Abstract

The particle *de* 的 occurs with higher frequency than any other particle in Mandarin Chinese. Its main function in Chinese noun phrases is to link attributive words or phrases to the head noun. Classification of the different uses of the particle *de* has been of interest to linguists and computational linguists alike, not least because of its importance for machine translation from Chinese to English. The primary aim of this thesis is to describe and, where necessary, systemize existing classifications of the noun phrase internal occurrences of *de*. To this end, we have built a small-annotated corpus of *de* constructions using the TypeCraft Interlinear Glossed Text (IGT) Repository. In addition, we have made use of the TypeCraft Mandarin corpus as the data source for our linguistic classification of *de* constructions. This thesis distinguishes the uses of *de* in modification and relativisation structures, and explores sequences of *de*-attributes.
Acknowledgements

I would like to show my sincerest gratitude to my supervisor Professor Dorothee Beermann. Thank you for your patient and kindly guidance. Your helpful comments and advice meant a lot to me.

I would also like to thank the former Department of Language and Literature for giving me the chance to take a master’s degree at NTNU. I am grateful to the professors, lecturers and the staff at the former ISL. Thank you for the help I have received over these past two years. I will never forget my time at NTNU.

My thanks also go to all members of my beloved family, especially to my parents and my husband. Thank you for your loving consideration and support throughout these years. Thanks to my friends, for their encouragement, when I had to confront difficulties. I also owe my sincere gratitude to all my friends in China and Norway. I feel so lucky to have met all of you. You have made these past two years highly productive and joyful.
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# Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADJ</td>
<td>adjective</td>
</tr>
<tr>
<td>ADV</td>
<td>adverb</td>
</tr>
<tr>
<td>ADVm</td>
<td>manner adverb</td>
</tr>
<tr>
<td>AP</td>
<td>adposition</td>
</tr>
<tr>
<td>AS</td>
<td>aspect particle</td>
</tr>
<tr>
<td>AUX</td>
<td>auxiliary</td>
</tr>
<tr>
<td>CLF</td>
<td>classifier</td>
</tr>
<tr>
<td>CLFnum</td>
<td>numeral classifier</td>
</tr>
<tr>
<td>CN</td>
<td>common noun</td>
</tr>
<tr>
<td>CONJ</td>
<td>conjunction</td>
</tr>
<tr>
<td>COP</td>
<td>copula</td>
</tr>
<tr>
<td>DEC</td>
<td>de as a complementizer or an associative marker</td>
</tr>
<tr>
<td>DEG</td>
<td>de as a genitive marker or an associative marker</td>
</tr>
<tr>
<td>DET</td>
<td>determiner</td>
</tr>
<tr>
<td>IPHON</td>
<td>ideophone, onomatopoeia</td>
</tr>
<tr>
<td>MOD</td>
<td>modifier</td>
</tr>
<tr>
<td>N1</td>
<td>first common noun in a chain</td>
</tr>
<tr>
<td>N2</td>
<td>second common noun in a chain</td>
</tr>
<tr>
<td>Np</td>
<td>proper noun</td>
</tr>
<tr>
<td>Nploc</td>
<td>name of a location</td>
</tr>
<tr>
<td>Npname</td>
<td>personal name</td>
</tr>
<tr>
<td>NUM</td>
<td>numeral</td>
</tr>
<tr>
<td>PN</td>
<td>pronoun</td>
</tr>
<tr>
<td>PP</td>
<td>preposition and postposition</td>
</tr>
<tr>
<td>PPOST</td>
<td>postposition</td>
</tr>
<tr>
<td>PREP</td>
<td>preposition</td>
</tr>
<tr>
<td>PRT</td>
<td>particle</td>
</tr>
<tr>
<td>PUN</td>
<td>punctuation</td>
</tr>
<tr>
<td>QUANT</td>
<td>quantifier</td>
</tr>
<tr>
<td>REL</td>
<td>relative clause marker</td>
</tr>
<tr>
<td>SP</td>
<td>sentence-final particle</td>
</tr>
<tr>
<td>V</td>
<td>verb</td>
</tr>
<tr>
<td>V1</td>
<td>first verb in a chain</td>
</tr>
<tr>
<td>V2</td>
<td>second verb in a chain</td>
</tr>
<tr>
<td>V3</td>
<td>third verb in a chain</td>
</tr>
<tr>
<td>V4</td>
<td>fourth verb in a chain</td>
</tr>
</tbody>
</table>
Chapter 1. Introduction

1.1 Topic and goal

In Mandarin Chinese, the particle *de* that most people learn is 的. In fact, the particle *de* corresponds to three characters: 的, 地, 得. In this thesis, we will only discuss 的, which we will refer to as *de*. This particle *de* occurs with higher frequency than any other particle in Mandarin Chinese (Huang, 2007). *De* fulfills different grammatical functions: the marker of nominal modification, relative clause marker, and sentence final marker. This thesis will focus solely on occurrences of *de* in Chinese noun phrases. *De* is ubiquitous in Chinese noun phrases. Its main function is to link attributive words or phrases to the head noun. The attributive words may be nouns, adjectives, pronouns, onomatopoeia, while the attributive phrases may be adpositional attributes or relative clauses.

Chinese is a head-final language, which for example leads to a pattern of modification like *prepositional phrase + de + noun*, while in a head-first language like English, the order of the noun and its modifier is *noun + prepositional phrase*. Chang et al. (2009) propose that this structural difference is one important reason why machine translation from Chinese to English is difficult. To illustrate the point, we can briefly look at relative clauses. While English relative clauses, except for reduced relative clauses, are introduced by a relative pronoun, Chinese does not use relative pronouns (Huang, 1982). It uses *de* as the relative marker:

(1) 教我数学的老师1

“the teacher who taught me math”

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>教我</td>
<td>我</td>
<td>数学</td>
<td>的</td>
<td>老师</td>
</tr>
<tr>
<td>jiào</td>
<td>wǒ</td>
<td>shùxué</td>
<td>de</td>
<td>láoshī</td>
</tr>
<tr>
<td>teach</td>
<td>I</td>
<td>math</td>
<td>de</td>
<td>teacher</td>
</tr>
<tr>
<td>V</td>
<td>PN</td>
<td>N</td>
<td>PRT</td>
<td>N</td>
</tr>
</tbody>
</table>

Generated in TypeCraft.

1 http://typecraft.org/tc2/ntceditor.html#2884,58551
In example (1), the grammatical function of *de* is that of a relativizer which relates the relative clause to its head. When translating (1) into English with Google translation, we get: *I taught mathematics*, which of course is a different phrase in Chinese:

(2) 我教数学。\(^2\)

“I teach mathematics.”

wǒ
tiān
jīàoshùxué

I
teach
mathematics

PN
V
N

Generated in TypeCraft.

Example (1) is the original Chinese example, while example (2) is the Chinese equivalent of the incorrect Google translation of example (1). The original Mandarin sentence was a subordinate clause, while its incorrect translation is a simple sentence, just like its English counterpart. The word *de* has been ignored and the word *teacher* has become a verb and is translated as *teach*. The object *me* is translated as a subject to become *I* in example (2). A translation that ignores the function of *de* necessarily misunderstands the relation between the head of the relative clause *teacher* and its modifier, so that the necessary linear reordering of the head noun and its modifier cannot take place. Reordering and reordering problems when translating from Mandarin to English are of particular importance to machine translation (Feng et al., 2003). Chang et al. (2009) notice that reordering of phrases with the particle *de* occurs in relative clauses and prepositional phrases. Also, when the attributive phrase is a prepositional phrase, the function of *de* is to relate the prepositional phrase to the nominal head:

(3) 在沙发上的猫\(^3\)

“the cat on the sofa”

zài
shāfā
shàng
de
māo

at
sofa
surface.LOC
de
cat

PREP
N
PPOST
PRT
N

Generated in TypeCraft.

\(^2\) http://typecraft.org/tc2/ntceditor.html#2884,420170

\(^3\) http://typecraft.org/tc2/ntceditor.html#2884,58552
In example (3), the syntactic structure is *prepositional phrase + de + noun*, where the prepositional phrase *zàishāfāshàng* (*on the sofa*) modifies the noun *māo* (*cat*). In this case the Google translation of (3) is correct: namely, *cat on the sofa*. It seems that reordering is a problem in some cases, but not all. The particle *de* exists not only in the relative clause structures and prepositional phrase structures, but also with genitive phrases and adjectival phrases (Shi and Li, 2002).

(4) 西蒙的猫看见了一只苍蝇。
"Simon's cat saw a fly."

```
xīmĕng de māo kàn jiàn le yī zhī
simon GEN cat see meet one
```

In example (4), *de* is the genitive marker. Chinese does not have possessive pronouns. It uses *de*:

(5) 我的朋友
"my friend"

```
wǒ de péngyǒu
I GEN friend
```

(6) 这是一条干净的裙子
"This is a clean dress"

```
zhèi shì yī tiá o Gānjì ng de qúnzi
DEM be(is) one clean dress
```

---

4 http://typecraft.org/tc2/ntceditor.html#2884,58531
5 http://typecraft.org/tc2/ntceditor.html#2884,448273
6 http://typecraft.org/tc2/ntceditor.html#2884,58527
In example (6), *de* relates an adjectival phrase to the noun. Notice that in this case *de* is not obligatory and the meaning of the phrase will not change if we delete *de*. Nevertheless, the particle *de* is widely used in this configuration. These few examples already make clear that is not just the linear order of elements in the noun phrase that makes Mandarin different from the Indo-European languages, but also the extensive use of *de*. This thesis will try to contribute to our understanding of the particle *de* by presenting a systematic overview of functions as part of the nominal phrase.

### 1.2 Methodology

The present thesis is data-driven and descriptive. It makes use of the online linguistic service TypeCraft\(^7\) (Beermann & Michaylov, 2014). TypeCraft is a user-driven natural language database. At the time of writing, TypeCraft hosts 2137 texts from 146 languages. An overview of the size of the database is given in Table 1, which is taken from Beermann et al. (2016).

<table>
<thead>
<tr>
<th>Data type</th>
<th>Data count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text count</td>
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</tr>
<tr>
<td>Phrase count</td>
<td>316,604</td>
</tr>
<tr>
<td>Word count</td>
<td>5,297,405</td>
</tr>
<tr>
<td>Morpheme count</td>
<td>4,527,478</td>
</tr>
<tr>
<td>Part-of-speech tagged words</td>
<td>4,851,807</td>
</tr>
<tr>
<td>Gloss-tagged morphemes</td>
<td>330,714</td>
</tr>
<tr>
<td>Sense-tagged morphemes</td>
<td>1,173</td>
</tr>
</tbody>
</table>

TypeCraft provides a valuable service for contrastive studies. By means of giving *de* constructions an in-depth linguistic annotation, we have attempted to archive a systematic overview of existing linguistic categorization of this construction. While nominal phrases with a single occurrence of *de* already existed in TypeCraft, we had to add constructions with sequential attributives with *de*. The data that I will present in the corresponding

---

\(^7\) [http://typecraft.org/tc2wiki/Main_Page](http://typecraft.org/tc2wiki/Main_Page)
chapter in this thesis is taken from dialogues, newspapers, books, articles and social media. I will test the different orders of the sequential attributives in this section. I have imported the examples to TypeCraft\(^8\) and provided the necessary annotations using TypeCraft’s Gloss\(^9\) and POS\(^{10}\) annotation sets.

1.3 Outline

In Chapter 1, we present the structure of the thesis, introducing some background and the objective of this study as well as its methodology. Chapter 2 is the literature review from both the NPL side and the linguistic side of the problem that we address. Wang et al. (2007), for example, describe *de* constructions in which the focus is syntactic patterns of noun phrases from the Penn Chinese Treebank 3.0. We will look at this and similar approaches. Shi and Li (2002) present a linguistic classification of *de* constructions, which we will also discuss in the second part of Chapter 2. Besides, we will compare NLP and linguistic literatures. In Chapter 3, we present a detailed linguistic classification of the Chinese *de* constructions on the basis of our own data, and data that we found in TypeCraft. Chapter 4 explores the order of sequential attributives with respect to the use of the particle *de*. Chapter 5 contains the conclusions.

\(^8\) [http://typecraft.org/tc2wiki/Main_Page](http://typecraft.org/tc2wiki/Main_Page)
\(^9\) [http://typecraft.org/tc2wiki/Special:TypeCraft/GlossTags/](http://typecraft.org/tc2wiki/Special:TypeCraft/GlossTags/)
\(^{10}\) [http://typecraft.org/tc2wiki/Special:TypeCraft/POSTags/](http://typecraft.org/tc2wiki/Special:TypeCraft/POSTags/)
Chapter 2. Literature Review

2.1 The NLP Literature

According to the part-of-speech tagging guidelines for the Penn Chinese Treebank 3.0 (Xia, 2000), the character de can be tagged as DEC (de in a relative-clause), DEG (associative de), AS (aspect particle) and SP (sentence-final particle). De in relative clauses (tagged DEC) serves to combine the relative head with the relative clause, as illustrated in (7):

(7) 我们吃的食物\footnote{http://typecraft.org/tc2/ntceditor.html#2884,448274}
“food that we ate”

\begin{tabular}{llll}
wǒmén & chī & de & shìwù \\
we & eat & de & food \\
PN & V & PRT & N \\
\end{tabular}

Generated in TypeCraft.

When tagged as DEG, de function is a genitive or an associative marker, for example in (8):

(8) 西蒙的猫\footnote{http://typecraft.org/tc2/ntceditor.html#2884,448275}
“Simon’s cat”

\begin{tabular}{llll}
xīméng & de & māo \\
Simon & de & cat \\
N & PRT & N \\
\end{tabular}

Generated in TypeCraft.

Obviously, the Chinese N\textsubscript{1} DEG N\textsubscript{2} in example (8) is similar to the English possessive structure of N\textsubscript{1} ’s N\textsubscript{2}. The Chinese structure N\textsubscript{1} DEG N\textsubscript{2} can express not only possessive relations as shown in (8), but also associate relations as shown in (9):

(9) 环境的改善\footnote{http://typecraft.org/tc2/ntceditor.html#2884,448276}
“the improvement of the environment”
Still another semantic relation between postpositional phrase and noun related by *de* is shown (10):

(10) 房间的灯

"light in the room"

fángjiān  lǐ  de  dēng
room   in   light
N  PPOST  PRT  N

In (10), the postpositional phrase introduces a location that in English corresponds to a locative PP, while in Mandarin the *de* construction is maintained. Also, in possessive noun phrases, Chinese uses *de* to relate a personal pronoun to the head noun, instead of using a possessive pronoun form like English and other Indo-European languages. This is illustrated in (11):

(11) 我的母亲

"my mother"

wǒ  de  mǔqīn
I  light  mother
PN  PRT  N

*De* can also be inserted between the adjective and the head noun, as shown in (12):

(12) 红的花

"red flower"

hóng  de  huā
red  light  flower
ADJ  PRT  N

14 http://typecraft.org/tc2/ntceditor.html#2884,448277
15 http://typecraft.org/tc2/ntceditor.html#2884,448288
16 http://typecraft.org/tc2/ntceditor.html#2884,448289
Chang, Jurafsky and Manning (2009) claim that the presence of *de* is a major source for Chinese-English translation errors. According to them, *de* in noun phrases can be categorized into five classes considering syntactic and semantic parameters based on how they get translated into English:

Class 1: A B,
Class 2: A’s B,
Class 3: A preposition B,
Class 4: B preposition A,
Class 5: relative clause

I will now present these five classes in turn.

*Class 1*

In the A B class, A is considered as a pre-modifier of B. In most case A is an adjective or possessive adjective form, this category also includes compound nouns in which case A would be a noun. This then leads to three different word category patterns:

a: ADJ N,
b: PN N,
c: N₁ N₂

In terms of phrase structure rules, we arrive at the following three rules:

NP → ADJ DEG N
NP → PN DEG N
NP → N₁ DEG N₂

An example of NP → N₁ DEG N₂ pattern comes from Chang, Jurafsky and Manning (2009), see (13):

(13) 贸易的互补性¹⁷

"trade complement"

màoyì de hùbǔxing
trade complement
N PRT N

Generated in TypeCraft.

¹⁷ http://typecraft.org/tc2/ntceditor.html#2884,448346
Class 2
This A’s B pattern in this class, which is translated into English using the s-genitive. The pattern in Chinese is N₁ DEG N₂, see (14):

(14) 国家的荣誉18
“nation’s honor”
guójìa de róngyù
N PRT N
Generated in TypeCraft.

Class 3
Chang et al.’s A preposition B category, refers to a pattern where a number, percentage, or level word is related by de to the noun, which means A precedes B. This pattern is exemplified in (15):

(15) 一百万美金的房子19
“one million dollar house”
yì bǎiwàn měijīng de fángzi
NUM NUM N PRT N
Generated in TypeCraft.

Class 4
The B preposition A class contains different constructions. B and A may stand in an of-genitive or locative relation. This patterns found in this class are N₁ DEG N₂ or AP DEG N pattern. Our example (9) above illustrates the of-genitive constructions while (10) illustrates the locative construction.

Class 5
Class 5 involves relative clause. In this class, the syntactic pattern is RC DEC N, Xia (2000) tags de in these constructions as DEC (see example (7)).

18 http://typecraft.org/tc2/ntceditor.html#2884,448281
19 http://typecraft.org/tc2/ntceditor.html#2884,448282
Table 2 Chang (2009) and Xia (2000)’s classes of *de* in Chinese constructions

<table>
<thead>
<tr>
<th>Chang’s class</th>
<th>Syntactic pattern</th>
<th>Functional type</th>
</tr>
</thead>
<tbody>
<tr>
<td>A B</td>
<td>[ADJ DEG N]</td>
<td>adjectival modification</td>
</tr>
<tr>
<td></td>
<td>[PN DEG N]</td>
<td>possessive noun phrase</td>
</tr>
<tr>
<td></td>
<td>[N₁ DEG N₂]</td>
<td>nominal compounds</td>
</tr>
<tr>
<td>A’B</td>
<td>[N₁ DEG N₂]</td>
<td>s-genitive noun phrase</td>
</tr>
<tr>
<td>A preposition B</td>
<td>[NUM N₁ DEG N₂]</td>
<td>quantified or classified noun phrase</td>
</tr>
<tr>
<td>B preposition A</td>
<td>[N₁ DEG N₂]</td>
<td>of-genitive, composition</td>
</tr>
<tr>
<td></td>
<td>[AP DEG N]</td>
<td>locative noun phrase</td>
</tr>
<tr>
<td>Relative clause</td>
<td>[RC DEC N]</td>
<td>relative clause</td>
</tr>
</tbody>
</table>

In Table 2 the square brackets indicate the noun phrases. Part of speech labels represent the prototypical elements of this clause type. Note that we use the labels introduced by Chang and Xia in Table 2. It builds Chang et al. (2009)’s class system on the Chinese Treebank, making use of its tagging guidelines (Xia, 2000). The table above is thought to represent the main pattern of complex Mandarin noun phrases with particle *de*.

### 2.2 The Linguistic Literature

Shi and Li (2002) recognize four *de* constructions: relative clauses, genitive, adjectival and associate phrases. The following examples illustrate the classes identified by Shi and Li.

(a) Relative clause

(16) 教我数学的老师已经退休了

“The teacher who taught me math has already retired.”

jiāo wǒ shùxué de lǎoshī yǐjīng tuìxiū

V PN N PRT N ADV V

20 http://typecraft.org/tc2/ntceditor.html#2884,448283
le
AUX
Generated in TypeCraft.

(b) Genitive phrase

(17) 那个男孩的桌子非常漂亮
“That boy’s tables are very beautiful.”

nàgè nánhái de zhūzǐ fēicháng piàoliàng
that boy table very nice
PN N PRT N ADV ADJ
Generated in TypeCraft.

(c) Adjective phrase

(18) 干干净净的衣服别扔
“Don’t throw away those clean clothes.”

gāngānjìngjìng de yīfú bié rēng
clean cloth not throw
ADJ PRT N ADV V
Generated in TypeCraft.

(d) Associate phrase:

(19) 我见过北京的街道
“I saw the streets of Beijing.”

wǒ jiàn guò běijīng de jiēdào
I see pass Beijing street
PN V AUX Nploc PRT N
Generated in TypeCraft.

Yin (1990) also considered various kinds of attributive constructions in which de appears:
a. Noun or noun phrase + de

(20) 弟弟的书包
“brother’s bag”

dìdì de shūbāo
PN PRT N
Generated in TypeCraft.

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21 http://typecraft.org/tc2/ntceditor.html#2884,448284
22 http://typecraft.org/tc2/ntceditor.html#2884,448285
23 http://typecraft.org/tc2/ntceditor.html#2884,448345
24 http://typecraft.org/tc2/ntceditor.html#2884,448287
b. Pronoun or pronoun phrase + de

(21) 我的母亲
“my mother”

wǒ de mǔqīn
I mother
PN PRT N
Generated in TypeCraft.

c. Adjective or adjective phrase + de

(22) 红的花
“red flower”

hóng de huā
red flower
ADJ PRT N
Generated in TypeCraft.

d. Onomatopoeic word + de

(23) 哗哗的流水
“a burbling stream”

bībī de liúshuǐ
burbling stream
ADJ PRT N
Generated in TypeCraft.

e. Numeral-measure word phrase + de

(24) 一脸的汗水
“a face covered with sweat”

yī liǎn de hànshuǐ
one face sweat
Generated in TypeCraft.

25 http://typecraft.org/tc2/ntceditor.html#2884,448288
26 http://typecraft.org/tc2/ntceditor.html#2884,448289
27 http://typecraft.org/tc2/ntceditor.html#2884,448290
28 http://typecraft.org/tc2/ntceditor.html#2884,448291
NUM N PRT N
Generated in TypeCraft.

f. Postpositional phrase + de

(25) 桌子上的猫29
"the cat on the table"

zhuōzǐ shàng de māo
taxle on de cat
N PPOST PRT V
Generated in TypeCraft

g. Subject-predicate construction + de

(26) 我喜欢的老师30
"the teacher that I like"

wǒ xǐhuān de lǎoshī
I like de teacher
PN V PRT N
Generated in TypeCraft.

Table 3 Shi and Li (2002) and Yin (1990) classes of de

<table>
<thead>
<tr>
<th>Shi and Li (2002)</th>
<th>Functional type</th>
<th>Ying (1990)</th>
<th>Functional type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syntactic pattern</td>
<td></td>
<td>Syntactic pattern</td>
<td></td>
</tr>
<tr>
<td>[RC N]</td>
<td>relative clause</td>
<td>[RC N]</td>
<td>relative clause</td>
</tr>
<tr>
<td>[PN N]</td>
<td>possessive noun phrase</td>
<td>[PN N]</td>
<td>possessive noun phrase</td>
</tr>
<tr>
<td>[ADJ N]</td>
<td>adjectival modification</td>
<td>[ADJ N]</td>
<td>adjectival modification</td>
</tr>
<tr>
<td>[N1 N2]</td>
<td>associate noun phrase</td>
<td>[N1 N2]</td>
<td>s-genitive noun phrase</td>
</tr>
<tr>
<td>[PP N]</td>
<td>locative noun phrase</td>
<td>[PP N]</td>
<td>locative noun phrase</td>
</tr>
</tbody>
</table>

29 http://typecraft.org/tc2/ntceditor.html#2884,448292
30 http://typecraft.org/tc2/ntceditor.html#2884,448293
Table 3 Shi and Li (2002) and Yin (1990) classes of *de* (Continued)

<table>
<thead>
<tr>
<th></th>
<th>[IPHON N]</th>
<th>adjectival modification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[NUM N₁ N₂]</td>
<td>quantified noun phrase</td>
</tr>
</tbody>
</table>

Table 4 Comparison of NLP and linguistic literature classes of *de*

<table>
<thead>
<tr>
<th>NLP literature</th>
<th>Syntactic pattern</th>
<th>Functional type</th>
<th>Linguistic literature</th>
<th>Syntactic pattern</th>
<th>Functional type</th>
</tr>
</thead>
<tbody>
<tr>
<td>NLP class</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A B</td>
<td>[ADJ N]</td>
<td>adjectival modification</td>
<td>Adjectival phrase</td>
<td>[ADJ N]</td>
<td>adjectival modification</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>[IPHON N]</td>
<td>adjectival modification</td>
</tr>
<tr>
<td></td>
<td>[PN N]</td>
<td>possessive noun phrase</td>
<td>Pronoun phrase</td>
<td>[PN N]</td>
<td>possessive noun phrase</td>
</tr>
<tr>
<td></td>
<td>[N₁ N₂]</td>
<td>nominal compounds</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A is pre-posed B</td>
<td>[NUM N₁ N₂]</td>
<td>quantified or classified noun phrase</td>
<td></td>
<td>[NUM N₁ N₂]</td>
<td>quantified or classified noun phrase</td>
</tr>
<tr>
<td>B is pre-posed A</td>
<td>[N₁ N₂]</td>
<td>of-genitive, composition</td>
<td></td>
<td>[N₁ N₂]</td>
<td>associate noun phrase</td>
</tr>
<tr>
<td></td>
<td>[PP N]</td>
<td>locative noun phrase</td>
<td>Prepositional and postpositional phrase</td>
<td>[PP N]</td>
<td>locative noun phrase</td>
</tr>
</tbody>
</table>
Table 4 Comparison of NLP and Linguistic literature classes of *de* (Continued)

<table>
<thead>
<tr>
<th>Relative clause</th>
<th>[RC N]</th>
<th>Relative clause</th>
<th>[RC N]</th>
<th>Relative clause</th>
</tr>
</thead>
</table>

Both NLP and the linguistic literatures characterize *de* as an element that relates the head noun to adjectives, numeral modifiers, quantifiers or relative clauses. In addition, *de* relates the head nouns that either stand in a possessive-, or more generally in an associate relation, to the modified noun. Especially when it comes to different types of nominal modifiers and to the different semantic relations between associated nouns, a more fine-grained classification would be helpful. In the next chapter, we will present a consolidated classification of *de* nominal constructions building on the existing classifications described so far.
Chapter 3. Classification of the Chinese *De* Constructions

In this chapter, we will focus on the nominal constructions contained in the TypeCraft Mandarin corpus. The Mandarin corpus consists of 563 in-depth annotated sentences, and a POS-tagged news corpus, which was imported from the Lancaster corpus to TypeCraft. This corpus consists of another 2819 sentences. We will not discuss this news corpus in this thesis. For our work, we focus on the 563 sentences, which contain gloss tags, along with POS (part of speech) tags. In addition to POS and gloss tags, TypeCraft also allows sense tags. The TypeCraft annotations’ sets and their size are listed in Table 5:

<table>
<thead>
<tr>
<th>Data type</th>
<th>Data count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloss tags</td>
<td>360</td>
</tr>
<tr>
<td>Part-of-speech tags</td>
<td>101</td>
</tr>
<tr>
<td>Sense tags</td>
<td>53</td>
</tr>
</tbody>
</table>

In the Mandarin corpus we found 213 phrases that contain the particle *de*, which corresponds to 37.8% of our sentences. An overview of our corpus is given in Figure 1 and Figure 2:

Search result (3 texts found):

<table>
<thead>
<tr>
<th>Title</th>
<th>Title translation</th>
<th>Contributor</th>
<th>Sentence count</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>De</em> within nominal projections</td>
<td></td>
<td>Yutong Pu</td>
<td>164</td>
</tr>
<tr>
<td>小鳥</td>
<td>For the bird</td>
<td>Yutong Pu</td>
<td>17</td>
</tr>
<tr>
<td>西蒙的猫</td>
<td>Simon's cat</td>
<td>Yutong Pu</td>
<td>33</td>
</tr>
</tbody>
</table>

Figure 1 TypeCraft linguistic collection and narrations created by the author
Search result (19 texts found):

<table>
<thead>
<tr>
<th>Title (Chinese)</th>
<th>Title translation</th>
<th>Contributor</th>
<th>Sentence count</th>
</tr>
</thead>
<tbody>
<tr>
<td>西蒙的猫 20 个 V-V 结构（Xīménɡ de māo）</td>
<td>Simon's cat (20 V-V patterns)</td>
<td>Miaomiao Zhang</td>
<td>20</td>
</tr>
<tr>
<td>西蒙的猫</td>
<td>Simon's cat</td>
<td>Qingqing Wang</td>
<td>36</td>
</tr>
<tr>
<td>苏菲的世界</td>
<td>Sophie's World (Data Collection)</td>
<td>Qingqing Wang</td>
<td>20</td>
</tr>
<tr>
<td>汉语普通话中的 V-V 结构 1（54个句子来自会议文章）</td>
<td>V-V patterns in Mandarin 1 (54 sentences from monographs and conference articles)</td>
<td>Miaomiao Zhang</td>
<td>54</td>
</tr>
<tr>
<td>汉语普通话中的 V-V 结构 2（98个句子来自书籍和会议文章）</td>
<td>V-V patterns in Mandarin 2 (98 sentences from monographs, conference articles and the Mandarin Grammar online (ManGO))</td>
<td>Miaomiao Zhang</td>
<td>98</td>
</tr>
<tr>
<td>不及物动词, 及物动词, 双宾语动词</td>
<td>verbs with various number of arguments (N.B: not natural examples)</td>
<td>Qingqing Wang</td>
<td>3</td>
</tr>
<tr>
<td>从修饰短语中的‘的’看中文定语短语的结构</td>
<td>On the Status of 'Modifying' DE and the Structure of the Chinese DP</td>
<td>Qingqing Wang</td>
<td>10</td>
</tr>
</tbody>
</table>

Figure. 2 Additional TypeCraft texts used for this thesis

Since some sentences contained more than one instance of *de*, we found 272 instances of *de* in total. My count also includes instances of *de* that are sentence final markers, which we will not discuss in this thesis, as our focus is on the nominal phrases. Based on our
TypeCraft corpus we now describe different types of noun phrases containing the particle *de* from the syntactic and the semantic perspective.

### 3.1 Adjectival modification

In Mandarin Chinese, nouns modified by an adjective are often preceded by *de* (Yip & Dong, 2006). If the adjective has more than one syllable (Yip & Rimmington, 2006), the particle *de* is generally used, as in example (27) below:

(27) 小鸟们没有美丽的羽毛了。31
"The little birds do not have feathers now."

```
xiao  niao  men  mei  you  meili  de
little  bird  not  have  beautiful  
ADJ   CN    PRT   ADV  V    ADJ    PRT
```

In this example, *meili* (*beautiful*) is a polysyllabic adjective, which means *de* is needed to connect adjective and head noun. When the adjective is a monosyllabic word, *de* can be omitted (Yip & Rimmington, 2006). Normally, monosyllabic adjectives are placed directly before nouns *hao* (*good*) *shu* (*book*) as in (28), unless the adjective is preceded by an adverb of degree (Yip & Rimmington, 2006), like example (29):

(28) 好书32
"good book"

```
hao    shu
good    book
ADJ    N
```

---

31 [http://typecraft.org/tc2/ntceditor.html#2636,43261](http://typecraft.org/tc2/ntceditor.html#2636,43261)
32 [http://typecraft.org/tc2/ntceditor.html#2884,448201](http://typecraft.org/tc2/ntceditor.html#2884,448201)
(29) 这时更多的鸟飞了过来。33
“At this time, many more birds fly to the wire.”

In example (28), the monosyllabic adjective 好 (good) is placed directly before the noun 书 (book) and de is omitted in this case, while in example (29), when the adjective 多 (many) is preceded by an adverb of degree 更 (more), de is placed after the monosyllabic adjective 多 (many). When it is a polysyllabic adjective by an adverb of degree, de is obligatory as well. It is important to note that monosyllabic adjectives may form compound nouns together with a noun. The compound noun consists of multiple characters without de: they represent a single concept, which takes on a distinctive meaning, for example, 黄瓜 means cucumber and 黄 de 瓜 means melon with yellow color.

De cannot be omitted if the modifying adjective is duplicated. In example (30) we deal with a duplicated word.

(30) 红红的花34
“red flower”

3.2 Adpositional attributes
In Mandarin Chinese, locative noun phrases always contain adpositional phrases that can occur in both prepositional and postpositional phrases with de (Yip & Rimmington,

33 http://typecraft.org/tc2/ntceditor.html#2884,58543
34 http://typecraft.org/tc2/ntceditor.html#2884,448202
3.2.1 Prepositional phrase with *de*

It is common to use the preposition *zài* (*in, at*) followed by a location noun to modify a noun, such as in (31):

(31) 在花园的一角，那些果莓树丛后面有一片花草果树不生的浓密灌木林。  
“Down in a corner of the garden behind all the raspberry bushes was a dense thicket where neither flowers nor berries would grow.”

Zài (*in*) huāyuán (*garden*) is a prepositional phrase, which is related to the head noun it modifies, yijiao (*corner*), by the use of the particle *de*. In this configuration, the particle *de* normally cannot be omitted.

Turning now to co-verbs, in Mandarin Chinese, co-verbs resemble both verbs and prepositions. Like the co-verb *duì* (*to/toward*) in Chinese, it is used to indicate the concept of "to" or "towards" an object or target. This is illustrated in example (32):

(32) 对他的信任
“the trust towards him”

---

35 http://typecraft.org/tc2/ntceditor.html#2884,58512
36 http://typecraft.org/tc2/ntceditor.html#1820,35116
3.2.2 Postpositional phrase with *de*

Another more common form of locative modification involves postpositions like zhōng (*in*), lǐ (*in*), shàng (*at*). This configuration requires *de* to connect a postpositional phrase and a noun phrase as shown in (33):

(33) 她爬过那个小洞，就置身于灌木丛中的一个大洞穴。
*When she crawled through the grotto, she came into a large cave between the bushes.*

```
<table>
<thead>
<tr>
<th>tā</th>
<th>pá</th>
<th>guò</th>
<th>nèi</th>
<th>gè</th>
<th>xiăodòng</th>
</tr>
</thead>
<tbody>
<tr>
<td>she</td>
<td>crawl</td>
<td>across</td>
<td>that</td>
<td>CL</td>
<td>little.hole</td>
</tr>
<tr>
<td>PN</td>
<td>V1</td>
<td>V2</td>
<td>DET</td>
<td>CL</td>
<td>N</td>
</tr>
<tr>
<td>jiù</td>
<td>zhì</td>
<td>shēn</td>
<td>yū</td>
<td>guànmùcóng</td>
<td>zhōng</td>
</tr>
<tr>
<td>respect.of</td>
<td>put</td>
<td>body</td>
<td>at</td>
<td>bushes</td>
<td>in</td>
</tr>
<tr>
<td>CONJ</td>
<td>V</td>
<td>N</td>
<td>PREP</td>
<td>N</td>
<td>PPOST</td>
</tr>
<tr>
<td>gè</td>
<td>dà</td>
<td>dòngxué</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLF</td>
<td>large</td>
<td>cave</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CL</td>
<td>ADJ</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

In (33) zhōng (*between, in*) is the postposition following the noun guànmùcóng (*bushes*). In this case the postpositional phrase modifies a noun phrase dàdòngxué (*a large cave*).

3.3 Pronominal modification

Pronouns, such as personal pronouns, demonstrative pronouns, interrogative pronouns and other pronouns, combine with head nouns to form different types of noun phrases. (Yip & Rimmington, 2006)

3.3.1 Personal pronouns

In Mandarin Chinese, *personal pronoun + de* is used to form a possessive expression such as example (34):

(34) 大鸟看到他们的样子笑了起来。
*The big bird laughed when he saw them.*

```
da  niăo  kăn  dào  tā  men  de
```

37 http://typecraft.org/tc2/ntceditor.html#2884,58513
38 http://typecraft.org/tc2/ntceditor.html#2884,58500
While possessive modification requires common nouns with the presence of *de*, this is not the case for kinship terms, for example (35):

(35) 我爸爸
“my dad”

wǒ     bàba
I       dad
PN      N

Wǒ (*I*) bàba (*dad*) and wǒ (*I*) de bàba (*dad*) are both grammatical, because bàba (*dad*) is a kinship term that refers to a relative. *De* can be omitted in (35). Predicative structures are a different matter: *de* cannot be omitted (36).

(36) 这是我的
“This is mine.”

zhè     shì     wǒ     de
this     is      I      *de*
PN      V      PN      PRT

(37) shows that when a noun is combined with a numeral in a partitive construction, a preceding possessive must be followed by *de*:

---

39 http://typecraft.org/tc2/ntceditor.html#2884,448188
40 http://typecraft.org/tc2/ntceditor.html#2884,448189
(37) 他的一个孩子
“one of his children”

Generated in TypeCraft.

### 3.3.2 Demonstrative pronouns

Zhè (this) and nà (that) are Mandarin demonstratives (Yip & Rimmington, 2006). When these demonstrative pronouns are followed by the particle de, a locative expression is created, as shown in example (38):

(38) 这的酒店很好。
“The hotel here is very nice.”

Generated in TypeCraft.

When demonstratives are used with numeral measure words and a possessive is also present, the order is the possessive pronoun, demonstrative, numeral, classifier, and noun. De usually follows the personal pronoun, such as in (39):

(39) 我的这三本书
“these three books of mine”

Generated in TypeCraft.

---

41 [http://typecraft.org/tc2/ntceditor.html#2884,448191](http://typecraft.org/tc2/ntceditor.html#2884,448191)
42 [http://typecraft.org/tc2/ntceditor.html#2884,448193](http://typecraft.org/tc2/ntceditor.html#2884,448193)
43 [http://typecraft.org/tc2/ntceditor.html#2884,448192](http://typecraft.org/tc2/ntceditor.html#2884,448192)
What we need to point out is that demonstrative pronouns with *de* and without *de* have different expressions. When the demonstrative pronoun is accompanied by *de*, it creates a locative expression, like example (38), while it refers to a definite article without *de* (40):

(40) 这书店关门了  **44**
   “*This book store is closed.*”

zhè shū diàn guān mén le
this book store close door
PN N N V N AUX
Generated in TypeCraft.

3.3.3 Interrogative pronouns

The main interrogative pronouns followed by *de* in Mandarin Chinese are *shuí* (*who*) and *nǎ* (*where*) (Yip & Rimmington, 2006). Just like the personal pronoun, the interrogative pronoun also receives a possessive interpretation when followed by the particle *de*, as shown in example (41) and (42):

(41) 这是谁的行李?  **45**
   “*Whose luggage is this?*”

zhè shì shuí de xíngli ?
this is who luggage
PN V PN PRT N PUN
Generated in TypeCraft.

In example (41), *shuí* (*who*), when followed by *de*, receives a possessive interpretation and *de* cannot be omitted, while in example (42), *de* is optional.

(42) 你是哪的人?  **46**
   “*Where are you from?*”

nǐ shì nǎ de rén
you is where people

---

44 [http://typecraft.org/tc2/ntceditor.html#2884,448347](http://typecraft.org/tc2/ntceditor.html#2884,448347)
45 [http://typecraft.org/tc2/ntceditor.html#2884,448194](http://typecraft.org/tc2/ntceditor.html#2884,448194)
46 [http://typecraft.org/tc2/ntceditor.html#2884,448195](http://typecraft.org/tc2/ntceditor.html#2884,448195)
3.3.4 Other pronouns

There are some other pronouns in Chinese, such as dājiā (everyone), zījǐ (oneself), rēnjiā (other). Some linguists (e.g. Yip and Rimmington (2006)) classify these pronouns separately, and we will consequently discuss in an independent section in this thesis. De is obligatory when other pronouns are followed by de, for example (43):

(43) 大家的书

“everyone’s book”

dājiā        de        shū
everyone    book
PN            PRT      N

3.4 Noun – Noun constructions

N₁ N₂ construction is either possessive or associative in nature. Additionally, we find constructions with numeral-measure words.

3.4.1 N₁ + de + N₂

The particle de occurs between two nominals, indicating possession (44) or close association (45):

(44) 西蒙的猫看见了一只苍蝇。Simon's cat saw a fly.

xīmĕng       de        māo        kàn        jiàn        le        yī        zhī
simon        cat        see        meet        one
N₁           PRT       N₂        V₁        V₂        PRT       NUM        CLFnum

cāngyīng
fly
CN

47 http://typecraft.org/tc2/ntceditor.html#2884,448197
48 http://typecraft.org/tc2/ntceditor.html#2884,58531
(44) is a possessive construction. \(N_2\) cat belongs to \(N_1\) Simon.

(45) 我们已经看到他们如何试图为大自然的变化寻求自然的解释
“We have seen how they tried to find a natural explanation for the change(s) in nature.”

wǒmen yǐjīng kàn dào tāmen rúhé shìtú wèi dàzìrán
we already saw reach they how try for nature
PN ADV V1 V2 PN ADV V PREP N

de biànhuà xúnqiú zìrán de jiěshì
PART change seek natural Adj.Suffix explanation
PRT N V N PRT N

Generated in TypeCraft.

In example (45), the construction \(N_1\) (dàzìrán: nature) + \(de\) + \(N_2\) (biànhuà: change) is an associate phrase.

3.4.2 Numeral-measure word \(N_1 + de + N_2\)

This pattern consists of a numeral classifier noun and another noun (46):

(46) 两百美金的书
“two hundred dollar book

liǎng bǎi měijīng de shū
two hundred dollar book
NUM NUM N PRT N

Generated in TypeCraft.

3.5 Relative clauses

Chinese RCs precede their head nouns (Hsiao & Gibson, 2003). They can either be subject-extracted relative clauses or object-extracted relative clauses. \(De\) serves to combine the relative head and the relative clause. Example (47) illustrates a subject-extracted relative clause and (48) is an object-extracted one:

---

49 http://typecraft.org/tc2/ntceditor.html#2884,58518
50 http://typecraft.org/tc2/ntceditor.html#2884,448198
(47) 教我数学的老师
teach me math

“the teacher who taught me math”

Generated in TypeCraft.

(48) 那边有一本我要研究的书。

“There is a book that I want to research.”

Generated in TypeCraft.

In this chapter, we have discussed classes of nominal *de* constructions. We found five general classifications: nouns modified by adjectives, nouns combining with the adpositional phrase, nouns modified by pronouns, noun-noun modifications and nouns modified by relative clauses. We can summarize our findings as follows:

Class1: ADJ *de* N,

Class2: AP *de* N, (where AP stands for adpositional phrase)

Class3: PN *de* N,

Class4: N₁ *de* N₂,

Class5: RC *de* N.

---

51 http://typecraft.org/tc2/ntceditor.html#2884,58551
52 http://typecraft.org/tc2/ntceditor.html#2884,58494
Table 6 The classifications of *de* construction

<table>
<thead>
<tr>
<th>The classes of *de-*construction</th>
<th>Syntactic pattern</th>
<th>Types of noun phrase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjectival modification</td>
<td>adjectives with <em>de</em></td>
<td>[ADJ N]</td>
</tr>
<tr>
<td>Adpositional attributes</td>
<td>prepositional phrases with <em>de</em></td>
<td>[AP N]</td>
</tr>
<tr>
<td></td>
<td>postpositional phrases with <em>de</em></td>
<td></td>
</tr>
<tr>
<td>Pronominal modification</td>
<td>personal pronouns</td>
<td>[PN N]</td>
</tr>
<tr>
<td></td>
<td>demonstrative pronouns</td>
<td></td>
</tr>
<tr>
<td></td>
<td>interrogative pronouns</td>
<td></td>
</tr>
<tr>
<td></td>
<td>other pronouns</td>
<td></td>
</tr>
<tr>
<td>Noun – noun constructions</td>
<td>$N_1 + de + N_2$</td>
<td>[N$_1$ N$_2$]</td>
</tr>
<tr>
<td></td>
<td>numeral-measure word $N_1 + de + N_2$</td>
<td>[NUM N$_1$ N$_2$]</td>
</tr>
<tr>
<td>Relative clauses</td>
<td>subject-extracted relative clauses</td>
<td>[RC N]</td>
</tr>
<tr>
<td></td>
<td>object-extracted relative clauses</td>
<td></td>
</tr>
</tbody>
</table>

We have given a more detailed description of noun phrases containing *de*-expressions building on the classifications that we have found in the NLP and linguistic literatures. For example, we recognized the class of adpositional modification, and presented prepositional and postpositional phrases. Also, with respect to pronominal modification, we recognized several subtypes of pronominal modification, such as modification by the personal pronoun, demonstrative, interrogative, and other pronouns. We explored the different meanings of demonstrative pronouns with *de* and without *de*. Noun-noun constructions and relative clause modification also played an important role in our presentation.
This chapter has given a detailed systematic presentation of nominal constructions. We have used examples from the TypeCraft Mandarin corpus to illustrate each class. Our data is open access and through the URLs that we provide the reader has direct access to our corpus online.
Chapter 4. The Order of Sequential Attributives

When several types of attributives occur in one phrase in Chinese, certain rules apply. The previous chapter presented five general classifications of nominal *de* constructions: adjectival, adpositional, pronominal, nominal attributes and verbal attributes in the form of relative clauses. This chapter will explore the order of sequential attributives of these five general classifications, and we will only discuss two sequential attributives in each phrase or sentence in this chapter. One *de* tends to be omitted after an attribute in some examples. The data that I will present in this section is taken from dialogues, newspapers, books, articles and social media. I have imported the examples in this chapter into TC for further annotation53.

4.1 Adjectival attributes

In this section, we will discuss how to order the adjectival attributes relative to the other possible attributes.

4.1.1 Adjectival attributes and adpositional attributes

When an adjectival attribute co-occurs with an adpositional attribute, the adpositional attributes will consistently precede the adjectival attributes. The pattern is AP ADJ N, and it is exemplified in (49) and (50):

(49) (在)街角安静的咖啡店54
“the quiet cafe in the corner”

<table>
<thead>
<tr>
<th>zài</th>
<th>jiējiǎo</th>
<th>ānjìng</th>
<th>de</th>
<th>kāfēidiàn</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREP</td>
<td>N</td>
<td>ADJ</td>
<td>PRT</td>
<td>N</td>
</tr>
</tbody>
</table>

In (49) the prepositional phrase precedes the adjective. The same is the case for the postpositional phrase in (50):

53 http://typecraft.org/tc2/ntceditor.html#2884
54 http://typecraft.org/tc2/ntceditor.html#2884,448203
(50) 水下美丽的鱼儿

"the beautiful fish under the water"

shuǐ xià měili de yúer
water under beautiful fish
N PPOST ADJ PRT N
Generated in TypeCraft.

4.1.2 Adjectival attributes and pronominal attributes

Ordering constraints also apply when adjectival attributes co-occur with personal pronouns. The order is PN ADJ N, as in example (51):

(51) 我美丽的妈妈

"my beautiful mother"

wǒ měili de māma
I beautiful mother
PN ADJ PRT N
Generated in TypeCraft.

Demonstrative pronouns precede adjectival attributes, as shown in example (52):

(52) 这奢华的酒店

"this luxurious hotel here"

zhè shēhuá de jiǔdiàn
this luxurious hotel
PN ADJ PRT N
Generated in TypeCraft.

There is no example when interrogative pronouns co-occur with adjectival attributes.

In chapter 3 we mentioned dàjiā (everyone) and zījī (myself). These pronouns also precede attributive adjectives.

55 http://typecraft.org/tc2/ntceditor.html#2884,448204
56 http://typecraft.org/tc2/ntceditor.html#2884,448205
57 http://typecraft.org/tc2/ntceditor.html#2884,448206
4.1.3 Adjectival attributes and nominal attributes

In chapter 3, we discussed three different nominal attributes. When adjectival attributes co-occur with nominal attributes indicating possession, such as someone’s name, relatives (family members), institution or organization, the nominal attributes will precede the adjectival attributes, creating the pattern \( N_1 \text{ ADJ } N_2 \). Consider (54):

(54) 姐姐的蓝色裙子
“my sister’s blue skirt”

\[
\begin{array}{cccc}
\text{jiějie} & \text{de} & \text{lánsè} & \text{qúnzi} \\
\text{sister} & \text{blue} & \text{skirt} \\
\text{N} & \text{PRT} & \text{ADJ} & \text{N}
\end{array}
\]

Generated in TypeCraft.

Other nominal attributes indicating close association precede adjectival attributes; the pattern is \( N_1 \text{ ADJ } N_2 \), as shown in (55):

(55) 那封信的神秘回复
“the mysterious response to that letter”

\[
\begin{array}{cccc}
nà fēng xìn de shénmì huífù \\
that letter mysterious response \\
\text{PN CLF N PRT ADJ N}
\end{array}
\]

Generated in TypeCraft.

Numeral-measure words behave just like other nominal attributes and precede the adjectival attributes in the pattern \([(\text{NUM}) \text{ N_1}] \text{ ADJ } N_2 \) (56):

---

58 http://typecraft.org/tc2/ntceditor.html#2884,448208
59 http://typecraft.org/tc2/ntceditor.html#2884,448209
60 http://typecraft.org/tc2/ntceditor.html#2884,448210
(56) 两百万美金奢华的房子
“a luxurious house worth two million dollars”

liǎng bǎiwàn měijīng shēhuá de fángzi

NUM NUM N ADJ PRT N

4.1.4 Adjectival attributes and verbal attributes

For subject-extracted relative clauses the pattern is RC ADJ N, for example (57):

(57) 教我数学的年轻老师
“the young teacher who taught me math”

jiào wǒ shùxué de niánqīn lăoshī
teach I mathematics young teacher
V PN N PRT ADJ N

Finally, we can look at object-extracted relative clauses, which also precede adjectives.

The pattern here is RC ADJ N (58):

(58) 我要研究的深奥的书
“a profound book that I want to research”

wǒ yào yánjiū de shēngào de shū
I want research profound book
PN V V PRT ADJ PRT N

We observed that under double modification the adjective is always the modifier occurring closest to the head noun in the following pattern:

61 http://typecraft.org/tc2/ntceditor.html#2884,448211
62 http://typecraft.org/tc2/ntceditor.html#2884,448212
63 http://typecraft.org/tc2/ntceditor.html#2884,448213
Table 7 The order of adjectival attributes and the other attributes

<table>
<thead>
<tr>
<th>Type of attributive</th>
<th>Syntactic pattern</th>
<th>The order of two attributives</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADJ AP</td>
<td>AP ADJ N</td>
<td>AP&gt;ADJ</td>
</tr>
<tr>
<td>ADJ PN</td>
<td>PN ADJ N</td>
<td>PN&gt;ADJ</td>
</tr>
<tr>
<td>ADJ N</td>
<td>[(NUM) N₁ ADJ N₂]</td>
<td>N₁&gt;ADJ</td>
</tr>
<tr>
<td>ADJ RC</td>
<td>RC ADJ N</td>
<td>RC&gt;ADJ</td>
</tr>
</tbody>
</table>

Note: A>B means A precedes B.

This finding indicates that, if the phrases have adjectival attributes and other attributes, the other attributes will always precede the adjectival attributes.

4.2 Adpositional attributes

4.2.1 Adpositional attributes and pronominal attributes

Let us first consider the case where adpositional attributes combine with pronominal attributes. The latter come in four different categories, which are personal pronouns, demonstrative pronouns, interrogative pronouns and other pronouns. We first describe the combination with personal pronouns. The patterns that we observed are AP PN N and PN AP N, as in (59) and (60):

(59) 我在湖边的同学⁶⁴
    “my classmate by the lake”
    wǒ zài hú biān de tóngxué
    I at lake side classmate
    PN PREP N N PRT N

(60) 在湖边的我同学⁶⁵
    “my classmate by the lake”
    zài hú biān de wǒ tóngxué
    at lake side I classmate

⁶⁴ http://typecraft.org/tc2/ntceditor.html#2884,448222
⁶⁵ http://typecraft.org/tc2/ntceditor.html#2884,448214
The configuration shown in (60) is not common, and example (60) cannot be considered an everyday phrase in Chinese. Zàihúbiān (by the lake) is a locative modification, rather than a possessive modification wǒ (I), and is consequently positioned closer to the head noun. The pattern PN AP N is correct. Also relative to the demonstrative pronouns are zhè (this) and nà (that). We observe the patterns PN AP N and AP PN N, such as (61) and (62):

(61) 在北京的那些酒店
“these hotels in Beijing”

zái běijīng de nàxiē jiǔdiàn
at Beijing these hotel

(62) 那些在北京的酒店
“these hotels in Beijing”

nàxiē zài běijīng de běijīng
these in Beijing hotel

When a demonstrative pronoun and an adpositional attribute co-occur, the pattern is AP PN N or PN AP N. Both patterns are correct. There is no example relative to the occurrence of an interrogative pronoun and an adpositional attribute.

The pattern already observed for personal pronouns can also be found with dàjiā (everyone), zìjǐ (oneself), rénjiā (other). We observe (63) and (64).

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66 http://typecraft.org/tc2/ntceditor.html#2884,448216
67 http://typecraft.org/tc2/ntceditor.html#2884,448360
4.2.2 Adpositional attributes and nominal attributes

Turning now to possessive in combination with adpositional attributes, we observe the following pattern AP N₁ N₂ or N₁ AP N₂, as in (65) and (66):

(65) 爸爸在上海的朋友
“dad's friend in Shanghai”

bàbà  zài  shànghǎi  de  péngyǒu
dad  at  Shanghai  friend
N  PREP  Nploc  PRT  N
Generated in TypeCraft.

(66) 在上海爸爸的朋友
“everyone's friend in Shanghai”

zài  shànghǎi  bàbà  de  péngyǒu
at  Shanghai  dad  friend
PREP  Nploc  N  PRT  N
Generated in TypeCraft.

Example (64) cannot be considered an everyday phrase in Chinese. Zàiběijīng (in Beijing) is a locative modification, rather than a possessive modification dàjiā (everyone), and is consequently positioned closer to the head noun. The pattern is again PN AP N.
Example (66) is likely to cause ambiguity. It is hard to distinguish whether zàishànghǎi (in Shanghai) modifies bàbà (father) or péngyǒu (friend). Same as the previous one, a locative modification, rather than a possessive modification, and is consequently positioned closer to the head noun. The pattern is N₁ AP N₂. When the nominal attributes indicate close association, the pattern is same as the previous one, as illustrated in example (67) and (68):

(67) 学校在上海的校区⁷²
“school campus in Shanghai”

```
xuéxiào  zài  shànghǎi  de  xiàoqū
school  at  Shanghai  campus
N  PREP  Nploc  PRT  N
```

Generated in TypeCraft.

(68) 在上海的学校的校区 *⁷³

```
zài  shànghǎi  de  xuéxiào  de  xiàoqū
at  Shanghai  school  campus
PREP  Nploc  PRT  N  PRT  N
```

Generated in TypeCraft.

As example (66), example (68) is ambiguous: it is difficult to tell whether zàishànghǎi (in Shanghai) modifies xuéxiào (school) or xiàoqū (campus). The correct pattern is N₁ AP N₂. Combing adpositional modifiers with numeral measure noun attributes, we observe the pattern shown in (69) and (70):

(69) 在香港一百万港币的房子⁷⁴
“a million HK dollar house in Hong Kong”

```
zài  xiānggǎng  yì  bǎiwàn  gǎngbì  de  fángzi
at  HongKong  one  million  HKdollar  house
PREP  Nploc  NUM  NUM  N  PRT  N
```

(70) 一百万港币在香港的房子⁷⁵
“a million HK dollar house in Hong Kong”

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⁷² http://typecraft.org/tc2/ntceditor.html#2884,448231
⁷³ http://typecraft.org/tc2/ntceditor.html#2884,448232
⁷⁴ http://typecraft.org/tc2/ntceditor.html#2884,448233
⁷⁵ http://typecraft.org/tc2/ntceditor.html#2884,448234
In example (69) and (70), the pattern is AP NUM N₁ N₂ or NUM N₁ AP N₂. Adpositional attributes and numeral-measure nominal attributes could be both given precedence, depending on which carries the emphasis. Example (69) emphasizes a million HK dollars, and example (70) emphasizes in Hong Kong. The attributes, which carry the emphasis, will be positioned closer to the head noun.

4.2.3 Adpositional attributes and verbal attributes

Turning now to relative clauses, we observe both pattern AP RC N and pattern RC AP N, as shown in (71) and (72):

(71) 在上海教我数学的老师

"the teacher who taught me math in Shanghai"

zài shànghǎi jiāo wǒ shùxué de
at ShangHai teach I mathematics de
PREP Nploc V PN N PRT

lǎoshī
teacher
N

Generated in TypeCraft.

(72) 教我数学的在上海的老师

"the teacher who taught me math is in Shanghai"

jiāo wǒ shùxué de zài shànghǎi de
teach I mathematics de at ShangHai de
V PN N PRT PREP Nploc PRT

lǎoshī
teacher
N

76 http://typecraft.org/tc2/ntceditor.html#2884,448235
77 http://typecraft.org/tc2/ntceditor.html#2884,448236
Example (71) and (72) are both correct syntactically, but different semantically. Example (71) emphasizes jiāowǒshùxué (teach me math) while example (72) emphasizes zǎishānghǎi (in Shanghai). So, as in: “the teacher WHO TAUGHT ME MATH in Shanghai” (71) as opposed to “the teacher who taught me math is IN SHANGHAI NOW” (72). The configuration shown in (72) is not common, and example (72) cannot be considered an everyday phrase in Chinese. The pattern is AP RC N. The same is true for object-extracted relative clauses such as (73) and (74):

(73) 在海边玩沙子的孩子
“the child who played in the sand by the sea”

zài hǎi biān wán shānzi de háizi
at sea side play sand child

Generated in TypeCraft.

(74) 玩沙子的在海边的孩子
“the child who played in the sand by the sea”

wán shānzi de zài hǎi biān de háizi
play sand at sea side child

Generated in TypeCraft.

Example (73) emphasizes wánshāzi (play in the sand) and example (74) emphasizes zāihǎibiān (by the sea). So, as in: “the child who PLAYED IN THE SAND by the sea” (73) as opposed to “The child who played in the sand is BY THE SEA” (74). Example (74) cannot be considered an everyday phrase in Chinese. The correct pattern is AP RC N. In this part, we discussed the order of adpositional attributes and other attributes. The patterns are summarized in Table 8.

78 http://typecraft.org/tc2/ntceditor.html#2884,448557
79 http://typecraft.org/tc2/ntceditor.html#2884,448558
Table 8 The order of adpositional attributes and the other attributes

<table>
<thead>
<tr>
<th>Type of attributive</th>
<th>Syntactic pattern</th>
<th>The order of two attributives</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP PN</td>
<td>PN AP N</td>
<td>PN &gt; AP</td>
</tr>
<tr>
<td></td>
<td>AP PN N</td>
<td>PN(demonstrative pronouns) =AP</td>
</tr>
<tr>
<td>AP N</td>
<td>N_1 AP N_2</td>
<td>N_1 &gt; AP</td>
</tr>
<tr>
<td></td>
<td>[NUM N_1] AP N_2</td>
<td>[NUM N_1] = AP</td>
</tr>
<tr>
<td></td>
<td>AP [NUM N_1] N_2</td>
<td></td>
</tr>
<tr>
<td>AP RC</td>
<td>RC AP N</td>
<td>AP &gt; RC</td>
</tr>
<tr>
<td></td>
<td>AP RC N</td>
<td></td>
</tr>
</tbody>
</table>

Note: A>B means A precedes B.  
A=B means A could be either before or after B.

Table 8 shows the order of sequential attributives that contain adpositional attributes and other attributes. The pronominal attributes precede the adpositional attributes. Unless the pronominal attributes are the demonstrative pronouns, the demonstrative pronouns could be either before or after the adpositional attributes. The nominal attributes indicating possession or close association precede the adpositional attributes. The numeral-measure nominal attributes can be placed either before or after the adpositional attributes, depending on which attributes are emphasized. The emphasized attributes are closer to the modified noun. The adpositional attributes precede the verbal attributes in the form of relative clauses.

4.3 Pronominal attributes

4.3.1 Pronominal attributes and nominal attributes

We will now explore the order of modification element focusing on pronouns. When a personal pronoun and a noun phrase indicating possession co-occur, the personal pronoun precedes the nominal attribute indicating possession, giving rise to the pattern PN N_1 N_2, for example (75):
The same holds for nominal modifiers indicating close association and numeral-measure word noun phrases as the attributes (76) and (77):

(76) 我学校的校服81
“my school's uniform”

wǒ xuéxiào de xiàofū
I school uniform

PN N PRT N
Generated in TypeCraft.

(77) 她一百万美金的房子82
“her one million dollars house”

tā yì bǎiwàn měijīng de fàngzi
she one million dollar house

PN NUM NUM N PRT N
Generated in TypeCraft.

Demonstrative pronoun precedes noun phrase indicating close association, which means the pattern will be PN N₁ N₂ as in (78):

(78) 这酒店的窗户不干净83
“The window of this hotel is not clean.”

zhè jiǔdiàn de chuānghu bù gānjìng
this hotel window not clean

PN N PRT N ADV ADJ
Generated in TypeCraft.

80 http://typecraft.org/tc2/ntceditor.html#2884,448241
81 http://typecraft.org/tc2/ntceditor.html#2884,448242
82 http://typecraft.org/tc2/ntceditor.html#2884,448243
83 http://typecraft.org/tc2/ntceditor.html#2884,448247
The same holds for numeral-measure word nouns. Here, too, the pattern is PN NUM N1 N2, for example (79):

(79) 这一百万美金的房子真是太贵了
“One million dollars house is too expensive here.”

zhè yī bǎiwàn měijīng de fángzi shì tài guì le
this one million dollar house is too expensive
PN NUM NUM N PRT N V ADV ADJ AUX
Generated in TypeCraft.

We could not find an example in which both a demonstrative pronoun and a nominal attribute indicating possession co-occurred. There is no example of an interrogative pronoun with a nominal attribute as well. The last type of pronoun is other pronouns, which could also add the suffix de. In this case, other pronouns precede the nominal attributes indicating possession, which means the pattern is PN N1 N2, like example (80):

(80) 大家爸爸的水平都很高。
“The skills of everyone's father are very high.”

dàjiā bàba de shuǐpín dōu hěn gāo 。
everyone father skill all very high
PN N PRT N ADV ADV ADJ PUN
Generated in TypeCraft.

The same holds for nominal attributes indicating close association:

(81) 人家学校的操场很大。
“The playground of the other's school is big.”

ránjiā xuéxiào de cāochǎng hěn dà 。
other school playground very big
N N PRT N ADV ADJ PUN
Generated in TypeCraft.

For relative numeral-measure words, the order remains as described:

84 http://typecraft.org/tc2/ntceditor.html#2884,448248
85 http://typecraft.org/tc2/ntceditor.html#2884,448251
86 http://typecraft.org/tc2/ntceditor.html#2884,448252
(82) 别人几百美金的自行车不要乱借。
“Do not borrow the other's bike which is several hundred dollars.”

<table>
<thead>
<tr>
<th>biéren</th>
<th>jǐ</th>
<th>bǎi</th>
<th>měijīng</th>
<th>de</th>
<th>zìxíngchē</th>
<th>bú</th>
<th>yào</th>
</tr>
</thead>
</table>

luàn

<table>
<thead>
<tr>
<th>ADV</th>
<th>jiè</th>
</tr>
</thead>
</table>

In conclusion, when pronominal attributes and nominal attributes occur together, the order will be PN (NUM) N₁ N₂.

4.3.2 Pronomial attributes and verbal attributes

Let us now consider relative clauses, we observe the pattern PN RC N and RC PN N, for example (83) and (84):

(83) 她教数学的老师
“her teacher who taught math”

<table>
<thead>
<tr>
<th>tā</th>
<th>jiāo</th>
<th>shùxué</th>
<th>de</th>
<th>lǎoshī</th>
</tr>
</thead>
</table>

Generated in TypeCraft.

(84) 教数学的她老师*
“her teacher who taught math”

<table>
<thead>
<tr>
<th>jiāo</th>
<th>shùxué</th>
<th>de</th>
<th>tā</th>
<th>lǎoshī</th>
</tr>
</thead>
</table>

Generated in TypeCraft.

Tā (she) is a possessive modification to the head noun and jiāoshùxué (teach mathmatic) is a verbal attribute to the head noun. The verbal attributes, rather than the possessive

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87 http://typecraft.org/tc2/ntceditor.html#2884,448253
88 http://typecraft.org/tc2/ntceditor.html#2884,448256
89 http://typecraft.org/tc2/ntceditor.html#2884,448255
modifications, are consistently closer to the head noun. The pattern is PN RC N. When demonstrative pronouns combine with modificational verbal phrases, the order must be PN RC N, such as example (85):

(85) 这会说英文的老师很多。
“There are a lot of teachers here who can speak English.”

zhè huì shuō yīngwén de lǎoshī hěn duō。
this can speak English teacher very much
PN V V Np PRT N ADV ADJ PUN

Generated in TypeCraft.

There is no example when interrogative pronominal attributes and verbal attributes co-occur. However, when we combine other pronouns and a verbal attribute both orders will be possible:

(86) 大家会说法语的老师走了
“Everyone’s teacher who could speak French left.”

dàjiā huì shuō fǎyǔ de lǎoshī zǒu le
everyone can speak French teacher leave
PN V V PRT N V AUX

Generated in TypeCraft.

(87) 会说法语的大家的老师走了
“Everyone’s teacher who could speak French left.”

huì shuō fāyǔ de dàjiā de lǎoshī zǒu le
can speak French everyone teach leave
V V PRT PN PRT N V AUX

Generated in TypeCraft.

Huishuōfāyǔ (can speak French) is a verbal attribute to the head noun, rather than a pronominal attribute dàjiā (everyone), and is consequently positioned closer to the head noun. The correct pattern is PN RC N. To sum up, when the attributives contain the pronominal attributes and the verbal attributes, PN RC N is in order.

90 http://typecraft.org/tc2/ntceditor.html#2884,448259
91 http://typecraft.org/tc2/ntceditor.html#2884,448261
92 http://typecraft.org/tc2/ntceditor.html#2884,448262
In this section, we have discussed the order of pronominal attributes and other attributes. The pronominal attributes always precede the nominal attributes and the relative clauses.

### 4.4 Nominal attributes

Last but not least, we focus on the nominal attributes. We have already discussed most of the attributes with nominal attributes but not verbal attributes in the form of relative clauses. When the combination of attributives is a possessive noun and a relative clause, we observe the pattern: N₁ RC N₂ or RC N₁ N₂, such as (88) and (89):

(88) 小明会跳舞的妹妹出国了

“Xiao Ming’s sister who could dance went abroad.”

(89) 会跳舞的小明的妹妹出国了

Example (89) is likely to cause ambiguity. It is not clear to say whether the relative clause huitiàowǔ (can dance) modifies the second attributive xiàomíng (Xiao Ming: name) or the head noun mèimei (sister). The correct pattern will be N₁ de RC de N₂. The

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93 http://typecraft.org/tc2/ntceditor.html#2884,448264
94 http://typecraft.org/tc2/ntceditor.html#2884,448265
nominal attribute indicating possession precedes the verbal attribute. Nominal attribute indicating close association and relative clause combine as shown in (90) and (91):

(90) 学校可以容纳百人的体育馆关门了
“The school's gym which could contain hundreds of people is closed.”

(91) 可以容纳百人的学校的体育馆关门了

The same as example (89), example (91) is likely to cause ambiguity. It is difficult to distinguish whether the relative clause kěyìrónghǎirén (can contain one hundred people) modifies the attributive noun xuéxiào (school) or the head noun tǐyùguǎn (gym). The pattern N₁ RC N₂ is correct. Combining numeral-measure word noun phrase with subject-extracted relative clause, we get the pattern: NUM N₁ RC N₂ or RC NUM N₁ N₂ (92) and (93).

(92) 二十刀可以手写的手机不能买
“You can't buy the mobile phone which has hand-writing function with twenty dollar.

95 http://typecraft.org/tc2/ntceditor.html#2884,448266
96 http://typecraft.org/tc2/ntceditor.html#2884,448267
97 http://typecraft.org/tc2/ntceditor.html#2884,448269
(93) 可以手写的二十刀的手机不能买 98
“You can't buy the mobile phone which has hand-writing function with twenty dollar. ”

<table>
<thead>
<tr>
<th>Type of attributive</th>
<th>Syntactic pattern</th>
<th>The order of two attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>N RC</td>
<td>N₁ RC N₂</td>
<td>N₁ &gt; RC</td>
</tr>
<tr>
<td></td>
<td>[NUM N₁] RC N₂</td>
<td>[NUM N₁] = RC</td>
</tr>
<tr>
<td></td>
<td>RC [NUM N₁] N₂</td>
<td></td>
</tr>
</tbody>
</table>

Note: A>B means A precedes B.
A=B means A could be either before or after B.

Table 10 shows the order of nominal attributes and relative clauses. The nominal attributes precede the relative clauses, unless the nominal attributes are the numeral measure nouns, which could be either before or after the relative clauses. To summarize, the order of sequential attributives is given in Table 11:

98 http://typecraft.org/tc2/ntceditor.html#2884,448270
Table 11 The order of sequential attributives of *de* construction in Chinese

<table>
<thead>
<tr>
<th>Type of attributive</th>
<th>Syntactic pattern</th>
<th>The order of two attributives</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADJ AP</td>
<td>AP ADJ N</td>
<td>AP &gt; ADJ</td>
</tr>
<tr>
<td>ADJ PN</td>
<td>PN ADJ N</td>
<td>PN &gt; ADJ</td>
</tr>
<tr>
<td>ADJ N</td>
<td>[(NUM) N₁] ADJ N₂</td>
<td>N₁ &gt; ADJ</td>
</tr>
<tr>
<td>ADJ RC</td>
<td>RC ADJ N</td>
<td>RC &gt; ADJ</td>
</tr>
<tr>
<td>AP PN</td>
<td>PN AP N</td>
<td>PN &gt; AP</td>
</tr>
<tr>
<td></td>
<td>AP PN N</td>
<td>PN(demonstrative pronouns) = AP</td>
</tr>
<tr>
<td>AP N</td>
<td>N₁ AP N₂</td>
<td>N₁ &gt; AP</td>
</tr>
<tr>
<td></td>
<td>[NUM N₁] AP N₂</td>
<td>[NUM N₁] = AP</td>
</tr>
<tr>
<td></td>
<td>AP [NUM N₁] N₂</td>
<td></td>
</tr>
<tr>
<td>AP RC</td>
<td>RC AP N</td>
<td>AP &gt; RC</td>
</tr>
<tr>
<td></td>
<td>AP RC N</td>
<td></td>
</tr>
<tr>
<td>PN N</td>
<td>PN [(NUM) N₁] N₂</td>
<td>PN &gt; N₁</td>
</tr>
<tr>
<td>PN RC</td>
<td>PN RC N</td>
<td>PN &gt; RC</td>
</tr>
<tr>
<td>N RC</td>
<td>N₁ RC N₂</td>
<td>N₁ &gt; RC</td>
</tr>
<tr>
<td></td>
<td>[NUM N₁] RC N₂</td>
<td>[NUM N₁] = RC</td>
</tr>
<tr>
<td></td>
<td>RC [NUM N₁] N₂</td>
<td></td>
</tr>
</tbody>
</table>

Note: A>B means A precedes B.

A=B means A could be either before or after B.

This table indicates the order of sequential attributives of *de* constructions in Mandarin Chinese. The adjective attributes always occur closest to the nominal head, which means the order will be always AP/PN/N₁/RC ADJ N. The pronominal attributes precede the adpositional attributes. In this case, the order will be PN AP N, unless the pronominal attributes are demonstrative pronouns, the demonstrative pronouns could be either before or after the adpositional attributes (PN AP N or AP PN N). The nominal attributes go before the adpositional attributes, meaning that the order is N₁ AP N₂, unless the numeral
classifier nominal attributes can be positioned either before or after the adpositional attributes (NUM N₁ AP N₂ or AP NUM N₁ N₂). The adpositional attributes precede the verbal attributes in the form of relative clauses (AP RC N). The pronominal attributes precede the nominal attributes, meaning that the order is PN N₁. The pronominal attributes go before the relative clauses (PN RC N). When nominal attributes and relative clauses co-occur as the attributives, the nominal attributes precede the relative clauses, which means the order is N₁ RC, unless the relative clauses can be placed either before or after the numeral-measure nominal attributes (NUM N₁ RC N₂ or RC NUM N₁ N₂). To sum up, the order of sequential attributives can be concluded: PN>N₁>AP>RC>ADJ, unless the attributives are numeral measure words, numeral-measure nominal attributes could go before or after either verbal attributes or adpositional attributes (NUM N₁=RC and NUM N₁=AP). When the pronominal attributes are demonstrative pronouns, the demonstrative pronouns and the adpositional attributes can be both precedence. The order is PN (demonstrative pronouns)=AP. In spite of the fact that sequential modification is a common phenomenon, the linguistic as well as the NLP literatures pay little attention to this fact, which justifies the detail with which we have treated sequential modification in this chapter.
Chapter 5. Conclusion

As a ubiquitous particle in Chinese noun phrases, *de* has different grammatical functions. It links attributive words or phrases to the head noun. Using our own and other public Mandarin data in TypeCraft, a user-driven online database for Interlinear Glossed Text, we studied adjectival, adpositional, pronominal, nominal and verbal attributes in the form of relative clauses. Our goal was to describe and give a systematic description of nominal *de* constructions. The result of our work is a more specific and more detailed description of nominal *de* constructions in Mandarin Chinese. So far little attention has been given to sequential modification in detail. Our detailed description of different combinations of two modifiers thus covers relatively new ground, in particular when it comes to a detailed illustration of different patterns of linearization.

For this work, we have only used a small data set since time limits did not allow us to prepare the Lancaster Press Corpus for our purpose. The corpus is at this point only part of speech tagged. Working with a rather small data set might mean that when we extend our data sample that we have to add new classes to our system. We would not expect that the classes that we have described here in some detail become remain valid. In fact, it would have been desirable to work with a larger data set for example in order to pursue the issue of sequential modification.
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