj's is not present. Hence, this bracketed string cannot be an adjective predicate. Then the other choice would be a RC. However, this approach does not seem to be on the right track, either.

If [fang de] in (i) is a relative clause and *de* is the obligatory RC marker (cf. (1)–(4)), then *fang* would be the adjectival predicate. Then it is puzzling why (ii) is ungrammatical. Recall that when Adj's are in the predicate position, *hen* 'very' is obligatory (cf. footnote 10).

(ii) *zhe ge panzi shi [[**hen** fang]   de]
    this cl plate be   very square de

Furthermore, it has been noted in the literature that when RC's appear in the object position, extracting elements out of RC's—such as through topicalization—leads to ungrammaticality, as in (iii) (e.g., Shi 1994; Simpson–Wu 2002).

(iii) *Li You, wo hai mei you jian guo [$_{NP}$ [$_{IP}$ gan sha **t$_i$**] de]   (Shi 1994)
     Li You, I   still not have meet asp   dare kill   de$_{Mod}$
     Intended: 'I still haven't met any man who dares to kill Li You.'

(iv) Wang Xiaojie, wo qunian [shi   [jian guo **t$_i$**] de] (*idem.*)
     Wang Miss   I   last   year be   meet asp de
     'It is seeing Miss Wang that I did last year.'

In contrast, topicalization out of a string occurring within the *shi. . . de* construction appears to be possible as in (iv). The material between *shi. . . de* has the 'focus', 'emphasis' function. See Li–Thompson (1989); Shi (1994), and Simpson–Wu (2002) for detailed discussion.

(36) (a)   zhe ge panzi *(shi) lü   *(de)
          this cl plate   be green   de
          'This plate is green.'

    (b)   ta   mai-le   [$_{DP}$ yi ge lü   **de**   panzi]
          s/he buy-perf   one cl green de$_{Mod}$ plate
          'He bought a green plate.'

Paul further shows that non-predicate Adj's are not limited to *de-* or *de*-less modification. There are a large number of Adj's that cannot occur in the predicate position by themselves but can appear as *de-* or *de*-less modifiers. This clearly falsifies S&S's claim that if an Adj cannot occur in the predicate position, then it cannot be a *de* modifier.

Paul also points out that the example (30), repeated here as (37), that S&S use to support their claim is not adequate.

(37) *qian   **de** zongtong
       former de president

S&S argues that *qian* 'former' cannot occur in the predicate position; therefore, it cannot function as a *de* modifier. Paul shows that (37) is unacceptable simply because *qian* 'former' is a bound morpheme, compared to its bisyllabic counterpart *yiqian* 'former,' as shown in (38) (Paul 2003, 5, footnote 7, (i)).[15]

(38) Beijing daxue   **yiqian de** xiaozhang
     Beijing university former de chancellor
     'the former chancellor of Beijing University'

Paul also argues against the idea that *de*-less modification is not phrasal. She suggests that both *de-* and *de*-less modification structures are phrasal. Her argument is based on some comparative sentences involving both kinds of modification, which I provide further discussion of in section **4.** As for the function of the marker *de*, she suggests that it is a functional head which divides a nominal phrase into two domains. Adj's that appear below *de* are interpreted as a defining property/characteristic, i.e., the case of *de*-less modification, whereas Adj's above *de* are interpreted as a temporary property, i.e., the case of *de*-modification. However, Paul

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[15] Note that *yiqian* 'former' cannot function as a predicative Adj as in (i):

   (i) *Beijing daxue   xiaozhang hen **yiqian**
       Beijing university chancellor very former

does admit that not every property can be presented as a defining characteristic through *de*-less modification. She points out that the semantic properties of the head nouns also play a role. Paul agrees with Bolinger's (1967) comment that the acceptability of a modifier in the pre-Nominal position is subject to poorly understood restrictions. The following examples are from Bolinger (1967). Paul points out that this state of affairs is also found in Mandarin.

(39) (a) your absent friend
     (b) *your present friend

(40) (a) deposited money
     (b) *withdrawn money

(41) (a) the then president
     (b) *the now president

3.4. Questions and a proposal

After reviewing these three studies of Mandarin adjectival modification, we see that there is no consensus on the morphological category and the syntactic status of *de*-less modification. S&S and some other researchers argue for a word status for *de*-less modification, whereas Paul suggests a phrasal status. The other syntactic issue that concerns these authors is whether *de*-modifiers are derived from relative clauses. On the semantic side, there are still no predictable ways of computing the meaning of a nominal phrase involving *de*-less modification, though there has been some discussion regarding the semantic differences between *de*- and *de*-less modification in the literature. In addition to these unsettled questions in the literature, there remain two questions that S&S raise: Why should more apparent Adj's be ordered closer to the head noun than less apparent Adj's? Why should the presence of ordering be sensitive to the kind of modification involved? In other words, why is *de*-less modification subject to ordering restrictions but not *de*-modification? Probing into these questions helps us to better understand the nature of *de*-modification and *de*-less modification. This sheds light on other related questions, such as why *de*-modification cannot intervene between a *de*-less Adj and the head noun.

The proposal I advance in this paper concerns the nature of the N head in Mandarin and the distinction between the nature of words

and that of phrases. Yang (2005) suggests that nouns realized at the
N head are concept-denoting nouns in the sense of Krifka et al. (1995).
Krifka proposes that concepts can have kinds as a subset and that both
concepts and kinds refer to abstract entities related to real objects. Al-
though concepts could be construed from scratch and do not need to be
well established in ontology, I argue that creating a new concept or sub-
concept still requires common ground among speakers and listeners and
involves individuals' conventional views. I further argue that the combi-
nation of the *de*-less element(s) and the noun creates a new concept or a
sub-concept term. The more *de*-less elements involved, the more complex
the concept will be, and the more intricate the common grounds needed.

Furthermore, I suggest that the reason that restrictions on the order-
ing of multiple adjectival modifiers are applied in *de*-less modification but
not in *de*-modification is because the combination of *de*-less Adj(s) and
the head noun form a morphosyntactic word (MWd) under the N head in
the sense of Embick–Noyer (2001), and intra-word constructions usually
do not have as much flexibility as phrasal elements such as AdjP's. That
is why *de*-less Adj's are subject to strict (unpredictable) ordering con-
straints but *de*-modification is not. I argue that Adj's followed by *de* are
phrasal and that *de*-modification involves a phrasal adjunction structure.
That is why *de*-modification has freer syntax than *de*-less modification
does. Based on the different nature of word and phrasal categories, we
expect that a phrasal element cannot appear in the morphosyntactic word
domain. That is why Adj's with *de* are not allowed to appear between two
de-less Adj's or between a *de*-less Adj and a noun that form a subword
relationship.

With a better understanding of the structural differences between
de- and *de*-less modification, the puzzling phenomena observed in these
two modification constructions falls out naturally. In the following sec-
tion, I provide more data and discussion which I hope make the current
grammatical status of *de*- and *de*-less modifiers clearer.

4. Analysis

In what follows, I first provide data to show that the ordering restrictions
found in the *de*-less construction are much more complex than what has
been reported. I then discuss a number of tests for the notion of word-
hood and argue that *de*-less elements and nouns should be analyzed as
word formation, not as the standard adjectival modifiers and modifiee

relationship. In addition, I examine the syntactic constructions of *de*-modification and *de*-less formation.

4.1. Revisiting the ordering restrictions in *de*-less modification

In this section, I provide examples to show that there are ordering restrictions in *de*-less modification; however, these restrictions are much more intricate than what S&S (1987; 1991) have reported.

S&S demonstrate that, like the English adjectival system, *de*-less modification in Mandarin is also subject to the adjectival hierarchy. I repeat the hierarchy they assume here as (42) (cf. their examples in (22)–(23)).

(42) Quality > Size > Shape > Color > Provenance

Closer investigation shows that ordering restrictions in *de*-less modification are far more complex than what this hierarchy predicts. First, according to (42), adjectives of provenance are placed to the right of Color Adj's in English. The examples in (43a-c) are from S&S (1987, 469 (12)).

(43) (a) *Chinese large red vase

    (b) ^{??}large Chinese red vase

    (c) large red Chinese vase

    (d) (i) ✓Size > Color > Provenance
        (ii) ^{??}Size > Provenance > Color
        (iii) *Provenance > Size > Color

(43a) is ungrammatical, and it can be accounted for by the word order between the adjective of provenance, *Chinese,* and the other Adj's in the phrase. S&S assign two question marks to the example in (43b) because the Provenance Adj appears before the Color Adj. The nominal phrase in (43c) is the preferred one because the order of the Adj's conforms to the ordering in (42). The ordering hierarchy in (42) predicts the grammaticality and ungrammaticality of the examples in (43) but not the following Mandarin examples.

(44) (a) Meiguo   **qing** pingguo
        American green apple
       'American green apple(s)'

 (b) ***qing** Meiguo pingguo
   green American apple

 (c) ✓Provenance > Color
   *Color > Provenance

(45) (a) wo juede [Meiguo **da** dushi] li de jiaotong bu tai hao
     I feel America big city in de traffic neg very good
   'In my opinion, traffic in the big cities in America is not very good.'

 (b) *wo juede [**da** Meiguo dushi] li de jiaotong bu tai hao
    I feel big America city in de traffic neg very good

 (c) ✓Provenance > Size
   *Size > Provenance

The examples in (44) and (45) show that the orderings between the provenance adjective and the color adjective in (44) and the provenance adjective and the size adjective in (45) do not obey the adjectival hierarchy in (42).

  Further, S&S show that in English when Adj's of Size, Shape, and Color co-occur in a nominal phrase, they follow the adjectival hierarchy, as demonstrated in the example in (46) (S&S 1987, 469 (9)):

(46) (a) large round red apple

 (b) *round large red apple

 (c) *large red round apple

 (d) ✓Size > Shape > Color
   *Shape > Size > Color
   *Size > Color > Shape

There are a number of Mandarin examples that involve color and size Adj's and display ordering restrictions. However, the ordering is not what (42) predicts, as shown in the following examples:

(47) (a) **baise**   chang/duan ku
    white-color long/short pant
    lit: 'white long/short pant(s)';'white pants/shorts'

 (b) *chang/duan **baise**   ku
    long/short white-color pant

 (c) ✓Color > Size
   *Size > Color

(48) (a) yi   ge [**baise** da kaoxiang]
      one cl   white big oven
      'a big white oven'
      (from Academia Sinica Balanced Corpus of Modern Chinese 2005)

   (b) *yi   ge [da **baise** kaoxiang]
       one cl   big white oven

   (c) ✓Color > Size
      *Size > Color

In both (47) and (48), the acceptable ordering is to have the color Adj's precede the size Adj's as demonstrated in (47a) and (48a), which is unexpected according to the hierarchy in (42). I have illustrated that the hierarchy in (42) does not sufficiently account for the Mandarin data provided here. I am not arguing that the hierarchy in (42) is wrong.

In addition to the examples provided above, there are other examples that present a different kind of unpredictability. The examples in (49) and (50) are about *wan* 'bowl'. Comparing (49a) to (49b), it seems that these two *de*-less modifiers, *xiao* 'small' and *ci* 'porcelain', follow the ordering of Size > Material.[16]

(49) (a) yi   ge [xiao **ci**   wan]
      one cl   small porcelain bowl
      'a small porcelain bowl'

   (b) *yi   ge [**ci**   xiao wan]
       one cl porcelain small bowl

   (c) ✓Size > Material
      *Material > Size

However, when the Adj *ci* 'porcelain' is replaced with *boli* 'glass', the Size > Material ordering is not acceptable anymore, as shown in (50a).

(50) (a) *yi   ge [xiao **boli** wan]
      one cl   small glass bowl

   (b) i   ge [**boli** xiao wan]
      one cl   glass small bowl
      'a small glass bowl'

---

[16] S&S (1987) mention that it is less clear where material Adj's fit in though in English it seems that they tend to be ordered after color Adj's, as in (i).
  (i) (a) vermilion wooden block
     (b) [?]wooden vermilion block

(c) *Size > Material
    ✓Material > Size

(50a) is exactly like (49a) except for the types of materials involved. One
is porcelain; the other is glass. Unexpectedly, (50a) is not acceptable,
while (49a) is.

What I have shown in this section are as follows: (i) There are
ordering restrictions in *de*-less modification based on the choice of Adj's
and nouns. (ii) Contrary to S&S's observation, the restrictions do not
entirely follow from the well-known adjectival hierarchy in (42). I do
not intend to offer an account for these idiosyncratic phenomena but
only hope to present a more complete picture of the ordering restriction
phenomenon for future research.

In addition to the ordering restrictions in *de*-less modification, an-
other syntactic issue that concerns researchers is whether *de*-less mod-
ifiers are nouns that are part of the formation of compounding (from
nouns to other nouns) (S&S 1987; 1991) or a phrasal element, not words.
If neither, what kind of syntactic category are *de*-less elements? In the
following sub-sections, I focus on these questions and argue that *de*-less
elements and the noun should be analyzed as a word. I further show that
the term *de*-less "modification" is not adequate and does not capture the
nature of the construction. I begin the discussion with what I take to
be a "word".

4.2. Tests for words

In Mandarin, each individual character is one syllable in length, and in
writing, characters are separated by space like the word space in Eng-
lish writing.[17] This space between characters gives rise to a couple of
crucial questions: What is a "word"? Does a character equal a word in
Mandarin? These questions have prompted a great deal of discussion in
the literature (e.g., Chao 1968; Lü 1981; Huang 1984; S&S 1987; 1991;
Duanmu 1998, and many others). Several criteria have been proposed
to test whether a number of syllables which together form a meaningful

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[17] As the reviewer points out, this statement is almost true except in some Mandarin
dialects, the syllable *er* is often merged into the coda of the preceding syllable
in pronunciation. In this study, I will not try to account for this phonological
phenomenon but focus on the general morpho-syntactic pattern.

unit are considered a word or a phrase. Below I list some of the tests that I adopt in this study.

4.2.1. The lexical integrity hypothesis (LIH)

This hypothesis is proposed by Huang (1984) and states that no phrase-level rule may affect a proper subpart of a word. Relevant phrasal tests for adjectival and nominal constructions include the conjunction test, the movement test, and the adverbial test. These tests are discussed below and applied to cases of *de-* and *de*-less modifiers.

4.2.2. Conjunction Reduction test

Proposed by Huang (1984), the Conjunction Reduction test can be applied to phrases but not to words. In (51a), we have two strings that have the [[Adj *de*] N] structure, and in (51b), the first noun *shu* 'book' can be deleted or not pronounced.

(51) Duanmu (1998, 137 (2))

    (a) [jiu de   **shu**] gen [xin de   **shu**]
         old de_{Mod} book and new de_{Mod} book
         'old book(s) and new book(s)'

    (b) [[jiu de]   gen [xin de]] **shu**   (✓Conjunction Reduction)
         old de_{Mod} and new de_{Mod} book
         'old and new books'

On the other hand, the morpheme *che* 'car' in (52a), *huo-che* 'train' and *qi-che* 'automobile', cannot be omitted, as shown in (52b). A similar phenomenon is observed in the examples in (53).

(52) Huang (1984, 61)

    (a) [huo-che] gen [qi-che]
         fire-car   and gas-car
         'train(s) and automobile(s)'

    (b) *[huo gen qi] che   (*Conjunction Reduction)
         fire   and gas car

(53) Huang (1984, 61)

    (a) [New York] and [New Orleans]

    (b) *New [York and Orleans]   (*Conjunction Reduction)

In (54a), I provide a case in which the meaning of [good/bad student] seems to be compositional.[18] Still, the word *xuesheng* 'student' in (54a) cannot undergo Conjunction Reduction, as in (54b).

(54) (a) [hao   xuesheng] gen [huai xuesheng]
        good student   and bad student
        'good student(s) and bad student(s)'

    (b) *[hao gen huai] xuesheng   (*Conjunction Reduction)
        good and bad   student

What the examples in (51)–(54) demonstrate is that the combination of *de*-less elements and the nouns does not permit Conjunction Reduction (cf. 52)–(54), whereas that of *de*-modifiers and the nouns can (cf. (51)).[19]

4.2.3. Adverbial/degree modification test

Fan (1958) notes that [Adj *de* N] can take modifiers such as *hen* 'very' and *geng* 'more', but *de*-less cannot. The following examples are from Duanmu (1998, 150). As shown in (55a), *xin* 'new' is followed by the morpheme *de*, and various adjectival modifiers can precede the adjective *xin* 'new,' as in (55b–d). This indicates that there is an adjective phrase which is modified.

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[18] Here I do not imply that there is a semantic compositional derivation inside the internal word structure. I take the term 'compositional' here as the meanings of words that are transparent from the gloss.

[19] The reviewer provides two conjoined *de*-less examples: *hong gen lü deng* 'red and green lights' and *hong hua lü deng* 'red or green light'. These two examples do not sound natural in my dialect. The first example is acceptable to me if *de* is present after *lü* 'green' as in (ia) or after both *hong* 'red' and *lü* 'green' as in (ib). This is the same to the 'red or green light' example from the reviewer.

(i) (a) [hong gen lü   **de**]   deng
        red   and green de$_{Mod}$ light
      'red and green lights'

    (b) [hong **de**   gen lü   **de**]   deng
        red   de$_{Mod}$ and green de$_{Mod}$ light
      'red and green lights'

However, if the examples provided by the reviewer are grammatical in a certain dialect, then they will definitely be counter examples to the Conjunction Reduction test proposed by Huang (1984).

(55) **de-modification**

    (a) [xin de]   shu
          new de$_{Mod}$ book
      'new book(s)'

    (b) [**hen** [xin de]]   shu
          very new de$_{Mod}$ book
      'very new book(s)'

    (c) [**geng** [xin de]]   shu
          more new de$_{Mod}$ book
      'newer book(s)'

    (d) [**zheme** [xin de]]   shu
          so   new de$_{Mod}$ book
      'such new book(s)'

In contrast, when there is no *de* after *xin* 'new,' modification of *de*-less elements is not possible, as shown in (56b–d). The contrast between (55)–(56) suggests that [Adj *de*] is phrasal, but *de*-less is not.

(56) **de-less modification**

    (a) [xin] shu
          new book
      'new book(s)'

    (b) *[**hen** [xin]] shu
          very new book

    (c) *[**geng** [xin]] shu
          more new book

    (d) *[**zheme** [xin]] shu
          so   new book

4.2.4. XP substitution test

Fan (1958) observes that the noun after *de*-modification can be substituted for by a unit containing a demonstrative such as [Dem Numeral CL N], as in (57b).[20] The following examples are from Duanmu (1998), with a slight modification of the gloss and translation.

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[20] Fan (1958) also suggests that the noun after *de*-modification can be replaced by a unit consisting of a numeral and a classifier like [Numeral CL N] as in (i):

(57) **de-modification**

    (a) [xin de]   [shu]
         new de$_{Mod}$ book
      'new book(s)'

    (b) [xin de]   [**na**   **ben shu**]
         new de$_{Mod}$ that cl   book
      lit. 'new that book'; 'that new book'

On the contrary, the noun after *de*-less elements cannot be replaced by any phrasal element, as indicated by the ungrammatical examples in (58b, c). Duanmu calls this process XP substitution.

(58) **de-less modification**

    (a) [xin] shu
         new book
      'new book(s)'

    (b) *[xin] [san   ben shu]
         new three cl   book

    (c) *[xin] [na   ben shu]
         new that cl   book

The examples in (57)–(58) clearly show that the noun after *de*-less *xin* 'new' is not phrasal, while the one after *de*-modification is.

4.2.5. Productivity test

This test is based on the idea that lexical processes may be not fully productive, while syntactic processes should be fully productive. Duanmu (1998) suggests that if a phrasal rule like NP → [A N] exists in a language, then in that language most [A N] combinations should be possible.[21] On

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    (i) [xin de]   [san   ben shu]
         new de$_{Mod}$ three cl   book
      lit. 'new three books' (Duanmu 1998)

    However, this example is not grammatical to my informants and myself. In the dialect I study, AdjP's are not allowed to precede DP's headed by numerals. Even the example in (i) is ungrammatical, it does not affect what Fan is arguing. Fan's point is to show that nouns after *de*-modifiers are phrasal, and his argument is well supported by the grammatical example in (57b).

[21] Duanmu simplifies the rule for ease of discussion. The rule he has in mind is NP → [AP N] in the X-bar theory (*ibid.*, footnote 7).

the other hand, if most [A N] combinations are not possible, then [A N] is possibly not a phrase. He points out that [A N] is not productive in Mandarin. The following examples are cited in Duanmu (*ibid.*, 154), and they all have the [A N] pattern.

(59) (a) hua-ji dian-ying
            funny movie
            'funny movie(s)'

     (b) gui   dong-xi
            expensive article/thing
            'expensive article(s)/thing(s)'

     (c) duan xiu-zi
            short sleeve
            'short sleeve(s)'

     (d) bai   zhi
            white paper
            'white paper'

Zhu (1980) provides the following examples in (60) to further demonstrate that [A N] in Mandarin is not fully productive and many gaps remain. Those examples have the exactly parallel structure, [A N], and the same *de*-less elements as those in (59); however, the examples in (60) are not well-formed.

(60) (a) *hua-ji ren
            funny person
            'funny person(s)'

     (b) *gui   shou-juar
            expensive handkerchief
            'expensive handkerchief(s)'

     (c) *duan cheng-mo
            short silence
            'short silence'

     (d) *bai   shou
            white hand
            'white hand'

Furthermore, Duanmu shows that all the ungrammatical examples in (60) become good if *de* is inserted between the Adj's and the nouns:

(61) (a) hua-ji **de**   ren
          funny de$_{Mod}$ person
          'funny person(s)'

    (b) gui   **de**   shou-juar
          expensive de$_{Mod}$ handkerchief
          'expensive handkerchief(s)'

    (c) duan **de**   cheng-mo
          short de$_{Mod}$ silence
          'short silence'

    (d) bai   **de**   shou
          white de$_{Mod}$ hand
          'white hand'

Duanmu mentions that some adjectives in Mandarin (e.g., *da* 'big', *xiao* 'small', *xin* 'new', *jiu* 'old', *bai* 'white' and *chang* 'long') are quite productive in the [X N] structure because they can combine with a number of different nouns. I provide the following examples for demonstration.

(62) (a) [xiao] hua/ xiong/ xuesheng/ dao/ shou
             small flower bear   student   knife hand
          'small flower(s)/bear(s)/student(s)/knife(s)/hand(s)'

    (b) [xin] shu/ che/ shi/ ban/   yifu
            new book car   style version clothes
          'new book(s)/car(s)/style(s)/version(s)/clothes'

    (c) [bai]   haibao/ bu/ yu/ mifan/ zhi
            white seal   cloth jade rice   paper
          'white seal(s)/cloth/jade(s)/rice/paper'

Even though the examples in (62) seem to suggest that [X N] is a productive process, X's that can combine with many different nouns are in fact limited.

   Based on the tests and the examples demonstrated in section **4.2**, it is clear that *de*-less elements are not phrasal, but Adj's with the *de* marker are. The question arises as to what kind of syntactic category the so-called *de*-less elements are. In the following sub-section, I discuss the formal definition of 'word' that I adopt in this study and argue that these *de*-less elements are syntactically **subwords**.

4.3. Definition of a word

In this study, I follow the theory of Distributed Morphology (DM), the line of research advanced by Halle–Marantz (1993) and Embick–Noyer (2001; 2007) in which 'words' are composed by rules of syntax. I state below Embick and Noyer's definition of 'morphosyntactic word' and 'subword' (2001, 574):
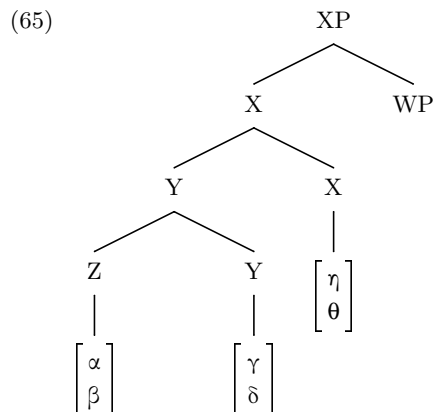
(63) **Morphosyntactic word**

At the input to Morphology, a node X^0 is (by definition) a morphosyntactic word (MWd) iff X^0 is the highest segment of an X^0 not contained in another X^0.

(64) **Subword**

A node X^0 is a subword (SWd) if X^0 is a terminal node and not an MWd.

Embick and Noyer (2001) provide the following diagram for illustration:

(65)

The MWd X in (65) contains Z, Y, and X. The Y that consists of Z and Y is not an MWd according to the definition provided in (63) because Y is dominated by X, which is a MWd. In (65), Z, the lower segment of Y, and the lower segment of X are all terminal nodes and not MWd. Therefore, they are all SWd's.
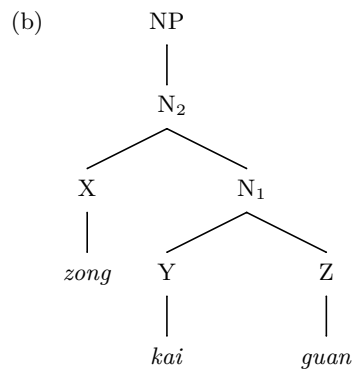
Take a Mandarin example for illustration. The structure in (67) represents the internal structure of the MWd [*ci wan*] in (66). As shown in (67), SWd's *ci* 'porcelain' and *wan* 'bowl' form an MWd, i.e., N_2.

(66) [[ci]   wan]
     porcelain bowl
   'porcelain bowl(s)'

(67)

```
            NP
            |
            N₂
           /  \
          X    N₁
          |    |
          ci   wan
```
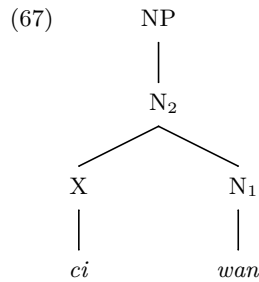
Note that I did not label the node where *ci* 'porcelain' is realized in (67) as Adj. In this study, I only label the noun node under the N head and consider all other subwords as morphemes that do not carry any syntactic categories. From now on, I change the notation of *de*-less modification, [A N], that I have been using in the previous sections to [X N] in order to be neutral about the syntactic status of X. When there are two subwords and the noun node, I notate it as [Y X N]. Take the following Mandarin example for further illustration:

(68) (a) [zong   kai   guan]
       general open close
      'general switch(es)/control(s)'

    (b)

```
              NP
              |
              N₂
             /  \
            X    N₁
            |   /  \
          zong Y    Z
               |    |
              kai   guan
```

As shown in (68b), I did not label *kai* 'open' and *guan* 'close' as verbs, the syntactic category that *kai* and *guan* usually have. Instead, I labeled them as Y and Z just to indicate that they are different morphemes. It

is when Y and Z combine together, the string, [Y Z], can be used as a name to refer to a kind of objects, switches. When *zong* 'main, general' combines with *kai* 'open' and *guan* 'close,' the new string is used as a name to refer to a more specific kind of switches, namely main/general switches. Without *zong* 'general' in (68b), N$_1$ would be a MWd. With *zong* 'general', only N$_2$ is a MWd; N$_1$ is not.

Recall that S&S (1987; 1991) also argue that [X N] forms a word (cf. sections **3.1–3.2**). They argue in their (1991) work that there is a θ-relationship between X and N. X, being an Adj, assigns a θ-role to the noun. It is not clear to me what kind of θ-role the Adj, being a sub-part of a word, assigns to the noun. It is also not apparent to me what S&S are trying to achieve by assuming there is a θ-relationship between X and N. Later in the text, I show that the adjectival status of X in [X N] is questionable.

Thus far, we have enough evidence to support the idea that the elements in a string like [Y X N], the so-called *de*-less modification, form a word, while [[Y *de*] [X *de*] NP] does not. The syntactic difference between [Y X N] and [[Y *de*] [X *de*] NP] may be, in part, responsible for the ordering restriction since the internal construction of a word often does not have as much freedom as the combination of phrasal elements. In section **4.4**, I argue that the unpredictability of ordering restrictions observed within subword formation is not only because of the lexical processes but also related to its semantic interpretation as a whole.

4.4. Concept vs. sub-concept relationship

As pointed out by Zhu (1980) and Duanmu (1998), the combination of [X N] in Mandarin is not fully productive and many gaps remain. I suggest that if we take into account where [X N] occurs in syntax, we might have a better understanding why the construction has such unpredictable ordering restrictions and is not fully productive like the *de*-modification system.

Yang (2005) suggests that nouns realized at the N head are concept-denoting nouns and that kinds are subsets of concepts. Following Yang (2005), I argue that adding any element to a concept-denoting noun will create a new or sub-concept term. To examine whether this proposal is on the right track, I use the example *ci wan* 'porcelain bowl(s)' as a test. I apply two common diagnostics, suggested in Krifka et al. (1995), to see whether *ci wan* 'porcelain bowl(s)' can function as a concept/kind-

referring noun. First, I place [*ci wan*] in the subject position of a predicate that favors a kind-referring interpretation, as in (69).

(69) [ci   wan] shi Zhongguoren faming de
     porcelain bowl be Chinese   invent de
     'Porcelain bowls were invented by the Chinese.'

[*ci wan*] in (69) does give us a kind-referring interpretation. Now compare [*ci wan*] in (69) to *lü wan* 'green bowl' in (70). The example in (70) sounds very odd.

(70)$^{???}$[lü   wan] shi Zhongguoren faming de
     green bowl be Chinese   invent de
     'Green bowls were invented by Chinese.'

The example in (70) is odd because *lü wan* 'green bowl' is not a term that speakers and listeners are conventionally familiar with. Hence, using the term as a sub-concept creates oddness. Now let's put *ci wan* 'porcelain bowl' and *lü wan* 'green bowl' in a sentence like (71). Again, the noun *ci wan* 'porcelain bowl' gives us a concept/kind-referring reading, but not *lü wan* 'green bowl.'

(71) (a)   [ci   wan] (tongchang) hen bao
       porcelain bowl usually   very thin
       'Porcelain bowls are (usually) very thin.'

    (b)$^{???}$[lü   wan] (tongchang) hen bao
       green bowl usually   very thin
       'Green bowls are (usually) very thin.'

A similar example is found in English. The example is from Carlson (1977), who attributes it to Barbara Partee; cited in Krifka et al. (1995, 11 (24)):

(72) (a) **The Coke bottle** has a narrow neck.

    (b)$^{??}$**The green bottle** has a narrow neck.

The reason that (72a) is natural, while (72b) is odd, is because the shape of the Coke bottle is well-established in speakers' and listener's conventional views, whereas the shape of green bottles is not. And that is exactly what we observed in the examples in (70)–(71). I argue that

the more intricate the concept-terms are, the more complex the common grounds must be among speakers and listeners.

I argue that $[_{NP}\ N_1]$ and $[_{NP}\ X\ N_2]$ form a superset–subset relationship if N_1 and N_2 are the same. Now let me explicitly present this idea in (73).

(73) (a) If $[_{NP}\ N_1]$ is a concept-referring noun, and

    (b) $[_{NP}\ X\ N_2]$ is a possible concept-referring term in the speakers' and listeners' conventional use, and

    (c) N_1 and N_2 are the same,

    (d) then $[_{NP}\ X\ N_2]$ is a sub-concept/sub-kind of $[_{NP}\ N_1]$.

I take the examples in (74) for illustration:

(74) (a) [wan]   (a′) $[_{NP}\ N_1]$
       bowl
    'bowl(s)'

    (b) [**ci**   wan]   (b′) $[_{NP}\ X\ N_2]$
      porcelain bowl
      'porcelain bowl(s)'

    (c) [**xiao ci**   wan]   (c′) $[_{NP}\ Y\ X\ N_3]$
      small porcelain bowl
      'small porcelain bowl(s)'

I have demonstrated in (69) and (71a) that *ci wan* 'porcelain bowl(s)' in (74b) is a possible concept-referring term. In (75)–(76), I show that the nominal phrase *xiao ci wan* 'small porcelain bowl' in (74c) is also a possible concept-referring term.

(75) [[xiao] [ci]   wan] hen changjian
      small porcelain bowl be common
    'Small porcelain bowls are very common.'

(76) [[xiao] [ci]   wan] (tongchang) hen bao
      small porcelain bowl usually   very thin
    'Small porcelain bowls are (usually) very thin.'

One way of demonstrating that $[_{NP}\ X\ N_2]$ is a sub-concept of $[_{NP}\ N_1]$ and $[_{NP}\ Y\ X\ N_3]$ is a sub-concept of $[_{NP}\ X\ N_2]$ is to show that these nouns form a superset–subset relationship. In other words, the relationship is downward monotonic. Consider the following examples.

(77) (a) Lisi mei you [wan]
        Lisi not have bowl
        'Lisi does not have a bowl'

            ⇓   ⇗̸

  (b) Lisi mei you [[ci]   wan]
        Lisi not have   porcelain bowl
        'Lisi does not have a porcelain bowl.'

            ⇓   ⇗̸

  (c) Lisi mei you [[xiao] [ci]   wan]
        Lisi not have   small porcelain bowl
        'Lisi does not have a small porcelain bowl'

The sentence in (77a) entails (77b), which entails (77c), but not the other way around. The generalization that we can draw from the examples here is as follows:

(78) If $N_1 = N_2 = N_3$, then $[_{NP} N_1] \supseteq [_{NP} X N_2] \supseteq [_{NP} Y X N_3]$

I think we are in a better position to make sense of why ordering restrictions only affect "*de*-less modification" (S&S 1987; 1991). First, when we examine the ordering of [X N], we are actually dealing with subword formation that usually does not have as much freedom as phrasal formation such as *de*-modification. Further, when a noun is realized at the N head, it is a concept-referring noun. Creating a sub-concept term requires common ground among speakers and listeners. When the kind/concept terms get finer, it becomes more difficult to maintain common ground among speakers and listeners. That might be the reason why there is so much variation and idiosyncratic ordering restrictions found in the so-called *de*-less modification structure.

    In section **4.5**, I show that the semantic interpretation of [X N] poses a series of challenge to compositional semantics.

4.5. *de*-less modification: Do *de*-less elements really have a modification function?

In the previous sections, I suggested that *ci* 'porcelain' in *ci wan* 'porcelain bowl(s)' and *zong* 'general, main' in *zong kai guan* 'general switch' should not be labeled as Adj's though they look like they function as

adjectival modifiers. In this section, I show that these Adj-like elements pose a number of challenges to semantic compositionality. Take the Adj *old* for illustration. The Adj *old* in English has two possible meanings. One is an intersective reading, and the other is a non-intersective reading, as shown in (79):

(79) Gina is an **old friend**.
        Reading 1 (intersective): Gina is a friend, and Gina is old (aged).
        Reading 2 (non-intersective): Gina is a long-time friend.

In the first reading, Gina is an aged friend, while in the second reading, we have no information to know whether Gina is old or young. With this case in (79) in mind, we can predict that the example in (80) behaves similarly to the one in (79), which is ambiguous.

(80) Gina ran into an **old classmate** yesterday.
        Reading 1 (intersective): Gina ran into a classmate, and that classmate is aged.
        Reading 2 (non-intersective): Gina ran into a classmate from the past.

In both (79) and (80), *old* is ambiguous and can be interpreted as aged (the intersective reading). Now consider the Mandarin counterpart of *old friend:*

(81) wo you   [san   ge [**lao pengyou**]]
        I   have three cl   old friend
        Only reading: 'I have three long-time friends.'   (cf. (79))

Unlike *old friend* in English, *lao pengyou* 'old friend(s)' in Mandarin is not ambiguous in its reading. It has only one reading—I have three long-time friends. It is natural to add information about these friends' ages since this information is missing in the term *lao pengyou* 'old friend(s),' as demonstrated in (82):

(82) wo de   zhe ge [lao pengyou] yijing   hen lao le
        I   de$_{Poss}$ this cl old friend   already very old asp
        'This long-time friend of mine is already very old.'

Note that it is not the case that *lao* in Mandarin can only mean 'long-time'. Recall the example in Krifka et al. (1995), *lao xiong* 'old bear(s)' can only mean aged bear(s). There are plenty of other examples involving *lao* 'old', but they are not ambiguous like those English examples. Here is one more example:

(83) wo zuotian   yudao   [san   ge [**lao tongxue**]]
     I   yesterday run into three cl old classmate
     Only reading: 'Yesterday I ran into three classmates from long time ago.' (cf. (80))

In (83), *lao tongxue* 'old classmate(s)' does not mean 'aged classmate(s)' or 'being classmates for a long time.' It only means 'classmates from long time ago.' They might be my classmates for a year only in my elementary school, but we have not been classmates for a long time. Even though the sentences in (79) and (80) are ambiguous, one of the readings in both examples is 'aged.' However, this reading is missing from their Mandarin counterparts in (81) and (83). The 'aged' reading appears when we combine *lao* 'old' with *xiansheng* 'Mr.' or 'gentleman.' *lao xiansheng* 'aged gentleman' can only mean 'aged male.' It does not mean 'gentleman from the past.'[22]

Despite the unpredictability of the meaning of [X N] in terms of compositionality, another challenge in computing the meaning of [X N] is to distinguish whether the X in [X N] is a real "modifier" or not. For example:

(84) (a)   duan ku
           short pant
           'shorts'

     (b)   da yi
           big clothes
           'coat(s)'

     (c)   hei   shou
           black hand
           'mechanic(s)'

---

[22] If the interpretation of the [X N] combination can be handled in the standard compositional way, when *lao* 'old' combines with *xiaojie* 'Miss/lady', we might predict the meaning of *lao xiaojie* would be 'aged woman/lady.' The prediction is not borne out. This term does not mean 'aged lady'; it is used as a derogatory term to refer to women who are not married after certain age. This kind of "mistake" is often made by students who learn Mandarin as their second language and were not warned by their teachers. When they try to follow a certain pattern they have learned such as the 'aged gentleman' case, they generalize the rule to *lao xiaojie* and expect to get the meaning 'aged woman' cross. They would soon find out that the term *lao xiaojie* is an embarrassment to both themselves and the addressee.

(85) (a)   chang shou
            long   life
            'long life'

      (b)   xiao   wan
            small bowl
            'small bowl(s)'

      (c)   hei   zhenzhu
            black pearl
            'black pearl(s)'

The examples in (84) involve Adj-like elements similar to those in (85),
namely short/long, big/small, and black. It looks like these examples
could be handled through a semantically compositional way. However,
that is not the case in (84). *duan ku* in (84a) does not refer to pants
that are short; it is a term used specifically for shorts. Furthermore, *da
yi* in (84b) does not mean clothes that are big but refers to long coats.
Finally, *hei shuo* is a term used for mechanics, not for black hands. These
meanings cannot be computed in a compositional way.

     The question arises as to whether X in [X N] really has any mod-
ification function at all. All the X's in (84) do not have modification
functions. I suggest that all the X's in [X N] in both (84)–(85) are there
to create sub-concept terms; they do not "modify" the N. For example, *ku*
in (84a) is a generic term for "an outer garment covering the body from
the waist to the knees/ankles with a separate part fitting over each leg".
When *duan* 'short' is added to *ku*, the term, *duan-ku*, refers to a more spe-
cific kind of outer garment covering the body from the waist to the knees
with a separate part fitting over each leg. When *chang* 'long' combines
with *ku*, another specific kind that usually covers as far as the ankles is
created. When *bai* 'white' and *chang* 'long' combine with *ku*, another
specific kind is created under *chang ku* 'long pants.' This time it refers
to a sub-kind of long pants that are white. Hence, I argue that the term
de-less modification is not adequate for the combination of [X N]. I sug-
gest that the term 'morphosyntactic word formation' (MWd-formation)
can better describe the nature of this construction.

     What I have shown in this section is that the meaning of [X N]
can be very unpredictable. Even though we have seen cases that are
compositional, the challenge is when one tries to compute the meaning
of [X N] in a systematic way. In order to decide whether the sub-parts
of a certain MWd can be computed compositionally, one has to first look

at what the MWd means as a whole. Then one can decide whether
composition can be applied or not. However, this is not the essence of
semantic compositionality.

After clarifying the nature of the [X N] structure, we are in a position
to answer the question about why there is an ordering restriction between
MWd-formation (the so-called *de*-less modification) and *de*-modification.
In the next section, I examine this ordering restriction.

### 4.6. Ordering restriction between MWd-formation and *de*-modification

Recall that when *de*-modification and MWd-formation co-occur, the or-
dering between these two strings is fixed. The only possibility is to have
de-modification preceding MWd-formation, as demonstrated in (86) (S&S
1991, 571 (15)):

(86) (a) [hei   de]   [xiao] shu
            black de$_{Mod}$ small book
           'small black book(s)'

      (b) *[xiao] [hei   de]   shu
            small   black de$_{Mod}$ book
           'small black book(s)'

I argue that this ordering restriction follows from the syntactic categories
of MWd-formation and *de*-modification. We have seen evidence that the
so-called *de*-less modification and the noun form an MWd and that *de*-
modification is phrasal. Hence, it is legitimate to assume that only SWd's,
not phrasal elements, can be part of the internal structure of an MWd.
That is to say that (87) is a well-formed structure, but (88) is not.

In (87), a modifier phrase (ModP) adjoins to nP, while in (88), a
modifier phrase intervenes between SWd's. Hence, (88) is not a well-
formed structure.

As mentioned in section **1**, Adj's can appear in pre-N and pre-D
positions (cf. (1)–(2)). However, this possibility is only allowed for *de*-
modification but not for MWd-formation, as shown by the grammatical
contrast shown in (89)–(90).

(87)

(ModP = Modifier Phrase)

(88)
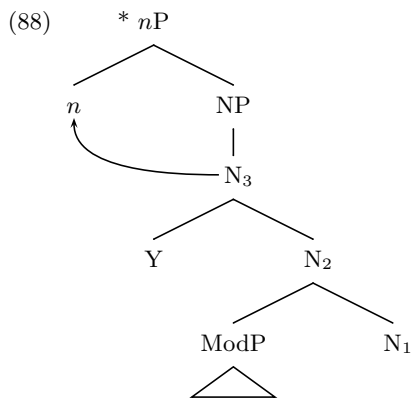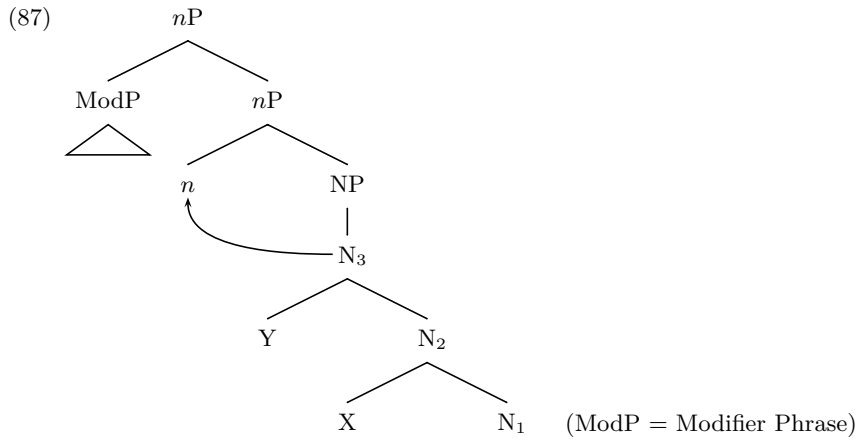
(89) **Pre-N modification**

(a) [$_{DP}$ na   yi   ben [xin **de**]   shu]
     that one cl   new de$_{Mod}$ book
   'that new book' (*de*-modification)

(b) [$_{DP}$ na   san   ben [xin] shu]
     that three cl   new book
   'that new book' (MWd-formation)

(90) **Pre-D modification**

(a) [xin **de**]   [$_{DP}$ na   yi   ben shu]
   new de$_{Mod}$ that one cl   book
   lit. 'new that book' (*de*-modification)

(b) *[xin] [$_{DP}$ na   san   ben shu]
    new   that three cl   book
    lit. 'new that book' (MWd-formation)

In (89), we see that both *de*-modification and MWd-formation can occur in the pre-N position, but only *de*-modification is allowed in the pre-D position, as shown in (90a). Based on the structure in (87), the asymmetry between (89a) and (90a) on the one hand and (89b) and (90b) on the other can be understood straightforwardly. [Adj *de*] is phrasal and comes into the structure through adjunction. Thus, it has freer mobility than a SWd. Until this point, I have presented my position that the examples in (89a) and (89b) involve distinct syntactic constructions. That is, (89b) is not a case of (89a) with a silent *de* marker.

The next question that I address concerns the internal structure of Adj *de*. More specifically, I investigate whether Adj and *de* form a MWd before they project or whether they occupy different positions. In the following section, I explore the structure of Adj *de* and argue that the morpheme *de* is a phrasal head and that AdjP occupies a specifier position.

4.7. Syntactic structure of Adj *de*

I propose that Adj *de* has the structure in (91). In this structure, *de* occupies a functional head, η, and AdjP, a phrasal element, appears in its specifier position.

(91)
```
              ηP
             /  \
          AdjP   η′
                /  \
              η⁰   nP/DP
              |
              de
```
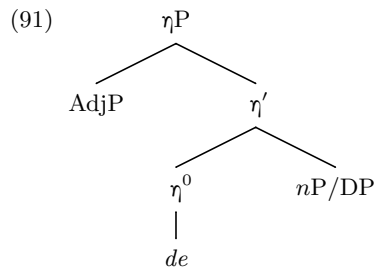
I suggest that the function of the η projection is to introduce a position for AdjP's to occur.[23] The referents of ηP are always a subset of the

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[23] I assume that relative clauses also occur in the [Spec, ηP] position. In this study, I focus on AdjP's and do not discuss the internal structure of RC's. For more

referents of nP/DP. For instance, the objects referred to by $[_{\eta\mathrm{P}}\;xin\;de$ $[_{n\mathrm{P}}\;shu]]$ 'new books' are a subset of those referred to by $[_{n\mathrm{P}}\;shu]$ 'books.' The evidence that I use to support the structure in (91) is based on the examples in (92)–(93).

(92) (a) [[you [bai] you [ke'ai]] **de**   [haibao]]
      both white and cute de$_{Mod}$ seal
   'both white and cute seal(s)'

   (b) [[you [ke'ai] you [bai]] **de**   [haibao]]
      both cute and white de$_{Mod}$ seal
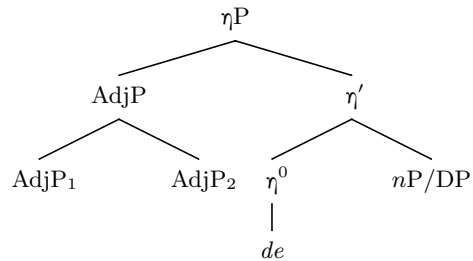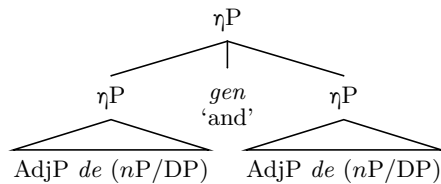   'both cute and white seal(s)'

The examples in (92a–b) can be interpreted as singular or plural. In the singular reading, there is a seal which is both white and cute. The following reading is not available: 'a cute seal and a white seal.' The possibility of having a singular reading in (92) indicates that both AdjP's are coordinated and modify the same noun. Furthermore, the AdjP's are coordinated without repeating the marker *de*. This combination shows that both *ke'ai* 'cute' and *bai* 'white' are phrasal. Since they are phrasal elements, they cannot occupy a head position. That is why in (91) AdjP is placed in the specifier position.

    Furthermore, unlike (92a–b), a singular reading is absent in (93). The examples in (93) can only be used to refer to multiple books. (93b) is only felicitous if there are two kinds of books: one is thick, and the other is small.

(93) (a) [hou de   shu] gen [xiao de   shu]
      thick de$_{Mod}$ book and small de$_{Mod}$ book
   'thick book(s) and small book(s)'

   (b) [[hou de   ___] gen [xiao de   ___]] shu
      thick de$_{Mod}$ and small de$_{Mod}$ book
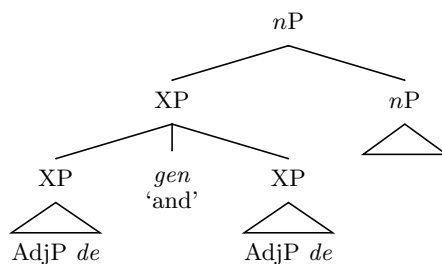   'thick book(s) and small book(s)'

(92b) differs from (93b) in the level of coordination. I argue that the former involves AdjP-coordination, as in (94), whereas the latter employs ηP-coordination, as demonstrated in (95).

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information about Mandarin RC constructions, see Del Gobbo (2003); Huang (1982), and Li–Thompson (1989).

(94) **AdjP-coordination**

```
              ηP
         ┌────┴────┐
       AdjP        η′
      ┌──┴──┐    ┌──┴──┐
   AdjP₁  AdjP₂  η⁰   nP/DP
                  │
                  de
```

(95) **ηP-coordination**[24]

```
                    ηP
          ┌─────────┼─────────┐
         ηP        gen        ηP
        ╱  ╲      'and'      ╱  ╲
   AdjP de (nP/DP)     AdjP de (nP/DP)
```

The absence of the singular reading in (93b) suggests that the structure in (96) is not a possible one.

(96)

```
                    nP
           ┌────────┴────────┐
          XP                 nP
     ┌─────┼─────┐          ╱ ╲
    XP    gen    XP        ▵
   ╱ ╲   'and'  ╱ ╲
  ▵            ▵
 AdjP de     AdjP de
```

The structure in (96), which always permits a singular reading, is a standard configuration for nominal modifiers and nouns. However, this is not what the fact in (93b) shows. Therefore, the structure in (96) is not adequate.

Furthermore, when Poss and η are both projected, the Poss head always dominates the η head, as illustrated in (97). When *Lisi de* 'Lisi's' precedes *piaoliang de* 'pretty', as in (97a), the sentence is grammatical.

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[24] Again, I leave the question open as to whether (93b)/(95), an instance of Right Node Raising, are the result of rightward Across the Board movement (see Ross 1967; Postal 1974; 1998; Sabbagh 2003 or leftward ellipsis (Wexler–Culicover 1980; Kayne 1994; Wilder 1997).

In contrast, if *piaoliang de* 'pretty' occurs before *Lisi de* 'Lisi's', the sentence is ungrammatical, as in (97b).[25]

(97) (a) [Lisi de   [piaoliang de   [paoche]]] ting zai shu xia
        Lisi de$_{Poss}$ pretty   de$_{Mod}$ sports car park at tree under
      'Lisi's pretty sports car(s) is/are parked under the tree.'

   (b) *[piaoliang de   [Lisi de   [paoche]]] ting zai shu xia
        pretty   de$_{Mod}$ Lisi de$_{Poss}$ sports car park at tree under
      'Lisi's pretty sports car(s) is/are parked under the tree.'

Having discussed the syntactic structure of *de*-modification I propose in (91), I would like to declare my view regarding the unsettled issue between S&S (1987; 1991) and Paul (2003)—whether *de*-modification is derived from relative clauses or not. I agree with Paul (2003) that the *de*-modification construction in Mandarin is not derived from relative clauses (RC). Detailed discussion is provided in the following section.

4.8. *de*-modification is not derived from relative clauses

S&S (1987) argue that if *de* modifiers are relative clauses, then the Adj's in them must be in the predicate position. These Adj's should, therefore, be able to occur in the predicate position. On the other hand, if an adjective cannot appear in the predicate position, then it should not be able to occur as a pre-Nominal *de* modifier, though it is possible to have this Adj function as *de*-less modification (in their term). The

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[25] The ordering restriction between possessor phrases and AdjP's applies even when they are not juxtaposed, as illustrated in (i). The AdjP in (i) appears in the pre-D position, whereas the possessor phrase occurs in the pre-N position. (i) is ungrammatical. In contrast, when the possessor phrase appears in the pre-D position and the AdjP in the pre-N position, the sentence is grammatical, as shown in (ii).

(i) *[[baise] de   na   san jian [Lisi] de   [maoxianyi]] bu jian le
     white de$_{Mod}$ that three cl   Lisi de$_{Poss}$ sweater   not meet asp
(ii) [[Lisi] de   na   san jian [baise] de   [maoxianyi]] bu jian le
     Lisi de$_{Poss}$ that three cl   white de$_{Mod}$ sweater   not meet asp
    lit. 'Lisi's those three white sweaters are missing.'

The reviewer suggests that there might be a unified account for Adj *de* and the *de* in possessive construction. However, both elements behave distinctively and should not be treated as the same element. For more information about the possessive *de* see chapter 5 in Yang (2005).

examples they use to support their claim are *former* in English and *qian* 'former' in Mandarin. They show that neither *former* in English nor *qian* 'former' in Mandarin can appear in the predicate position. See (28)–(30) in section **3.1**; for Paul's (2003) counterargument, see (37) in section **3.3.**

Further, S&S (1991) relate Adj's to intransitive verbs and claim that they have parallel structures, as in (98)–(99) (*op.cit.*, 572 (16)–(17)).

(98) (a) tianqi **hao**
         weather good
         'The weather is good.'

   (b) bi **gui**
         pen expensive
         'Pens are expensive.'

   (c) konglong **da**
         dinosaur big
         'Dinosaurs are big.'

(99) (a) niao **fei**
         bird fly
         'Birds fly.'

   (b) na   zhi gou **jiao**
         that cl   dog bark
         'That dog is barking.'

   (c) chezi **lai**
         car   come
         'The car is coming.'

The examples in (98) and those in (99) do look alike. However, it is misleading to claim that the structure of the examples in (98) is parallel to that of the examples in (99). The reasons are as follows: first, the examples in (98) sound incomplete when they are used alone. When bare AdjP's, i.e., without *de,* occur after nouns, they often function as the comments in what is called "topic–comment" construction in descriptive grammar, as in (100):

(100)   zai zhe jia dian li, [bi **gui**],   [shu **pianyi**]
         at this cl store in pen expensive book cheap
         'In this store, as for pens, they are expensive, and as for books, they are cheap.'

In (100), 'in this store' is the topic, and the following two parts, *bi gui*

and *shu pianyi*, are both comments to the topic. Bare AdjP's are allowed within the construction of the comments. It is also possible to have a bare AdjP in contrasting sentences in which the speaker wants to contrast two items, the topics, clothes and friends in this case. What follow the topics are comments in which bare AdjP's are found.

(101)   yifu,   [xin de **hao**], pengyou [jiu de **hao**]
        clothes new de good friend   old de good
        'Clothes, new ones are good; friends, old ones are good.'
        (Li–Thompson 1989, 101 (55))

Recall the information in footnote 10. When scalar adjectives and some absolute adjectives are used as a sole predicate, the presence of *hen* 'very' is obligatory. Li and Thompson (1989) note that when this adverbial modifier is not heavily stressed, its adverbial meaning is bleached. In other words, *hen* 'very' can be semantically empty. Hence, the sentence in (102) is ambiguous between two meanings.

(102)   na   ge guojia   [*(hen) minzhu]
        that cl country   very democratic
        Reading 1: That country is very democratic.
        Reading 2: That country is democratic.
        (Li–Thompson 1989, 143 (168b))

Even though it is puzzling why *hen* 'very' is obligatory when it does not contribute any semantic interpretation, in order to make those examples in (98) sound complete, *hen* must appear between the nouns and the Adj's.

Similar to the examples in (98), the examples in (99) do not sound complete, either, though for a different reason. Some grammatical elements are required to make these examples sound complete. I put the sentences that sound complete to me to the right of S&S's data.

(103)   **S&S's data**

        (a)   niao fei   (a′) niao **zai**/ **hui** fei
              bird fly   bird dur can fly
              'Birds fly.'   'Birds are flying.' or 'Birds can fly.'

        (b)   na   zhi gou jiao   (b′) na   zhi gou **zai** jiao
              that cl   dog bark   that cl   dog dur bark
              'That dog is barking.'   'That dog is barking.'

(c) chezi lai
    car   come
    'The car is coming.'

(c′) chezi lai   **le**
    car   come crs
    'The car is coming.'

(dur = durative aspect; crs = currently relevant state; Li–Thompson 1989)

I stated that S&S's examples sound incomplete because they can be grammatical chunks in special constructions. For instance, when (98b) occurs in a construction like (100), it is acceptable. However, when it stands by itself, it is not. Let me provide another example based on (103b).
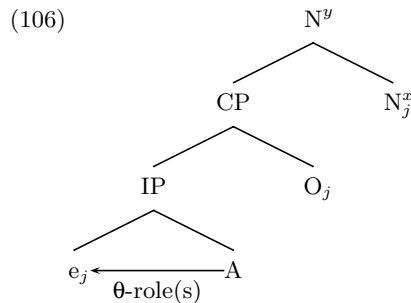
(104)   na   zhi gou **jiao**, zhe zhi gou ye   **jiao**, zhen   shi taoyan
       that cl   dog bark this cl   dog too bark really be   annoying
       'That dog barks, and this dog also barks. It's really annoying.'

Now I put the "complete" version of the examples in (98–99) side by side in (105).

(105)(a) tianqi **hen** hao
       weather very good
       'The weather is good.'

(d) niao **zai**/ **hui** fei
    bird dur/ can fly
    'Birds are flying.' or 'Birds can fly.'

(b) bi **hen** gui
    pen very expensive
    'Pens are expensive.'

(e) na   zhi gou **zai** jiao
    that cl   dog dur bark
    'That dog is barking.'

(c) konglong **hen** da
    dinosaur very big
    'Dinosaurs are big.'

(f) chezi lai   **le**
    car   come CRS
    'The car is coming.'

The pattern on the left side does not look like the one on the right anymore. S&S's argument that Adj's behave like intransitive verbs is solely based on their surface structures. However, I have shown that there is no obvious surface parallelism between Adj's and intransitive verbs, invalidating S&S's argument.

Another problem with S&S's proposal is their syntactic structure of *de*-modification. I repeat their structure in (106). Recall that S&S argue that *de*-modification is derived from relative clauses in which there is an operator in a non-argument position, COMP. This operator is co-indexed with the head of the nominal and binds a variable in an argument position.

(106)

```
                        N^y
                       /    \
                      CP     N_j^x
                     /  \
                    IP   O_j
                   /  \
                 e_j ←——— A
                   θ-role(s)
```

They suggest that the example in (107a) would have the structure of (107b) schematically:

(107)(a) [da **de**]   konglong
          big de$_{Mod}$ dinosaur
        'big dinosaur(s)'
        (S&S 1991, 573 (18c))

   (b) [[[[e]$_j$ da] O$_j$] konglong$_j$]
            big Op dinosaur
        (*op.cit.*, 573 (20))

It is not clear to me where S&S would place the marker *de* in the structure in (106) or (107b). Notice that when AdjP's occur in the predicate position, they do not have the marker *de*, as shown in (105a, b, and c). S&S assume that the AdjP's in the relative clauses are exactly the same as the ones appearing in the predicate position. Therefore, the AdjP in the structure in (106) does not have the marker *de* like the examples in (105). However, *de* is present in (107a). If *da de* 'big' in (107a) is derived from (106) or (107b), we would expect *de* to be absent as the structures show. This expectation is not borne out.

Furthermore, despite the fact that AdjP's and RC's function as pre-Nominal modifiers, there is a difference between these two kinds of modifiers in terms of their syntactic distribution. AdjP's cannot immediately precede a numeral, as in (108), while RC's can, as in (109).[26]

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[26] Shimoyama (2005) observes that the "sizes" of noun modifiers contribute various scope island effects for degree quantifiers. She shows that Japanese adjectival modifiers do not show the scope island effect for degree quantifiers, whereas finite relative clauses do.

(108)(a) san   ge [congming] de   xuesheng   (✓pre-N)
       three cl   intelligent de$_{Mod}$ student
       'three intelligent students'

   (b) *[congming] de   san   ge xuesheng   (*pre-D)
       intelligent de$_{Mod}$ three cl student

(109)(a) san   ge [$_{RC}$ wo jiao   guo] de   xuesheng   (✓pre-N)
       three cl   I   teach past de$_{Mod}$ student
       'three students who I taught before'

   (b) [$_{RC}$ wo jiao   guo] de   san   ge xuesheng   (✓pre-D)
       I   teach past de$_{Mod}$ three cl student
       'three students who I taught before'

Even though why (108) is ungrammatical is puzzling and requires further research, its ungrammaticality indicates that AdjP's have a distinct property from RC's. They contribute various syntactic effects and should not be treated equally.

In this section, in addition to referring back to Paul's argument, I showed that S&S's claim that *de*-modification is derived from relative clauses is not well-grounded. Thus far, I hope the syntactic status of [X N] and [X *de* NP] is apparent. Before I conclude this paper, with all the information we have about [X N] and [X *de* NP], I evaluate Paul's suggestion that X and N in [X N] are phrasal in the following section.

4.9. Paul's (2003) argument on the phrasal status of X and N in [X N]

Paul (2003) argues, against S&S (1989; 1991) and Duanmu (1998), that X and N in [X N] are phrasal because they are accessible to deletion. The following are her examples (*op.cit.*, 8 (19)–(20)) with a slight modification of the gloss and additional bracketing from my part:

(110)(a) Amei bu xihuan [$_{DP_1}$ **huang meigui**], [$_{DP_2}$ **hong de**   ∅] hai keyi
       Amei neg like   yellow rose   red   de$_{Mod}$ still OK
       'Amei doesn't like yellow roses, red ones are still ok.'

   (b) Bu mai [$_{DP_1}$ **da   pangxie**], mai [$_{DP_1}$ **xiao de** ∅]
       neg buy   big crab   buy   small de$_{Mod}$
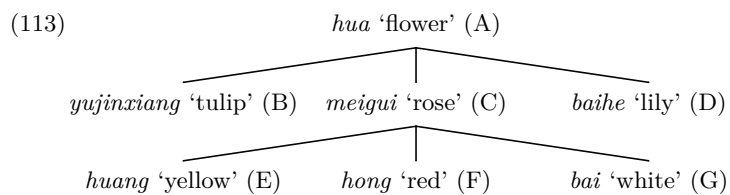   'Don't buy a big crab, buy a small one.' (neg = negation marker)

Notice that when we reverse DP$_1$ and DP$_2$ in both examples and delete the noun in DP$_1$, both sentences become ungrammatical.

(111)(a) *Amei bu xihuan [$_{DP_2}$ **hong de** **meigui**], [$_{DP_1}$ **huang** Ø] hai keyi
       Amei neg like   red de$_{Mod}$ rose   yellow   still OK

    (b) *Bu mai [$_{DP_1}$ **xiao de** **pangxie**], mai [$_{DP_1}$ **da** Ø]
       neg buy   small de$_{Mod}$ crab   buy big

If the noun in [X N] were phrasal, (111a, b) should be grammatical like the ones in (110). However, the expectation is not borne out. What (111) shows is that the noun in DP$_1$, unlike the NP in [X *de* NP], is not phrasal. It cannot undergo deletion, forcing some subwords (*huang* 'yellow' in (111a) and *da* 'big' in (111b)) to remain. Furthermore, even when we spell out the noun in DP$_1$, the noun in DP$_2$ cannot be deleted, either, as shown in (112).

(112)(a) *Amei bu xihuan [$_{DP_2}$ **hong de** Ø], [$_{DP_1}$ **huang meigui**] hai keyi
       Amei neg like   red de$_{Mod}$ yellow rose   still OK

    (b) *Bu mai [$_{DP_1}$ **xiao de** Ø], mai [$_{DP_1}$ **da pangxie**]
       neg buy   small de$_{Mod}$ buy   big crab

The question arises as to how we can account for the grammaticality of (110a, b) and the ungrammaticality of (112a, b). One possible approach to this question is to assume that there is an implicit discourse cue that licenses the deletion of the noun in (110), and this implicit cue is not present to license the deletion in (112). The puzzle is what the cue is. Before I begin a detailed discussion, consider the following hierarchy of flower kinds:

(113)   *hua* 'flower' (A)

yujinxiang 'tulip' (B)   *meigui* 'rose' (C)   *baihe* 'lily' (D)

huang 'yellow' (E)   *hong* 'red' (F)   *bai* 'white' (G)

In (113), *hua* 'flower' is a cover term for B, C, D, E, F, and G. According to the chart, tulips, roses, and lilies are different kinds of flowers, and yellow roses, red roses, and white roses are sub-kinds of roses (of course, there are also other kinds of flowers). There are two possible ways of referring to the kind E on the chart in Mandarin, namely *huang meigui*

'yellow roses' or *huang de meigeui* 'yellow roses' in this case.[27] Hence, in addition to (110a), there are two other ways of expressing the same meaning, as in (114b, c).

(114)(a) Amei bu xihuan [$_{DP_1}$ **huang meigui**], [$_{DP_2}$ **hong de** $\emptyset$] hai keyi
       Amei neg like   yellow rose   red de$_{Mod}$ still OK
       'Amei doesn't like yellow roses, red ones are still ok.'

    (b) Amei bu xihuan [$_{DP_1}$ **huang meigui**], [$_{DP_2}$ **hong *(meigui)**] hai keyi
       Amei neg like   yellow rose   red rose   still OK
       'Amei doesn't like yellow roses, red ones are still ok.'

    (c) Amei bu xihuan [$_{DP_1}$ **huang meigui**], [$_{DP_2}$ **hong de**   **megui**] hai keyi
       Amei neg like   yellow rose   red de$_{Mod}$ rose   still OK
       'Amei doesn't like yellow roses, red ones are still ok.'

Note that in (114b), if *meigui* is deleted or not pronounced, the sentence is ungrammatical. This is expected according to our analysis because *meigui* in (114b) is a SWd. The example in (114c) has all the elements spelled out and is grammatical.

    Let us return to the question raised earlier: what licenses the deletion of *meigui* in (114a)? I suggest that it is C in the chart, which is identified by DP$_1$ in (114a). After *huang meigui* 'yellow roses' in (114a) is introduced into the discourse, listeners are expecting a comparison of sub-kinds of roses based on different colors. When another sub-kind of roses enters into the discourse, such as 'red roses,' the part of information 'roses' is old and can be deleted under appropriate circumstances, such as legitimate syntactic configuration. As mentioned above, *meigui* in (114b) cannot be deleted due to the SWd status of *meigui*. If the speaker chooses to use the [X *de* NP] construction, then s/he has the choice of pronouncing the NP, as in (114c) or the choice of not pronouncing the NP, as in (114a).

    What about the ungrammaticality of (112), repeated here as (115)?

(115)(a) *Amei bu xihuan [$_{DP_2}$ **hong de** $\emptyset$], [$_{DP_1}$ **huang meigui**] hai keyi
       Amei neg like   red de$_{Mod}$ yellow rose   still OK

   (b) *Bu mai [$_{DP_1}$ **xiao de** $\emptyset$], mai [$_{DP_1}$ **da pangxie**]
       neg buy   small de$_{Mod}$ buy   big crab

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[27] I am not assuming that [X N] and [X *de* NP] can always be interchangeable. Under certain circumstances, like the one in (113), it is possible to use both [X N] and [X *de* NP] for 'yellow roses' or 'red roses.'

As shown in (115), DP_1 appears after DP_2. The noun in DP_2 cannot be deleted because there is nothing in the discourse that can license the deletion. Another example that Paul uses to support her claim that N in [X N] is phrasal is the following:

(116) *Amei bu   xihuan chi [$_{DP_1}$ **hong-hua**], [$_{DP_2}$ **huang de**   ∅] hai keyi
         Amei neg like   eat   red-flower   yellow de$_{Mod}$ still OK
         'Amei doesn't want to take safflower, yellow ones are still ok.'

The sentence in (116) is in fact grammatical under the reading that *hong hua* refers to red flowers.[28] However, this is not the reading that Paul is interested in. The reading of her interest is when *honghua* is used to refer to a kind of Chinese medicine/herb; that is why she uses 'eat' before *honghua*. (116) is ruled out for several reasons. Here I will only point out one. If *honghua* has sub-kinds such as *huang-de honghua* 'yellow safflowers' and *zi-de honghua* 'purple safflowers', then (116) is out because *honghua* is the superset of 'yellow safflowers' and 'purple safflowers'. After denying the superset, 'safflowers,' one also denies all its subsets.

In this section, I have shown that both X and N in [X N] are better analyzed as SWd's. There is no evidence that they are phrasal.

5. Conclusion

In this paper, I adopted a number of tests to examine whether *de*-less and *de*-modification are phrasal. I showed that the so-called "*de*-less modification" is in fact a kind of MWd-formation. The adjective-like *de*-less elements are SWd's. Hence, they cannot move out of their MWd domain and appear in the pre-D position. In contrast, adjectives with the *de* marker are phrasal and have freer syntactic distribution. In addition, I have presented empirical data to illustrate the fact that the ordering restrictions observed in the MWd-formation are related to the syntactic position where MWd's occur. In the case of [X N], it is realized in the N head position, where concept-denoting nouns are generated. Creating a new sub-concept term requires common ground among speakers and listeners. Hence, it is subject to complicated ordering restriction. Moreover, I argued that the marker following AdjP's, *de*, is realized in a functional head and that AdjP occupies a specifier position.

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[28] Of course, it is grammatical under the assumption that Amei likes to eat all kinds of flowers.

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