Demonstratives, Numerals and Colour Terms in (Beijing) Mandarin[1]

Xuan Di
CASTL, Universitetet i Tromsø

1. Introduction

Sometimes, it seems that more than one lexical item with almost the same meaning can be used interchangeably (1a, b). Sometimes, phonological rules may be applied in explaining the relation between different forms (1c). However, when different forms give different semantics (1d), syntactic difference is expected.

(1) a. *Nana mai le* ***zhe(i)*** *ge*.
Nana buy LE this(one) CL $_{GE}$
"Nana bought this."

b. *yi* *shuang* ***hong*** ***((se)*** ***de)*** *shoutao*
one CL^{pair} red colour DE glove
"a pair of red gloves"

c. ***yi^{51}*** *zhi^{55} wan* ***yi^{35}*** *ge^{51} wan*
one CL bowl one CL bowl
"a bowl" "a bowl"
(tone sandhi of *yi*$^{51/35}$ due to tone of the CL, see §3)

d. *yi^{51} wan* *yi^{35} wan*
one bowl one bowl
"a bowl of" "a bowl"

In the present paper, data are arranged around the above Mandarin proximal demonstratives (Dem), colour terms and numeral (Num). I am going to show that in fact these interchangeable words have different meanings. Optionality is an illusion which will disappear once we look more carefully into their syntax. Language-internal parameters are also rooted in the lexicon: the complexity of different lexical items decides their syntactic distribution.

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The paper is organized as follows: In §2, I describe two forms of proximal demonstrative (*zhe* and *zhei*), which show different requirements w.r.t. an immediately following disagreeing classifier (CL) *ge*. This post-Dem *ge* is a disagreeing CL, not because *ge* is a "default classifier" (Borer 2005) that can be used "loosely" where one expects an agreeing CL, such a replacement is rarely acceptable among native speakers. I refer to the post-Dem *ge* as disagreeing CL because this is a position where an agreeing CL is not possible. Disagreeing *ge* doesn't license any numerals. Semantically, *zhe* imposes an exclusiveness meaning.

In §3, I describe the syntactic property for anti-sandhi numeral *yi* "one" directly preceding a (count) noun: yi^{35}-*N*. I suggest the derivation for a CL/Massifier is a set of operation (restricted ordered movements) that is parallel to the derivation of yi^{35}-*N*. And I discuss the interaction of numerals, CL and NP. In agreement with Zweig (2005), I show that numerals with different internal structures have different syntax; different from him, I show that there is more than just noun/adjective two types of numerals. Three types of additive number and one type of multiplicative number show different ellipsis pattern of CLs and the weight[2] of the last digit. The type of additives that CL and the lowest weight co-occur, has the parallel derivation as Dem *zhe*.

§4 extends *yi-N* style of derivation to "colour base" *SE "COLOUR"*, a morpheme that turns an NP colour term into a DP. The algorithm for selecting count noun in *yi-N* is applicable in deriving non-predicative colour adjectives. If some of the numerals are adjectives, the different derivations of adjectives echo the different derivations for numerals in §3.

2 Demonstrative

2.1 The required pointing gesture

In the answer to a *wh*-question, the reference of the nominal phrase (underlined in 2b) is new to the hearer. If we define *definite* as a noun phrase whose reference is known to both the speaker and the hearer, the new information NP is not definite[3].

(2) a. —— *ni mai shenme le?*
2sg buy what LE

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[2] *Weight*, weight function, here can be understood as a cover term for 10^x in positional numeral system, corresponding to 10^0, 10^1 "-ty", 10^2 "hundred", etc, without their linguistic contents.

[3] No matter whether familiarity is a UG feature, the reference of the Numeral-and-classifier preceded nominal phrase (NumP) in (1b) has not been introduced in the discourse, nor has the reference of the bare NP in (1c). Therefore, if the semantic definition of *definite* has familiarity as a necessary component, this position is not definite.

"What did you buy?"

b. —— *wo mai le* *si jin xianrenzhang*.
1sg buy LE four 1/2kilo cactus
"I bought two kilos of cacti"

c. —— *wo mai le* *xianrenzhang*.
1sg buy LE cactus
"I bought cacti/cactus"

On the other hand, the references of the nominals in (2b, 2c) are known to the speaker; therefore, by definition, this is a position where one finds specific nominals. Ergo, nominals in the answers to (2a) are indefinites specific.

In such a position, we can let the nominal be preceded by a Dem[4], as in (3b, 3c); interestingly however, we have to add a pointing/showing gesture once we add the Dem[5].

(3) a. —— *ni mai shenme le?*
2sg buy what LE
"What did you buy?"

b. —— *wo mai le zhei si jin xianrenzhang*. *(+**pointing**)
1sg buy LE this four 1/2kilo cactus
"I bought these two kilos of cacti"

c. —— *wo mai le* *zhei (ge) xianrenzhang*. *(+pointing)
1sg buy LE this CL cactus
"I bought this cactus"

In other words, in an indefinite specific position, Dem must be licensed by pointing. "Pointing" confirms that the DP is specific indefinite. The speaker must know the reference of the entity to be able to point at its location. The hearer doesn't know the reference, otherwise pointing wouldn't be necessary. Before we add the Dem in the nominal position, the reference of the goods purchased doesn't have to be introduced. With a pronounced Dem, the reference of the nominals has

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[4] Dem *zhei* "this" does denote proximal. In other Chinese dialects, a range of Dem can be used to modify the distance between the item and the speaker/hearer (Lü SX 1990, Mi Q 1986, Ogawa1981, Xuefan (Chen WD) 1938, Zhu JS. 1986, Zhu QY 1988 Wang L 1944-45, Jin H 1988). In Beijing Mandarin, Dem only makes a binary distinction between distal (*nei* "that") and proximal.

[5] *Zhei* cannot carry a contrastive stress under this context.

to be introduced, by pointing. Crucially the reference cannot be introduced by a Dem alone, i.e. without pointing.

The gesture and Dem co-refer. In this sense, Dem shows the property of an anaphoric pronoun, which calls for an antecedent—here, a pointing/showing gesture which introduces the reference—in a certain domain. The Dem cannot locate an object; this is achieved by the actual body movements required by the Dem[6].

2.2 Two proximal Dems and disagreeing CL under NP ellipsis

NP ellipsis is possible if the one who did the shopping doesn't know the name of the stuff (s)he got, or if (s)he doesn't want to speak out what the thing is. Three strategies are possible to introduce the reference under NP ellipsis: a bare demonstrative *zhe* "this" (4a), or *zhe* plus a classifier *ge* (4b) or a different form of proximal demonstrative *zhei* "this" together with a classifier *ge*.

(4) a. —— %?*wo mai le* *zhe*. *+pointing*
1sg buy LE this
"I bought this."

b. —— *wo mai le* *zhe ge*. *+pointing*
1sg buy LE this CL
"I bought this."

c. —— **wo mai le* *zhei*. *+pointing*
1sg buy LE this

d. —— *wo mai le* *zhei ge*. *+pointing*
1sg buy LE this CL
"I bought this."

In all possible cases in (4), the speaker must point to the stuff (s)he bought or show it to the hearer, the same as in the overt NP cases in (3).

The structure that licenses NP ellipsis helps to tell *zhe* "this" and *zhei* "this" apart. The *zhe*, with a tense vowel ɤ, can be used on its own without an overt classifier. The percentage sign represents that some Beijing Mandarin speakers find it preferable to have a following *ge* pronounced for *zhe*. *Zhei*, with a diaphone in its rhyme ɛ(ɪ)—a weakened form of which can be just a lax semi-open vowel in

[6] Lü SX (1956:164) classifies two types of demonstrative usages, one of them needs pointing. For more examples in Mandarin on *dependent substitute* see Wang DY (2005). Grohmann and Panagiotidis (2004) also mentioned that Greek Dem also has the dependent substitute usage (i.e. sometimes requires pointing).

the nuclear—**must** be followed by a classifier *ge*. Even for speakers who find *zhe-ge* preferable than *zhe*, there is a contrast between *zhei-*(ge)* and *zhe-?(ge)*.

We can see the same pattern when the reference of the NP is singular, specified by the preceding bare classifier, the bold faced *ge* in (5).

(5) a. —— *wo mai le* ***ge*** *xianrenzhang*.
1sg buy LE CL cactus
"I bought a cactus."

b. —— *wo mai le* ***ge*** *zhe %?(ge)*.
1sg buy LE CL this (CL)
"I bought this"

c. —— *wo mai le* ***ge*** *zhei *(ge)*.
1sg buy LE CL this CL
"I bought this."

Adding numerals (which may change the semantics from singular *one cactus* to plural *four cacti* in (6)) does not change the requirement for the post-Dem CL:

(6) a. —— *wo mai le* *si /yi ge xianrenzhang*.
1sg buy LE four/one CL cactus
"I bought four cacti/a cactus."

b. —— *wo mai le* *si /yi ge zhe %?(ge)*.
1sg buy LE four/one CL this (CL)
"I bought this/ four of these."

c. —— *wo mai le* *si /yi ge zhei *(ge)*.
1sg buy LE four/one CL this CL
"I bought four of these/this."

(7) a. —— *wo mai le* *si jin zhe*. *+pointing*
1sg buy LE four 1/2kilo this
"I bought two kilos of these"

b. —— *wo mai le* *si jin zhe ge*. *+pointing*
1sg buy LE four 1/2kilo this CL
"I bought two kilos of these."

c. —— **wo mai le* *(si jin) zhei*. *+pointing*

1sg buy LE four 1/2kilo this

d. —— *wo mai le* *si jin zhei ge*. *+pointing*
1sg buy LE four 1/2kilo this CL
"I bought two kilos of these."

Classifiers usually need to agree with the noun. For instance, the classifier for *daxiang* "elephant" is *zhi* (or *tou*), the classifier *ge* is not possible (8); the classifier for *qiang* "gun" is *ba* (or *zhi*), the so-called "default classifier" *ge* is not possible (9).

(8) a. *si /yi zhi daxiang.*
four/one CL elephant
"four elephants/ an elephant"

b. **si /yi ge daxiang.*
four/one CL elephant

(9) a. *si /yi ba/zhi qiang.*
four/one CL gun
"four guns/ a gun"

b. **si /yi ge qiang.*
four/one CL gun

However, for NP ellipsis with a demonstrative, neither classifier has to agree with the noun[7]. In sentence (10c, 10d), the classifier *ge* can be used even when the intended noun *daxiang* "elephant" doesn't take *ge* as a classifier.

(10) a. —— *wo mai le* *si /yi zhi daxiang*.
1sg buy LE four/one CL elephant
"I bought four elephants/an elephant."

[7] Richard Kayne (p.c.) suggests that the disagreement in NP ellipsis on both CLs recalls in part what he suggested about Hopi (and English) in Kayne (2003): "The fact that the irregular plural morphology of *children* doesn"t not carry over:
(116) *They have two seven-year-old-ren. [vs. *two seven-year olds*]"
Agreeing CL is not irregular, the number of nouns that requires obligatory CL-N agreement is so high, that if we wish to carry Kayne's suggestion over to Mandarin, his suggestion that "irregular morphology is associated only with the phonological features of a lexical item" may be (better) understood as: the agreement/selection between two lexical items is licensed by (or directly related to) the step of derivation that licenses NP ellipsis.

b. —— *wo mai le* *si /yi ba qiang*.
1sg buy LE four/one CL gun
"I bought four guns/a gun."

c. —— *wo mai le* *si /yi ge zhe %?(ge)*.
1sg buy LE four/one CL this (CL)
"I bought a this/ four of this." (can be guns or elephants)

d. —— *wo mai le* *si /yi ge zhei *(ge)*.
1sg buy LE four/one CL this (CL)
"I bought a this/ four of this." (can be guns or elephants)

In other words, (10c, 10d) can be used as an equivalent answer to either (10a) or (10b). In the present double-CL condition, the first classifier **doesn't have to** agree with the noun (10c, d); however, it can agree with the unpronounced noun: *ba* agrees with *qiang* "gun"; and *zhi* agrees with *daxiang* "elephant" (11).

(11) a.—— *wo mai le* *si /yi **ba** zhe ?(ge)*. +showing
1sg buy LE four/one CL this (CL)
"I bought a this/ four of this (and showing a gun or four guns)."

b.—— *wo mai le* *si /yi **zhi** zhe ?(ge)*.
1sg buy LE four/one CL this (CL)
"I bought a this/ four of this
(and pointing to an elephant or four elephants)."

a'.—— *wo mai le* *si /yi **ba** zhei *(ge)*.
1sg buy LE four/one CL this (CL)
"I bought a this/ four of this (and showing a gun/ four guns)."

b'.—— *wo mai le* *si /yi **zhi** zhei *(ge)*.
1sg buy LE four/one CL this (CL)
"I bought a this/ four of this
(and pointing to an elephant or four elephants)."

For speakers who find *zhe-ge* preferable to a bare *zhe*, some find, under NP ellipsis, a disagreeing pre-Dem CL is also preferred over an agreeing CL, i.e. disagreeing all the way down; others see no difference between an agreeing pre-Dem CL and a disagreeing pre-Dem CL.

The second classifier is only visible when the noun is covert. Moreover, the second classifier **cannot** agree with the unpronounced noun, it must be *ge*. In other words, regardless of whether the pre-Dem CL agrees (12) or doesn't agree (13) with the noun, an agreeing post-Dem CL is not possible.

(12) a. —— **wo mai le* *si /yi ba zhe ba (qiang)*.
1sg buy LE four/one CL this CL (gun)

b. —— **wo mai le* *si /yi zhi zhe zhi (qiang)*.
1sg buy LE four/one CL this CL (gun)

a'. —— **wo mai le* *si /yi ba zhei ba (qiang)*.
1sg buy LE four/one CL this CL (gun)

b'. —— **wo mai le* *si /yi zhi zhei zhi (qiang)*.
1sg buy LE four/one CL this CL (gun)

(13) a. —— **wo mai le* *si /yi ge zhe ba (qiang)*.
1sg buy LE four/one CL this CL (gun)

b. —— **wo mai le* *si /yi ge zhe zhi (qiang)*.
1sg buy LE four/one CL this CL (gun)

a'. —— **wo mai le* *si /yi ge zhei ba (qiang)*.
1sg buy LE four/one CL this CL (gun)

b'. —— **wo mai le* *si /yi ge zhei zhi (qiang)*.
1sg buy LE four/one CL this CL (gun)

When the *wh* question focuses on the specifier of an NP, i.e. when the NP is pronounced or is known to both the speaker and the hearer in the context, post-Dem CL can agree with the understood noun.

(14) *wo mai le zhei zhang.*
1sg buy LE this CL^{ticket}
"I got this one."

Namely, sentence (13), where the post-Dem has agreed with *piao* "ticket", is an appropriate answer to (15) but it is inappropriate to (16).

(15) a. —— *wo mai le zhang Mama Mia, ni mai shenme le?*

1sg buy LE CL^{ticket} Mama Mia, 2sg buy what LE
"I bought a ticket of *Mama Mia*, what did you get?"

b. —— *Ni mai le shenme piao?*
2sg buy LE what ticket
"What kind of ticket did you get?"

(16) *X is just back from a supermarket, Y asks:*
—— *ni mai shenme le?*
2sg buy what LE
"What did you buy?"

Table I.

	Wh	Wh-spec
Zhei-ge	OK	OK
Zhei-CL$_{agree}$	#	OK
Zhei	*	*
Zhe	%?	%?
Zhe-ge	OK	OK
Zhe-CL$_{agree}$	**	??*
CL$_{agree}$ zhe(i) ge	OK%	OK%
CL$_{agree}$ zhe(i) CL$_{agree}$	*	*
Ge zhe(i) ge	OK	OK

To sum up (as in Table I), under the condition of NP ellipsis, **Num-CL *zhe(i)*** cannot be followed by a classifier that agrees with the understood noun, it can only be followed by the classifier *ge* that is not agreeing with the noun. ***zhe*** can be followed by an optional disagreeing classifier *ge*, ***zhei*** must be followed by an obligatorily disagreeing classifier *ge*.

When there isn't a Num-CL preceding the Dem, some demonstratives can be followed by an agreeing CL, yet *zhe* prefers not to be followed by any agreeing CL. ***zhei*** must be followed by an agreeing CL when the *wh*-focus is on the specifier of NP.

There isn't such a thing as a "basic order" for Dem and Num-CL; whether a Dem can precede a Num-CL or not, depends on the internal structure of the Dem. Demonstratives with different internal structures have different semantics, as shown below, each requires a different derivation.

2.3 Exhaustive *zhe* and the pre-Num *zhei*

Zhe cannot occur in pair-list answer (17b, c).

(17) a. *Tamen mai shenme le?*
They buy what LE?
"What did they buy?"

b. *Tamen mai le zhe*(i) ge, hai you zhe*(i) ge.*
They buy LE this CL, yet have this CL
"They bought this, and this."

c. **Nana mai le zhe, Lala mai le zhe. (+pointing/showing twice)*
Nana buy LE this, Lala buy LE this

d. *Nana mai le zhei ge, Lala mai le zhei ge. +pointing twice*
Nana buy LE this CL, Lala buy LE this CL
"Nana bought this and Lala bought this."

Abels and Murungi (2007) show that a pair-list can be used as a test for exhaustive focus. The semantics is clear: for instance, in (17c, d) neither the thing that *Nana bought* nor Lala's share is the entire amount of things that they bought. Neither share of the theme exhausts the denotation of the stuff being purchased by some of the agents of *mai* "buy".

Meanwhile, from the speaker's point of view, answering with a sentence in (17d) requires pointing (or showing) twice at different references of things. This multi-event of pointing with the intention of distributing over objects creates a semantic distributive object that is not allowed by *zhe*, whose antecedent denotes the entire (collective) entity of the things being pointed at. Whereas no such number agreeing requirement is needed for *zhei*.

I relate the exhaustive meaning to the fact that *zhe* is normally very non-colloquial when preceding an agreeing CLP.

(18) a. *wo xihuan zhe??(i) san duo hua.*
I like this three CL flower
"I like these three flowers."

b. *wo xihuan zhe??(i) duo hua.*
I like this CL flower
"I like this flower."

The CL that can follow *zhe* is the disagreeing *ge*. No numerals can be licensed between the Num-CL-Dem and *ge*, i.e. this post-Dem *ge* cannot license a numeral. It must be sitting in a position different from pre-Dem agreeing CL that can license

a numeral. Dem *zhe* sits in a position that not only blocks the agreement between the CL and the NP, but also blocks the licensing of a Num.

The interpretation of *zhe-ge*, and *zhei-ge*, can be both singular and plural. An agreeing CL or Massifier licenses a numeral. When the numeral is not pronounced, it is interpreted as *yi* "one".

(19) a. *Wo mai le ge/zhi zhe (ge).*
I buy LE CL/CL_{Agree}this (CL)
"I bought this."

b. *Wo mai le ge/zhi zhei* ge.
I buy LE CL/CL_{Agree} this CL
"I bought this."

a'. *Wo mai le zhe (ge).*
I buy LE this (CL)
"I bought this/these (e.g. books)."

b'. *Wo mai le zhei ge.*
I buy LE this CL
"I bought this/these (e.g. books)."

In (19a', b'), the post-Dem disagreeing CL allows the interpretation of the reference to be both singular and plural. Only an agreeing CL, such as *ge/zhi* in (19a, b), controls the interpretation of the numeral information.

Zhei "this" has a much wider usage than *zhe*. It can precede an agreeing CL (20a), it can precede a bare NP and the phrase renders a singular interpretation (20b), and it can precede Num-CL (20c).

(20) *wo mai le____*
I buy LE____
"I bought_____"

a. *zhei zhang chuang*
this CL^{bed} bed
"this bed"

b. *zhei chuang*
this bed
"this bed"
* "these beds"

c. *zhei si zhang chuang*
this four CL^{bed} bed
"these four beds"

The fact that *zhei* can precede a bare NP and lead to singular interpretation, leads to the hypothesis that *zhei* is a phonologically contracted form of a Dem *zhe* and a *yi* "one" (Zhu DX 1982, Lü SX 1985 among others).

Zhu DX (1982) has noticed some syntactic distributional differences between *zhe* and *zhei*. However, an explicit explanation on the relation between *zhe* and *zhei* is still called for.

I propose that the conditions under which the disagreeing CL *ge* can be omitted reveals the (structural) complexity of the Dem. The question now turns to what exactly the structural difference is. There are three phonologically different forms of *yi* "one", each with its own distinct syntax (to be shown in §3). If there is a *yi* "one" in *zhei*, we would need to know which *yi* "one" it is.

To sum up, under NP ellipsis, we can find two classifiers in a specific indefinite nominal: the one preceding Dem doesn't have to agree with the noun, but can; pre-Dem CL can license overt Num or cover *yi* "one" (i.e. when there isn't a Num, the CL-N is interpreted as *yi-CL-N*). The CL that follows Dem must not agree with the noun. The disagreeing classifier doesn't force a singular reading in the way a bare agreeing classifier does, it doesn't specify number information; and it cannot be preceded by any numerals.

In English, *such a book* and *a book like this* have similar meaning. However, *such* in doesn't agree in number with the NP (*such a book* v.s. *such books*); and it precedes "a", a morpheme that often used to denote singularity but also can be found in a plural denoting phrase *many a student*. Whereas demonstratives do show number agreement: *this* cannot precede an NP that shows number agreement (**this books* v.s. *these books*).

The two proximal demonstratives *zhe* and *zhei* have different distributions. *Zhe* cannot precede an agreeing CL (like **this NPs*), whereas *zhei* can.[8] The position of the Dem *zhe* cannot be high (Bruge 2002); because it is not able to precede any agreeing CL or numerals. The position of the Dem *zhei*, on the other hand, cannot be the same as *zhe*. Further derivation needs to be responsible for putting the two overt morphemes *zhe-* "this" and *–i* "one" together. They are not inserted at the same node. In the following section, I will suggest a derivation for *zhe-i* via Merge **and** Move.

3. *yi*^{55} "one", *yi*^{51} "one" and *yi*^{35} "one"

The numeral *yi* "1" has three forms in Northern Mandarin: first tone [55], second tone [35] and fourth tone [51].

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[8] *Such* must be followed by "a" when preceding a bare NP, but demonstrative *zhei* can precede a bare NP. NP ellipsis can strand *such* (*as such*), but *zhei* requires a CL under NP ellipsis. The closer translation for *such* in Mandarin may be *zhe-me* and *na-me*, with a second morpheme also found in *shen-me* "what", which is historically derived from *wu* "thing".

3.1 syntactic differences between *yi*^{51} "one" and *yi*^{35} "one"

Both *yi*^{35} and *yi*^{51} can precede a classifier. With an overt CL and overt NP, the condition on sandhi is determined by the tone of the CL. A CL that takes a fourth tone [51], only licenses *yi*^{35} (21). CLs of other tones license only *yi*^{51} (22).

(21) a. *yi*$^{35/*51}$ *dao*^{51} *xue-hen*
one stripe blood-stain
"a stripe of blood stain"

b. *yi*$^{35/*51}$ *shan*^{51} *chuanghu*
one CL window
"a window"

(22) a. *yi*$^{51/*35}$ *zhang*^{55} *zhuo-zi*
one CL desk-$_{\text{Nominal suffix}}$
"a desk"

b. *yi*$^{51/*35}$ *tai*^{35} *PC*
one CL PC
"a PC (computer)"

c. *yi*$^{51/*35}$ *ba*^{214} *yi-zi*
one CL chair
"a chair"

When *yi* "one" immediately precedes a lexical item which can be interpreted both as a noun or as a CL (or as a Massifier), we can see the difference in the interpretations of the phrase reflected on the tone of *yi* "one".

For instance, when *tong* "bucket" is used as a massifier, the numeral takes the [51] tone, *yi*^{51}; the NP *niunai* "milk" can be pronounced (23a). When *tong* "bucket" is used as a noun, it can be preceded by a bare numeral *yi* "one" (Du YD 1993), and the tone of the numeral *yi* "one" is [35], *yi*^{35} "one" (23b); another NP *niunai* "milk" is then unable to be licensed. As if the English preposition *of* is in *yi*^{51}.

(23) *wo mai le* ___.
I buy LE___

a. *yi*^{51} *tong*^{214} (*niu nai*)
one bucket (cow milk)
"I bought a bucket of milk."

b. *yi*^{35} *tong*^{214} (**niu nai*)
one bucket (*milk)
"I bought a bucket."

The agreeing CL for *tong* "bucket" is *zhi* [55], and it licenses *yi*^{51}, not *yi*^{35}. Let me propose that when we see *yi*^{35} in (23b), there is an unpronounced disagreeing classifier *ge*^{51}. Again, referring it as disagreeing is because it never agrees with the noun.

(24) *yi*^{35} *GE*^{51} *tong*^{214}
one CL bucket
"a bucket"
(Taking the convention of using capital letters to indicate unpronounced morphemes.)

Take another example. The classifier for *chuang* "bed" is *zhang*^{55}. *Yi*^{35} is not possible with an overt agreeing classifier that is not of the fourth [51] tone (25a). *yi*^{51} is not possible without the overt agreeing classifier *zhang* (25b). *Yi*^{51} is only possible with an overt classifier, either an agreeing classifier or a non-agreeing amount denoting word (massifier) *chuang* "bed". When *chuang* "bed" gives an *amount* meaning (25b' and 25c), it functions as an overt agreeing classifier and blocks the licensing of *yi*^{35}.

(25) *wo mai le*___
I buy LE___
"I bought___

a. *yi*$^{51/*35}$ *zhang*^{55} *chuang*
one CL bed
"a bed"

b. *yi*$^{*51/35}$ *chuang*^{35}
one bed
"a bed"

b'. *yi*$^{51/*35}$ *chuang*^{35}
one bed
"a bed-ful (of sth)"

c. *yi*$^{51/*35}$ *chuang*^{35}*hong-zao-r*
one bed red-date-$_{R}$
"a bed-ful of red-dates"

There are two meanings *yi-N* can provide. The meaning of (25b) and (25b') is roughly as follows:

(26) i. 1 bed

ii. something (e.g. dates), the amount of which is as many as "1bed" can contain

To get the meaning in (26i), *yi* "one" must take the [35] tone; and the embedded "1 bed" meaning in (26ii), like any case when *yi* precedes a CL, observes the sandhi rule: [51] *yi* precedes all but [51] CL; [51] CL/Massifier is preceded by only [35] *yi* (27b).

(27) *wo mai le* ___
I buy LE___
"I bought___

a. *yi*$^{51/*35}$ *ke*^{55} *shu*
one CL tree
"a tree"

b. *yi*$^{*51/35}$ *shu*^{51}
one tree
"a tree" or "a tree of"

c. *yi*$^{*51/35}$ *shu*^{51} *(hong-zao-r)*
one tree (red -date-$_R$)
"a tree" or ("a tree of red-dates")

3.2 the *yi*^{35}*-N* conjecture

The NP that follows an anti-sandhi *yi*^{35} "one" doesn't undergo NP ellipsis (28a). A massifier imposes sandhi of *yi* and allows NP ellipsis (28b).

(28) a. *yi*^{35} **(shu*^{51}*/ chuang*^{35}*)*
one tree / bed
"a tree/bed" or "a tree of"

b. *yi*^{35} *shu*^{51} */yi*^{51} *chuang*^{35} *(hong-zao-r)*
one tree / one bed (red -date-$_R$)
"a tree /bed (of red-dates)"

A massifier meaning (embedded amount 26ii) cannot be interpreted from *yi*^{35}*-N*. For instance, a massifier *chuang* "bed" doesn't agree with the noun *hong-zao-r* "red-date", thus (29b) cannot be interpreted as "a bed-ful of dates". *yi*^{35}*-N* can only be interpreted as the N being counted, i.e. with the meaning in (26i).

(29) a. *yi*^{35} *qiang*
one gun
"a gun"
* "a bed of guns"

b. *yi*^{35} *hong-zao-r*
one red-date-$_{R}$
"a red-date"
* "a bed/tree of dates"
agreeing classifiers of *hong-zao-r* "red-date" are *ke*, *li-r* or *ge*

yi^{35}-N is used only when the noun is countable, either a count noun or the countable meaning of a noun.

(30) *nin neng bang wo mai yi*^{35} *{shui*^{214}*/pi*^{35}*jiu} ma?*
2sg can help me buy one {water /beer} QUESTION PARTICLE.
"Could you help me to get a water/beer?"

For mass nouns that don't come already atomized, deleting the CL is not possible.[9]

(31) *nin neng bang wo mai yi*^{35} *niu*^{35}*-rou ma?*
2sg can help me buy one ox-meat QUESTION PARTICLE.
"Could you help me to get some beef?"

* : at the butcher's (where a butcher cuts-and-sells)
OK: portioned beef, such as dishes in restaurant, packages in supermarket.

The sandhi *yi* "one" doesn't impose the [+count] requirement on the noun. Yi$^{35/51}$ can be followed by a massifier-noun, as well as a CL-N or a Measure unit-N. And the anti-sandhi *yi*^{35} requires a more restrictive environment: i.e. it must be followed by a bare atomized noun.

Not only does the null CL after *yi*^{35} not agree with the noun, also it cannot agree with the noun. If a count noun comes into the derivation pre-atomized, it doesn't necessarily require a CL. And a numeral should be able to specify the amount of the atomized NP directly.

---

[9] In dialects of Chinese where *one-N* is not allowed, such as Xiang (Lu Man p.c.), it seems that their Dem also have different distribution.

In counting, the numeral *yi* "one" has the first [55] tone (32a). When being used as a noun, the name of the numeral "1", it still has the first tone (32b).

(32) a. yi^{55} 1

b. ***san ge yi*^{55}** *jia zai yi-qi* *shi 3.*
3 CL 1 add at together be 3
"Adding three one-s together is three."

The CL for all numerals is *ge* (33). I thus propose that the null GE in *yi-N* is the classifier of a null numeral (34).

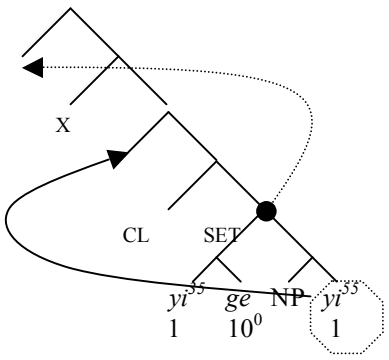
(33) a. ***san ge er*** *jia zai yi-qi* *shi 6.*
3 CL 2 add at together be 6
"Adding three two-s together is six."

b. ***liu ge yi-bai*** *shi duoshao?*
6 CL 1 10^2 be how.much
"How much is six 100 add up to?"

(34) yi^{35} *GE* YI^{55} NP_{count}
{ yi^{55} "one" NP}× 1

The derivation for yi^{35}-*N* is as (35) and (36). The numeral for the weight 10^0 is *ge* (Au-Yeung, WH. 2005). A countable NP comes into a derivation by Merge with an NP yi^{55} (rather than with the agreeing CL).

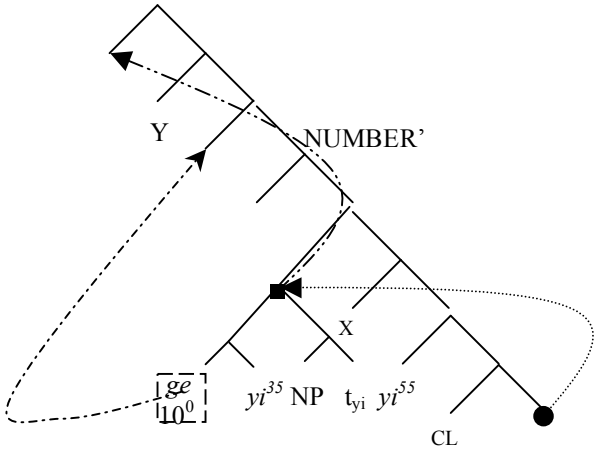
(35)



A digit merges with its weight, and the weight projects. In (35), *yi* "1" is the digit and *ge* "10^0", the tree the two forms is labelled as SET, short for weight and superbases.

NP and yi^{55} are both nouns, the tree they formed is a bare tree (Chomsky 1995). The bigger tree with four terminal nodes merges with a head (CL) that carries number information. The numerical NP daughter of the bare tree, Agree with CL and moves. This step of raising breaks the local symmetry, makes the previously bare tree capable of labelling. I represent the labelling by remnant moving (the arrow with dotted line) the tree to a head (X).

(36)



After the labelling of the mother node of NP and *yi*, the node that consist digit, weight, NP and *yi* "1" cannot be labelled, because both of its daughters are labelled. To decide a winner of the daughters, a third head (NUMBER) is merged and the numeral *ge* "10^0" raised via agree. A second round of remnant movement finishes the labelling of the tree (YP).

Yi^{55} and *ge* Move out in due course, leaving out yi^{35} and NP to raise to spec Y. The Comp of Y will not be pronounced, only the material in spec-of Y will be pronounced (Kayne *to appear* PrinPron).

The derivation of yi^{35} *–N* has two assumptions: (i) principled labelling method and (ii) LCA (Kayne 1994). Crucially different from Cinque (2005), an underlying hierarchical order (such as Dem>>Num>>(A>>)N) is not a primitive in this system.

As we are going to see in the following sections, the yi^{35} *–N* derivation contains the set of operations that is sufficient in deriving massifiers, numbers and colour term adjectives; and capture the selectional/agreeing relationship among phrases.

What's more, the parametrically difference within Dem, Num and adjectives can also be captured within this system.

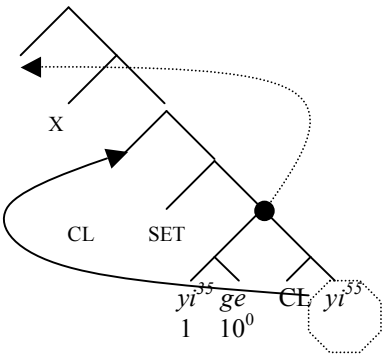
I hereby propose a conjecture of derivation**.**

***yi*^{35} *–N* conjecture:**

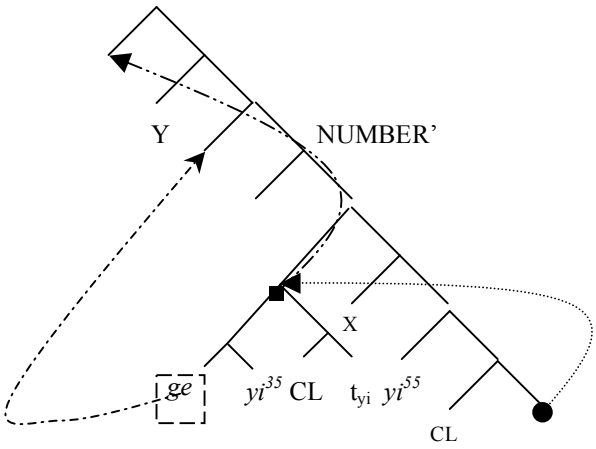
every morpheme, covert or overt, is licensed via (cyclically) applying the derivation of *yi*^{35} *–N*, i.e. the representations in (35-36).

A massifier itself (e.g. the *chuang* "bed" in *yi-chuang* NP "a bed-ful of NP") is derived in the same manner as *yi*^{35}*-N* (illustrated in 37, 38).

(37)



(38)



To sum up, *yi*^{35}*-N* is used only when the N is countable, and the cardinality of the set is "1". Only a singular interpretation is available from *yi*^{35}*-N*. The anti-

sandhi *yi*^{35}is modifying a null disagreeing CL *ge*, also the numeral for the weight 10^0. A massifier in Num-N $_{amount}$-NP, which can license numerals and impose tonal constraints on the numeral *yi* "one", doesn't enter any selectional/agreeing relation with the noun. It is a non-agreeing classifier, because it sits in the position of a weight.

3.3 the weights of some additive numerals

The numeral "1" has [55] tone (39). When *yi* "one" is part of a complex numeral, a weight (e.g. *shi* 10^1) doesn't trigger sandhi of a preceding *yi*^{55} "one" (40).

(39) a. *shi yi*^{55}
10^1 1 "11"

b. *san* *shi* *yi*^{55}
3 10^1 1 "31"

(40) a. *er* *shi yi*^{55} *wan*
[2 10^1 1] 10^4 "21,0000"

b. *si* *shi yi*^{55} *yi*
[4 10^1 1] 10^8 "41,0000,0000"

Numerals larger than 9999, has *wan* 10^4, *yi* 10^8 as the superbase. The weight of the highest digit in a complex numeral (e.g. *bai* "hundred", *qian* "thousand", *wan* 10^4 in (41)), provides the condition for sandhi of *yi* in the way a classifier does. Namely, when 1 directly modifies 10^4, the fourth tone weight *yi*^{51} "10^8" *wan*^{51} "10^4" will licence only *yi*^{35} "1"; and *bai*^{214} "10^2", *qian*^{55} "10^3" licence *yi*^{51} "1". Such phonological rules apply no matter whether the entire numeral phrase is used for counting or as part of a Num-CL phrase.

(41) a. *yi*^{51} *bai*^{214} *(tiao* *yu)*
1 10^2 (CL_{Agree} fish)
"one hundred (fish)"

b. *yi*^{51}*qian*^{55} *(gongjin* *pangxie)*
1 10^3 (kilogram crab)
"one thousand (kg crabs)"

(42) *yi*^{35}*wan*^{51} (*tai* *diannao*)
1 10^4 (CL computer)

"ten thousand (computers)"

In an additive numeral, if it is not the highest weight, a middle field weight will not trigger the sandhi of *yi* (43).

(43) a. ***yi*^{51}** *bai* *yi*$^{55/*51}$ *shi* *yi*^{55}.
1 10^2 1 10 1
"111"

b. *yi*^{51} *qian* ***yi*$^{55/*51}$** *bai* *ling* *yi*^{55}
1 10^3 1 10^2 0 1 "1101"

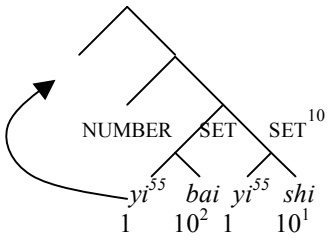
c. *yi*^{35} *wan* *yi*$^{55/?51}$ *qian* ***yi*$^{55/*51}$** *bai* *ling* *yi*^{55}
1 10^4 1 10^3 1 10^2 0 1
"11101"

Jin YJ (1979) takes the non-sandhi between *yi* and CL to be an argument that the complex numeral forms a constituent itself, with *yi* as part of the numeral phrase and then enters into a relation with the CL. For English and Romance numerals, Kayne (*to appear* NumB) argues that numerals are adjectives, which modifies an unpronounced noun NUMBER first, and then merges with the noun. The two analyses are basically the same, and neither is correct.

We can see that in Mandarin, the sandhi of a numeral *yi* "one" in an additive numeral depends on the position that the *yi* modifies. $110=1\times10^2+1\times10^1$ could be considered as having a structure in (44b).

(44) a. *yi*^{51} *bai* *yi*^{55} *shi*
1 hundred 1 ten
"110"

b.



[10] The head SET is also used in Kayne (*to appear* NumBase) which takes some complex numerals to have a SET in their structures. Here, SET means *weight*.

In (44b), the additive numeral move to the spec of NUMBER to close off a NumeralP, the NumeralP then Merge with the phrase that involves CL and N. However, this simple derivation meets difficulties when a numeral is used as a modifier in a nominal. If a numeral enters a derivation as a constituent (44b), it fails to explain the correlation between having an overt CL and having a lower numeral base (45). Table II. lists the pattern of ellipsis in NP.

(45) a. *ni mai le duo-shao (zhi) niao*?
You buy LE how-much (CL) bird
"How much birds did you buy?"

b1. — *wo mai le yi qian san. /yi*^{35} *wan yi*^{55}.
I buy LE 1 10^3 3. / 1 10^4 1
"I bought 1300/11000."

b2. — *wo mai le yi qian san* ***bai*** */yi wan yi* ***qian*** *zhi (niao)*
I buy LE 1 10^3 3 10^2 /1 10^4 1 10^3 **CL** (bird)
"I bought 1300/11000 birds."

b3. — **wo mai le yi qian san /yi wan yi zhi (niao)*
I buy LE 1 10^3 3 /1 10^4 1 **CL** (bird)

Table II.

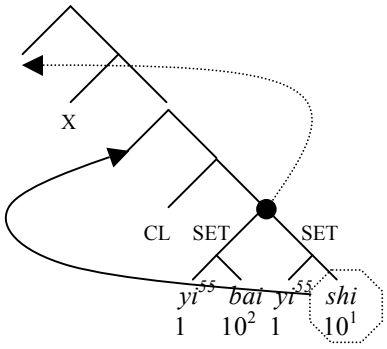
a.	Num-CL-NP	*yi*^{51} *bai* *yi*^{55} ***shi*** *zhi niao* 1 10^2 1 10 CL bird "110 birds"	OK
b.	NP ellipsis: Num-CL (complete Num)	*yi*^{51} *bai* *yi*^{55} ***shi*** *zhi* 1 10^2 1 10 CL "110 birds"	OK
c.	NP, CL ellipsis complete Num	*yi*^{51} *bai* *yi*^{55} ***shi*** 1 10^2 1 10 "110"	*
d.	CL ellipsis complete Num	*yi*^{51} *bai* *yi*^{55} ***shi*** *niao* 1 10^2 1 10 bird	*
e.	NP, CL ellipsis NumBase ellipsis	*yi*^{51} *bai* *yi*^{55} 1 10^2 1 "110"	OK
f.		*yi*^{51} *bai* *yi*^{55} *{zhi/niao/zhi niao}* 1 10^2 1 {CL/bird/CL bird}	*

For an additive numerals between 109 and 10^8, if there isn't any middle field weight specified as 0, such as 2089, 3005, 100050 etc., and there isn't any digit of the weight 10^0; then the lowest non-10^0 weight, be it *qian* "10^3", *bai* "10^2" or *shi* "10^1" can be omitted. This happens under the condition of NP ellipsis, when the CL (including agreeing CL and massifiers) is also omitted (45-b1, Table II-e). If the CL is **not** omitted, this lower numeral base cannot be omitted (45-b3, Table II-f).

The structure I had in (44b) won't be able to explain why the lower weight has to be pronounced when there is a CL. In that derivation, the weight is too deeply embedded to have any effect on the Merge of a numeral with a CL.

The last middle-field weight should be moved up to have interaction with the CL.

(46)

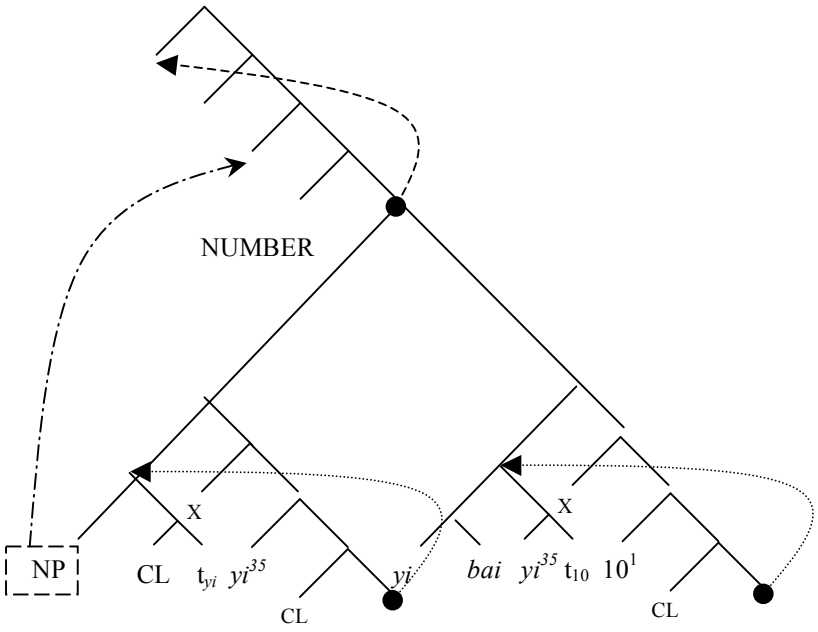


For an additive numeral to form, after each subpart of the numeral is formed, the tree Merges with a CL, which indicates a part-whole relation between 10 and 110. The lower weight (*shi* 10) moves to the spec of CL, to let the syntax / semantics know that this low digit is part of a bigger numeral. And then the remnant moves to the spec of a numeral head, sending the information that now an entire additive number has been created (46).

The NP merges with a CL and then with the structure of an additive numeral, the derivation for Num-CL-N (e.g. 47a) is illustrated in (47b). Because the CL omission and the weight omission are both under the condition of NP ellipsis, I take the NP to be raised first in (47b).

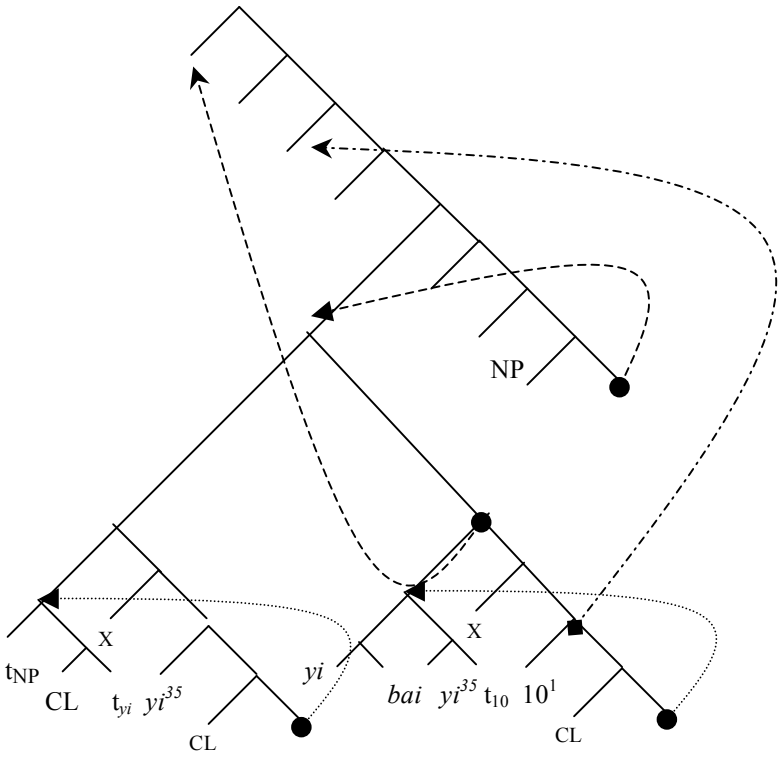
(47) a. *Nana mai le yi bai yi shi zhi yang.*
Nana buy LE 1 10^2 1 10^1 CL sheep
"Nana bought 101 sheep."

b.



Then the phrase containing the position value *shi* "10^1" raises, triggering the movement of the phrase containing the numeral.

c.



Leaving all the traces aside, the word order in (47c) is now Num-final weight-CL-NP. Once NP is moved up to a non-pronouncing position, namely creating the condition for NP ellipsis, the weight 10^1 and the CL can now be open to an operation that deletes them at the same time.

In this derivation, the weight *shi* "10^1" doesn't enter the derivation as a sister to the noun (Ionin and Matushansky (2004a, b); it takes part in the composition of the numeral internal phrases, it is merged with a digit *yi* "1". Neither does the digit have any direct relation with the NP[11].

In §2, we have seen that in NP ellipsis, *zhe* allows omitting the disagreeing classifier. The optionally pronounced disagreeing CL (10^0) *ge*, is derived in a manner similar to the optional middle-field numeral base (47c): insert *zhe* in the

[11] Zweig (2005) suggests the digit first merges with NP. Whereas I take the numeral and CL as a tree that undergoes raising.

numeral's position (the tree containing *yi bai yi* t_{10}), *ge* in the raised weight (10^1) position.

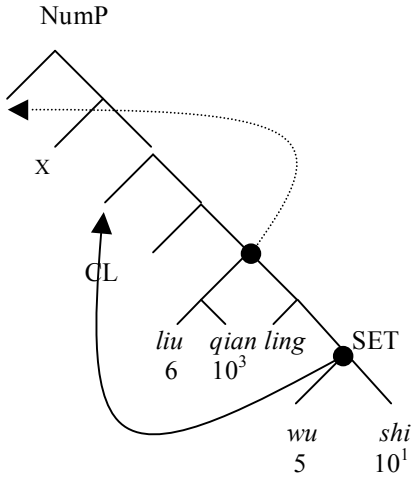
3.4 other additive numerals

With respect to the co-occurrence condition with CL, there are three other types of numerals. Firstly, numerals have empty position(s) (i.e. *ling* "0, and") don't drop their weights and don't like the CL to be omitted (48a). *ling* "0, and" is not a position marker. Because no matter how many empty positions between two weights with specified digits, there is going to be just one *ling* "0, and" (48b).

(48) a. *wo mai le liu qian* ***ling*** *wu shi ?(xiang/ben-r).*
I buy LE 6 10^3 **and** 5 10^1 ? (box /CL^{book})
"I bought six thousand **and** fifty (boxes of) books."

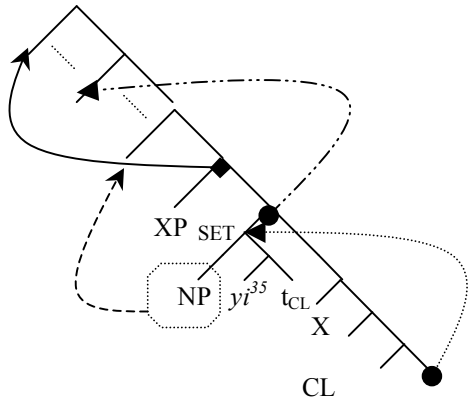
b. *liu wan* ***ling*** *wu*
6 10^4 **and** 5
"60005"

c.



For Mandarin numerals with *ling* "0, and", *ling* "0" is Merged to conjoin the two number phrases *liu-qian* "six thousand" and *wu-shi* "fif-ty" (in English the word *and* is a conjunction, Zweig (2005)). Instead of the weight *shi* "10" raising up, 50 raises up, followed by a remnant movement of [[6000]*ling* t_{50}]. When this X Phrase merges with NP-CL, after NP raising, remnant movement of the [t_{NP} CL] followed by phrasal movement of the [XP $t_{NP\text{-}CL}$]

d.

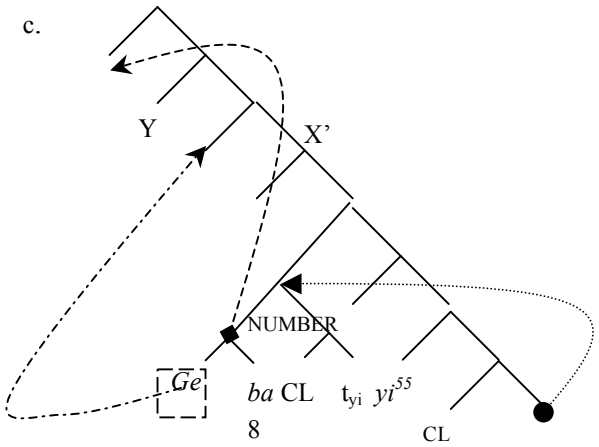


Secondly, numerals with specified 10^0 weight never pronounce its *ge* "10^0", nor do they prefer CL omission (49).

(49) a. *wo mai le yi qian san bai wu shi yi^{55} ??(xiang/ben-r)*
I buy LE 1 10^3 3 10^2 5 10 1 ??(**box /CL^{book}**)
"I bought 1351 (boxes of) books."

b. *wo mai le yi qian san bai wu shi ba ??(xiang/ben-r)*
I buy LE 1 10^3 3 10^2 5 10 8 ??(**box / CL^{book})**
"I bought 1358 (boxes of) books."

This requirement can be captured if the digit of the 10^0 take the weight *ge* that is used in deriving a CL (38) as its weight, directly modifying the *yi* "1"-CL phrases.



In this way, not only can we capture the generalization that numerals under 109 don't allow CL to be deleted (50a, b, c); but also the fact that digit modified weight (e.g. *ban* "half, 0.5", digit 5, the weight 10^{-1}), will follow an agreeing CL if there is a higher weight digit (50d).

(50) a. *wo mai le yi$^{51/*55}$ *(xiang/ben-r)*
I buy LE 1 *(**box /CL^{book}**)
"I bought a (box of) book."

b. *wo mai le ba^{55} *(xiang/ben-r)*
I buy LE 8 *(**box /CL^{book}**)
"I bought eight (boxes of) books."

c. *wo mai le (wu shi) liu *(xiang/ben-r).*
I buy LE 5 10^{1} 6 *(**box /CL^{book}**)
"I bought (fifty) six (boxes of) books."

d. *wo mai le liu *(xiang/ben-r) ban (tonghua shu).*
I buy LE 6 *(**box /CL^{book}**) half (fairytale book)
"I bought six and half (boxes of) fairytales."

The NP is separated from the CL in (50d) is also an argument for merging this type of numerals first with the CL, and then have the Num-CL merge with NP.

3.5 Multiplicative numerals and *zhei*

Multiplicative numerals allow deleting CL (51a), but don't allow deleting of weights. Semantically deleting the only weight (51b) or deleting a super base (51c) is unrecoverable, no matter in what context.

(51) a. *wo mai le liu qian (xiang/ben-r).*
I buy LE 6 10^3 (**box /CL^{book}**)
"I bought six thousand (of books)."

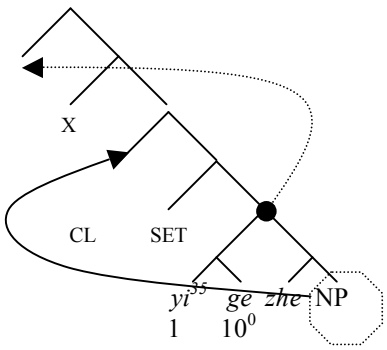
b. *wo mai le liu *(qian).*
I buy LE 6 10^3
"I bought six thousand."

c. *liu qian wu bai *(wan)*
(6 10^3 5 10^2) 10^4
"6500,0000"

Multiplicative numeral doesn't allow weight deletion. Number 4-9 don't allow CL deletion. The post-Dem *ge* after *zhei* also cannot be deleted. It is plausible to take *zhe-i* as a numeral with specified 10^0 weight, if we consider *zhe* 'this' as the higher weight and *–i* 'one' as *yi*^{55}. Then *ge* can be taken as a undeletable CL. It is also plausible to consider the *–i* as the digit in a multiplicative numeral (*yi*$^{35/51}$). Then *ge* is the undeletable weight. However, *ge* doesn't agree with the NP, which make the argument for taking *ge* as weight favourable.

The derivation of Dem *zhei* in a specific indefinite noun with post-Dem disagreeing *ge*, under NP ellipsis, is illustrated in (52, 53).

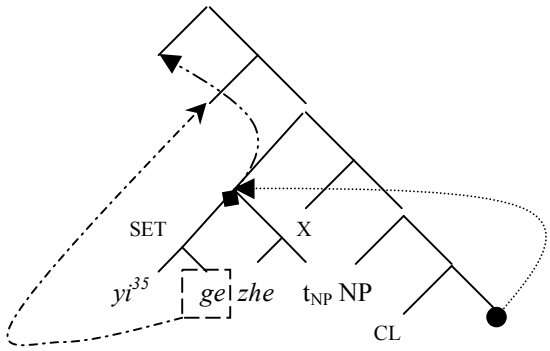
(52)



NP raising is followed by Remnant movement. Move *ge* out to a Head X, Move the tree that contains the trace of *ge*, the trace of NP, *yi*^{55} and *zhe* to the spec of X.

At this step, *zhe* and *yi*^{55} move as one constituent, making it phonologically possible to have a contracted *zhei* "this".

(53)



In this derivation, *zhe* doesn't directly modify any QP, thus it doesn't encode a collective reading.

Different internal structures of numerals have different effects on their external derivations (i.e. the omission of CL and pronouncing of weights). The distribution of *zhe* and *zhe-i* are different also because of their internal structures.

In this section, I presented the syntactic difference among three different *yi* "one". Special attention has been paid to the anti-sandhi numeral *yi* "one" directly preceding a (count) noun: *yi*^{35}*-N*. I suggest that the derivation for a CL/Massifier is parallel to that of *yi*^{35}*-N*.

I argue that different numerals have different structures, their interaction with their weights, CL and NP are all different. Derivation for *zhe-ge* found only in indefinite specific nominals is taken to be parallel to the additive numerals with omittable weight. Demonstrative *zhei* in *zhei-ge* has a derivation parallel to a multiplicative numeral. The derivations of the three different additives and the multiplicatives are instances of cyclic application of *yi*^{35}*-N*.

4. Colour terms

Six different Mandarin lexical items can be translated as *red* in English (54 and 55).

(54)	*di*	*shang*	*you*	*yi*	*liu-r*	____
	floor	up	have	one	CL^{strand}	____

a. ***hong*** *toufa*

red hair

b. ***hong-de*** *toufa*
red -de hair

c. ***hong-se*** ****(de)*** *toufa*
red-colour *(de) hair

d. ***hong*** ***yan-se*** ****(de)*** *toufa*
red colour-colour *(de) hair
"There is a strand of red hair on the floor."

(55) a. *wo xihuan* ***hong *(se).***
I like red *(colour)

b. *wo xihuan* ***hong *(yan-se).***
I like red *(colour-colour)
"I like red."

Different words for *red* have different syntactic behavious.

4.1 *hong* "red" and *hong-se* "red-colour"

The bare *hong* "red" can be an adjective modifying some nouns (54a) (see Zhu (1956) for discussions on selective property of non-predicative adjective[12]). *Hong* "red" is also a noun that selects its own classifiers.

(56) a. *yi mo hong (se)*
one CL red (colour)
"red"

b. *yi pian hong (se)*
one CL[a large area of] red (colour)
"red"

c. *yi dian hong (se)*
one CL[a drop of] red (colour)
"a drop of red"

But the "widely" used *ge*, an individualizer classifier (Cheng and Sybesma 1999), cannot be selected by colour terms (57).

[12] In short, non-predicative adjectives (Lü and Rao 1981) are not suffixed by *de*; and they don't freely combine with just any noun. Which non-predicative adjective goes with which noun has been claimed to be random (Zhu 1956), similar to gender marking in Indo-European languages.

(57) *san ge hong (se)
three CL red (colour)

Hong "red" can precede *se* "colour". *Se* "colour" is not a free morpheme (58a), to become a word, either a colour term or a bound morpheme *yan* "colour, face" is required (58b).

(58) a. *yi zhong se
one type colour

b. yi zhong yan-se
one type colour-colour
"a type of colour"

hong "red" can directly precede certain nouns, it is a noun that can license its own classifier, and it can modify a bound morpheme *se* "colour". In §3, we have seen that numeral yi^{35} "one" can directly precede a noun (59a). Yi^{55} "one" is a noun, it can license its own classifier (must be *ge*) (59b); and some weights are bound morphemes (59c).

(59) a. ***yi*^{35}** mao^{35} niu^{35}
a hair ox/cow
"a yak"

b1. yi^{35} ***ge*** yi^{55}
a CL 1
"a 1"

c1. San ***ge*** yi^{51} bai =300
3 CL one 10^2
"three one hundreds (three multiplies 100)"

c2. *San ***ge*** bai /qian /wan
3 CL 10^2 10^3 10^4

yi^{55} can be an argument on its own (60a). Although a bare colour term X (let X stands for a colour term) shares the property with yi^{55} in being able to select its own classifier, only *X-se* can be a DP (60b).

(60) a. wo de xingyun shuzi shi yi^{55}/*$yi^{51/35}$
1sg DE lucky number be one

"My lucky number is one."

b. *wo de xingyun se shi zi-*(se) / hong-*(se)*
1sg DE lucky colour be purple-*(colour) /red-*(colour)
"My lucky colour is purple/red."

Se "colour" serves the function of turning an NP into a DP. *X-se* selects the same set of colour term classifiers as X does (56). Adjective-*se* compounds describing the shade of colour (61), can license the same set of agreeing classifiers as *X-se*.

(61) a. *yi pian/mo/dian liang *(se)*
one CL bright *(colour)
"bright colour"

b. *yi pian/mo/dian qi *(se)*
one CL exotic *(colour)
"exotic colour"

c. *yi pian/mo/dian ming huang*
one CL bright yellow
"bright colour"

Some colour terms don't have free monomorphemic forms, like *yi*[51] requires a weight. These colour terms have to co-occur with their "colour base" *–se* (62a), and they can't be degree modified (62b).

(62) a. *wo xihuan nei mo/dian/pian zong *(se)*
1sg like that CL brown *(colour)
"I like that brown."

b. ** hen zong -(se)*
very brown (colour)

Colour terms with obligatory *se* "colour" can't be degree modified. Even for basic colour terms, which have free monomorphemic forms, *se* "colour" cannot occur in degree modification (63).

(63) a. *hen hong-(*se) (de)*
very red colour de

"very red"

b. *hong-hong-(*se) de*[13]
red red colour de
"very red"

c. *hong tong-tong (*se) de*
red TONG-TONG colour de
"very red"

I take the ungrammaticality of (64a) to be related to (63), namely, bound colour terms are all modifying an unpronounced *SE* "COLOUR".

(64) a. **zhei tiao qunzi hen zong.*
this CL skirt very brown

b. **zhei tiao qunzi hen zong SE.*
this CL skirt very brown COLOUR

A covert *SE* has the same effect as an overt *se* "colour" in their disallowing of degree modification. The covert *SE* requires the overt *se* "colour", that explains why colour terms that cannot be degree modified are bound.

The derivation of the NP *hong* "red" is as follows:

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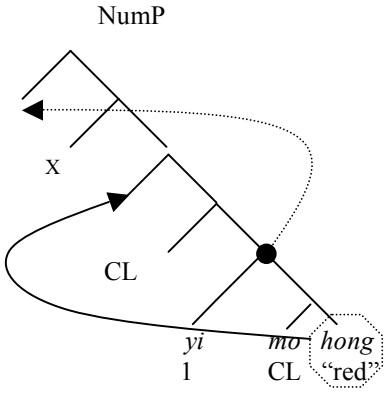
[13] Zhu (1961, 1966,1993) argues that the *de* in [XP-de NP] (i) is a contracted form of an adjectival suffix de_2 "-ly", and a nominalizer de_3 "one".

(i) *bai sheng-sheng de li*
white SHENG-SHENG -ly.one pear
"a white pear"

This analysis is supported by the fact that in another Northern Mandarin dialect (Shanxi: Zhu 1993), the two morphemes for de_2 and de_3 in reduplication (i) are pronounced differently. The nominalizer analysis leads him to claim that in Chinese, the most common modification is using a Noun to modify another Noun, and in major European languages Noun-Noun modification is restricted; that bare adjectives modifying a noun is restricted in Chinese and free in some European languages.

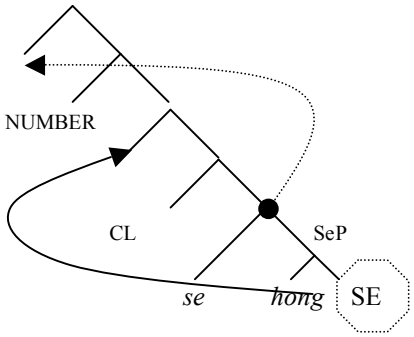
The generalization on the difference between Chinese and other languages is probably too coarse. Why are both bare adjectival modification and Noun modification allowed in one language? Another point that leads to the debate on *de* in the 1960s was that: considering *X-de* as a noun can't capture the intuition that a phrase with deleted noun (*A-de*) doesn't exactly feel like a pronounced full-fledged NP (*A-de-N*). Finally, this analysis can't explain the ungrammaticality of a bare colour term preceding Numeral classifiers phrase.

(65)

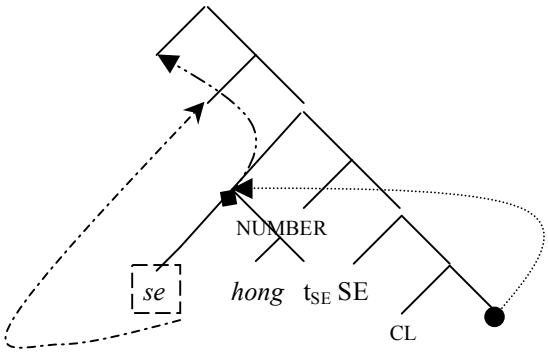


The derivation of the argument DP *hong-se* in "*I like red*" starts with (66) and carries on as *se* "colour" moves up.

(66)



(67)



The raising of *se* "colour" and its following remnant movement makes *hong-se* an argument DP (67).

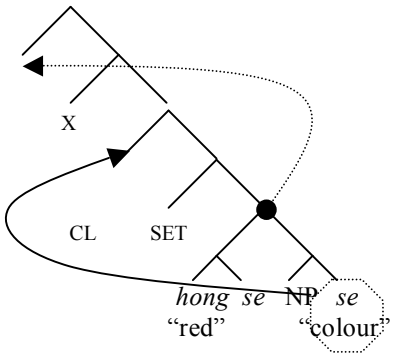
The derivation of non-predicative adjective *hong* "red" should be able to capture the fact that the non-predicative adjective *hong* only directly precedes certain NPs. Namely, there is a selection restriction between the NP and the colour adjective. For instance, *hong* "red" cannot be directly precede the light noun *dongxi* "thing" (68a), nor can any bare colour term; but all free colour terms can precede *shoujuan* "handkerchief" (68b).

(68) a. **hong /huang /lan /bai /hei// zong dongxi*
red /yellow/blue/white /black// brown thing

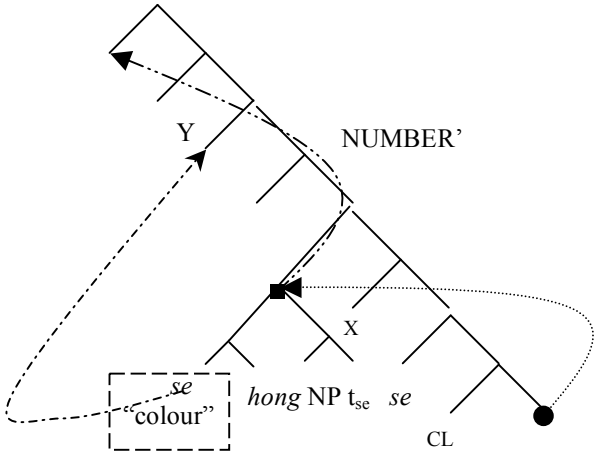
b. *hong /huang /lan /bai /hei// *zong shoujuan*
red /yellow/blue/white /black// *brown handkerchief
"red /yellow/blue/white /black handkerchief(s)"

The selectional property between a non-predicative adjective and its NP recalls the relation between *yi*[35] and count nouns, which serves as an argument for the existence of the null "colour base" *se*. NPs that allow colour adjectives to directly precede them have a null colour base in them. The derivation of *X-NP* is an instance of *yi-N*.

(69)



(70)



To recap, in this section, I have argued that *hong* “red” as an NP should be analogous to *yi*^{55} “one”. And the *hong* “red” in *hong-se* is modifying an unpronounced “colour base”, *SE* “COLOUR”; a property similar to a sandhi *yi*$^{35/51}$ modifying a weight. The overt *se* “colour” is crucial in turning a bare NP colour term into a DP. Non-predicative adjective *hong* “red” in *hong-N* has a derivation that parallel to the anti-sandhi *yi*^{35} in *yi-N*.

4.2 *de*

4.2.1 *de* is obligatory after a colour base

Bound colour terms (those that require *se* "colour") don't precede an NP directly (71)[14].

(71)	a.	**Nana you*	*si*	*tiao*	*zong*	*- se*	*maoyi.*
		Nana have	four	CL	brown	colour	sweater
	b.	**Nana you*	*si*	*tiao*	*hui*	*- se*	*maoyi.*
		Nana have	four	CL	grey	colour	sweater
	c.	**Nana you*	*si*	*tiao*	*fen*	*hong*	*maoyi.*
		Nana have	four	CL	pink	red	sweater

An additional morpheme *de* is required[15].

---

[14] Free colour terms often acquire a figurative meaning with the morpheme *se* "colour". For instance, *huang-se* "yellow" can be a non-predicative adjective, having the interpretation of *erotic*, directly precedes a noun (i-a), but it cannot precede a Num-CL (i-b) (for recent discussions, see Sio 2006).

(i) a. *san ben* *huang-se* *xiaoshuo*
3 CL^{book} yellow-colour novel
"three erotic novels"

b. * *huang-se* *(nei) san ben* *xiaoshuo*
yellow-colour (that) 3 CL^{book} novel

An additional morpheme *de* is required to modify a Num-CL.

(ii) *huang-se* *de* *?(nei)* *san ben* *xiaoshuo*
yellow-colour DE that 3 CL^{book} novel
"those three erotic novels"

X-se-de also can be an argument and the condition is the same as on *X-de*.

(iii) *Nana xihuan* *huang-se* *de*.
Nana like yellow-colour DE
"Nana likes {the erotic one(s) / erotic things}."

[15] And it is not just Chinese needs a morpheme to license an overt *colour*. In Hungarian, when *-szìn* "colour" is pronounced, an extra morpheme -ű is required for an adjective use (i). (Dèkàny Èva p.c.)

(i) *Var egy szàl* *vörös (szìn-ű)* *haj az asztal-om-on*
be one strand scarlet (colour-U) hair the table-my-on
"There is a strand of scarlet hair on my table."

The analysis for *de* in attributive adjectives is by no means just a "subordinator" as argued in Paul (2005). Nor do her (as well as works therein cited) crucial data stand: *de*-less AN as being compound which is then different from reduced relative A *de* N. The crucial example is that: for some adjectives, it seems that they can stand without a copula.

(ii) *Zhangsan zhen congming* (Paul 2005 (3))
Zhangsan really intelligent
"Zhangsan is really intelligent."

(72) a. *Nana you si tiao zong se de maoyi.*
Nana have four CL brown colour DE sweater
"Nana has four brown sweaters."

b. *Nana you si tiao hui se de maoyi.*
Nana have four CL grey colour DE sweater
"Nana has four grey sweaters."

c. *Nana you si tiao fen hong se de maoyi.*
Nana have four CL pink red colour DE sweater
"Nana has four pink sweaters."

One attempt for *de* would be the *linker* analysis as in den Dikken and Singhaspreecha (2004), further developed in den Dikken (2006). In Mandarin, we can find *de* functioning sometimes as a linker (Predicate-linker-Argument) and some times as a relator (Argument-relator-Predicate).

(73) a. *hen hong*
very red

b. *hong de hen* (relator)
red DE very
"very red"

c. *hong fangzi*
red house

d. *hong de fangzi* (linker)
red DE house
"red house"

It doesn't help much to claim that a word as a linker and relator. However, *de* forces us to investigate into the structure of the phrases it links.

4.2.2 *de* and CL

However, the sentence stands only due to the fact that there is a degree adverb *zhen* "really". Without this degree adverb, it is not a possible sentence unless used as an answer to "*who is more intelligent, Zhangsan or someone else*?" And this is the same property as that of attributive adjectives.

Recall that when the anti-sandhi numeral *yi*^{35} "1" must be followed by a countable NP without an intervening CL[16]. *de* cannot intervene between a colour noun and its CL. (74) shows that colour adjectives can only modify a colour adjective without *de*.

(74) a. *yi mo zi (*de) hong*
one CL purple (*de) red
"red tinged with purple"

b. *yi mo lan (*de) lü*
one CL blue (*de) green
"bluish green"

c. *yi mo hui (*de) bai*
one CL gray (*de) white
"greyish-white"

When a bare NP modifies colour terms, it cannot be followed by a *de* either (75). However, *de* doesn't block the agreement between a non-colour term NP and its CL (76).

(75) a. *yi mo zhuan (*de) hong*
one CL brick (*de) red
"brick-red"

b. *yi mo tian (*de) lan*
one CL sky (*de) blue
"sky-blue"

c. *yi mo xue (*de) bai*
one CL snow (*de) white
"snow-white"

(76) a. *yi kuai hong (de) zhuan*
one CL red (de) brick

---

[16] The anti-sandhi *yi* cannot be followed by a weight, nor can the colour base *se* "colour" intervene (i).

(i) **yi mo lan / huang /hui se (de) lü*
one CL blue/yellow/ grey colour (de) green

"a red brick"

b. *yi pian lan (de) tian*
one CL blue (de) sky
"a blue sky"

c. *yi dui bai (de) xue*
one CL white (de) snow
"a pile of white snow"

A CL must not follow the anti-sandhi *yi*^{35}, and *de* must not follow a colour classifier.

Another similarity between an agreeing CL and *de* is that both block the selection between NP and its modifier. When a colour adjective directly precedes an NP, there is also a selectional relation on the NP. However, when there is a CL between the numeral and the noun, there is no restriction on the CL-NP any more. When *de* occurs, *X-de* is allowed to modify any NP (Zhu 1956).

(77) *hong de dongxi.*
Red DE thing
"red things"

Thirdly, an agreeing CL makes NP ellipsis possible when there is a simple numeral (78b). *De* makes NP ellipsis possible where there is an adjective[17].

---

[17] NP ellipsis can take place as long as there is a "*de*".

(i) a. *Nana xihuan hong *(de)*
Nana like red de
"Nana like the red one."

b. *Nana xihuan hong se *(de)*
Nana like red colour de
"Nana like the red one."

c. *Nana xihuan hen hong de*
Nana like very red de
"Nana like the very red one."

(ii) a. *Nana xihuan zhei pen-r hong *(de)*
Nana like this CL^{pot} red de
"Nana like the red flower."

b. *Nana xihuan zhei pen-r hong se *(de)*
Nana like this CL^{pot} red colour de
"Nana like the red flower."

c. *Nana xihuan zhei pen-r hen hong de*
Nana like this CL^{pot} very red de

(78) a. *Ta mai le hong de.*
3sg buy LE red DE
"He bought the red one(s)."

b. *Ta mai le si duo.*
3sg buy LE four CL[flower]
"He bought four."

Fourthly, as we have seen in §2, an agreeing CL (but not the disagreeing *ge*) can answer a D-linked *wh*-question. *X-de* is good in an answer to a D-linked *wh*-phrase (79a), infelicitous to a *shenme* "what" question[18]. The sentence in (78), for instance, is not a suitable answer to (79b).

(79) a. *Nana xihuan shenme yang de?*
Nana like what kind DE
"What kind does Nana like?"

b. *Nana xihuan shenme?*
Nana like what
"What does Nana like?"

As we have seen in the numeral system, different numerals have different derivational history w.r.t. the interaction between Num-CL-N. If *de* is parallel to a CL, there are several kinds of "numerals" preceding it: adjective *hong* "red", the noun *hong* "red" and the DP *hong-se* "red-colour". Each should render a different derivation.

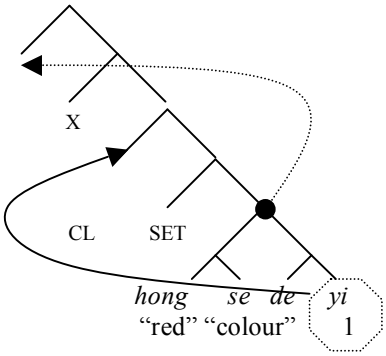
The derivation for the adjective *hong de* in *hong de hua* "red flower" starts as (81), where *de* is modifying a *yi* "1". This is because *X-de* can precede a DemP (80). Since there is a *yi* "1" in the derivation of the Dem *zhei* "this" (as well as *nei* "that"), I consider that *de* is merged with a numeral *yi* "1". Again the derivation has the same pattern as *yi-N*.

(80) *zhuo shang fang zhe* ***hong de ??****(zhei/ nei)* *si tiao* *qunzi.*
table on put ASP **red** DE (this/ that) four CL dress
'There are the four REd dresses on the table.'

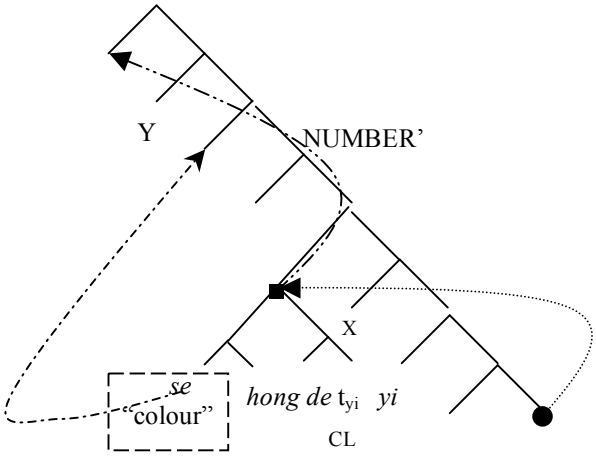
"Nana like the very red flower."

[18] Same as the condition for Dem-CL, the context shouldn't be strong enough to help recovering the NP.

(81)



(82)



The difference between *hong* and *hong-de* has been described (Jakhontov 1959, Chao 1968) as *hong-de* gives more force to *hong* “red”. Zhu (1956) claims with an overt NP, *hong* “red” is subcategorizing the *type of hair*, and *hong de* “red” is describing the *hair*.

That colour terms cannot be preceded by a *de*-Phrase can be linked to the fact that colour terms can never be directly preceded by *yi*^{35}. If I am on the right track in taking the NP that allows *yi*^{35}*-N* in having a covert *GE* (an individualizer in Cheng and Sybesma 1999), then colour terms don’t have modify such a morpheme. Colour adjectives in Mandarin modify a colour base *SE* “COLOUR”, but colour nouns never spell out a CL.

Mandarin colour adjectives don't spell out the weight *GE*, because they cannot enter *yi*^{35}*-N* construction, i.e. they are not count nouns. They do, however, spell out a colour base *SE*.

To sum up this section, colour terms are modifying a colour base *se* "colour", which is a weight in the adjective domain. *De* is merged under the same principle as lexical words.

5. Conclusion

Both *zhe* and *zhei* are generally considered to be proximal demonstratives. *Yi*^{55}, *yi*$^{35/51}$ and *yi*^{35} all share the meaning of the numeral "one". Numerals, whether 1400 or 4, are considered to be of one category. *Hong-(de)* "red" and *zong-de* "brown" are both colour adjectives. However, these encyclopaedic synonyms have different syntax.

The derivation of a lexical item and the derivation of a phrase containing the lexical item interweave. Each morpheme needs to be licensed in the syntax. The debate on demonstratives being licensed high or low can result in both sides being right. They may both be right for the Dem they are discussing have different internal structures across languages. This is just like the language-internal parameter that affects the two Mandarin demonstratives: the difference in morphological complexity between *zhe* and *zhei*, determines whether the demonstrative in question can precede a Num or not. It is not the case that as long as you are a Dem you can then precede Num. A phrase can precede a Num if and only if it is derived in such a way that allows it to enter a derivation that finally leads to a higher-than-Num position. The 'basic word order' is determined by the structural complexity of each lexical item; there isn't such a primitive like 'basic order' in syntax.

The difference between a lexical item (e.g. *hong* "red") and a functional element (e.g. *de*) is not categorical, in terms of their licensing.

For all the data discussed in the present paper, the *yi-N* conjecture holds.

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