The syntactic structure of noun phrases

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10 The Syntactic Structure of Noun Phrases

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This chapter focuses on the structure of the noun phrase. After laying out what different forms the nominal phrase can take and what their interpretational properties are, we investigate issues related to modification and the nature of the classifier. After this, we discuss proposals in the literature on the structure of the noun phrase, discussing issues related to number as well as to the question of whether the Chinese noun phrase involves a DP or not. Our discussion will draw on data from both Mandarin and Cantonese.[1]

1 Constituents and constituent order

In Chinese languages, the noun phrase may, in addition to the head N itself, contain the following elements: a demonstrative, a numeral, a classifier, and one or more modifiers. In a phrase with all these elements, the unmarked base order is as given in (1), illustrated in Cantonese in (2):[2]

(1) Dem Nume Cl Mod (DE) N

(2) li^{1} saam^{1} bun^{2} hou^{2} peng^{4} ge^{3} syu^{1} (Cantonese)
DEM.PROX three CL very cheap DE book
"these three very cheap books"

Demonstratives invariably precede the numeral, the classifier and the N, the numeral always precedes the classifier, and the classifier always precedes the N.[3] Modifiers are generally separated from the noun by what we may call a "modification marker," *de* in Mandarin, *ge*^{3} in Cantonese (both glossed as "DE" here), which we will discuss further below. Besides the order in (1), we find (3), with the

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modifier preceding the demonstrative and/or the numeral. The meaning is not entirely the same as in the unmarked order.[4]

(3) Mod (DE) (Dem) Nume Cl N

Noun phrases do not have to involve all the elements in (1), of course. N may appear bare, or it may be preceded by just the classifier. In Mandarin, the distribution of such [Cl N] phrases is limited and restricted qua interpretation (and there are good reasons to assume that a covert numeral is present),[5] but in Cantonese (and some other varieties of Chinese), [Cl N] phrases are very common, without a covert numeral having to be assumed, as we will see below. Also, in Cantonese, some modifiers (possessors and relative clauses, for instance) can directly precede the classifier (that is, with nothing intervening: no demonstrative, numeral, or modification marker), something which is impossible in Mandarin (see examples (19b,c) below).

Demonstratives can, but do not have to be, followed by a numeral. In Cantonese, they must always be followed by a classifier. In (spoken) Mandarin this is not the case, as is illustrated in (4) and (5) (see also Tang 2007), the equivalent of which would be ungrammatical even in spoken Cantonese.[6]

(4) a. zhè shì nǐ-de ma?
this be 2s-DE Q.PRT
"Is this yours?"
b. nà méi-yìsi
that not.have-meaning
"That is not interesting."

(5) zhè shū bù guì
this book not expensive
"This book is not expensive." (cf. e.g., Wang 2005).

Significantly, the sentence in (5) has one more reading besides the one given here: "These books are not expensive," with a plural interpretation of the subject. We return to this point below.

Furthermore, Tao (2006) discusses cases in Mandarin (previously discussed in Dù 1993 and Jìng 1995) with a numeral, but without a classifier, such as (6) (from Dù):

(6) mǎlù-shang lái-le yí tuōlājī
road-top come-PERF one tractor
"On the road came a tractor."

Tao argues that the presence of a covert classifier is reflected in the tone of the numeral. While the citation tone of *yi* "one" is high level, before rising tones it features a falling tone; and before the level, falling, and dipping tones, its tone

becomes a rising tone.[7] The rising tone which is realized on *yí* in (6), unexpected if one considers the surface data only, can easily be explained if one assumes, as Tao does, that *yī* "one" is, or in any case originally was, followed by the classifier *ge*, which has a falling tone (despite it being so weak that it is generally not marked in transcription). Perhaps due to frequency effects, the sound of the classifier itself eroded, but the sandhi effects lasted. Note that this phenomenon has not been observed for classifiers other than *ge*.[8] We are not aware of similar phenomena in Cantonese.

Finally, N itself may also be missing from the phrase. As was observed by Arsenijevic and Sio (2007) for Cantonese, we find noun ellipsis licensed in two environments: following the modification marker DE and following the classifier (see also Shi and Li 2002; A. Li 2007; and Saito *et al*. 2008). Here are some Mandarin examples.

(7) a. tā gāngcái chī-le yī-ge píngguǒ, nǐ yě yīnggāi
3s just.now eat-PERF one-CL apple, 2s also ought
chī yī-ge
eat one-CL
"He just ate an apple, you should also eat one."

b. tā bù xǐhuān nèi-běn shū, tā xǐhuān zhèi-běn
3s NEG like that-CL book, 3s like this-CL
"He does not like that book, he likes this one."

(8) a. wǒ xǐhuān hóng-sè de xié, tā xǐhuān huáng-sè de
1s like red-color DE shoe, 3s like yellow-color DE
"I like red shoes, he likes yellow ones."

b. tā zuótiān mǎi-le yī-jiàn xīn de máoyī, wǒ
3s yesterday buy-PERF one-CL new DE sweater, 1s
mǎi-le yī-jiàn jiù de
buy-PERF one-CL old DE
"He bought a new sweater yesterday, I bought an old one."

Generalizing, but leaving noun ellipsis cases and modifiers (including possessors and relative clauses) aside (to which we return in Section 4), the noun phrase in Chinese languages can have the following forms:

(9) a. [Dem (Nume) Cl N]
incl. [Dem N] (Mandarin)

b. [Nume Cl N]
incl. Mandarin [Cl N], which is [$ø_{one}$ Cl N] (see fn. 6)
also incl. [*yi* $ø_{ge}$ N] (Mandarin)

c. [Cl N] (Cantonese)

d. [N]

Under the DP hypothesis, the structure that has often been used to represent (9a) is (10) (basically the structure in Tang 1990a).

(10) $[_{DP}$ Dem $[_{NumeralP}$ Nume $[_{ClP}$ Cl $[_{NP}$ N]]]]

The discussions on the structure of the noun phrase in Chinese in the literature often center around the questions of whether there should be a DP layer (there is no article in Chinese so why should there be a D?) and whether demonstratives should be projected as D^0. With some exceptions (such as the work by Benjamin Au Yeung, Andrew Simpson, and Joanna Sio), the discussions generally only take account of Mandarin and not of other varieties of Chinese, which often differ in several respects (as we have seen).

Aside from settling these issues, a structural account of the Chinese noun phrase has to accommodate all the different forms in (9), account for interpretational properties of these forms, as well as facts regarding modification (with and without *de*), to say the least. Below, we first examine the interpretational properties of the different forms in (9). Then we proceed to examine the structure, starting from the lower part of the functional domain in (10), the classifier layer. We will then discuss issues related to number and the DP layer.

2 Interpretational properties

Noun phrases can be interpreted in different ways. They can be definite, indefinite (in two different ways: specific and non-specific), generic and non-referential (or weak-referential). How do languages such as Mandarin and Cantonese, which lack definite and indefinite articles, express these notions? In this section we match the interpretational options with the different forms we listed in (9). As it turns out, these two languages differ in two respects in dealing with this problem.

Let us look at Mandarin first and start with definiteness. Both the demonstrative forms in (9a) and the bare N in (9d) can be used to refer to entities that have previously been introduced into the conversational space and are known to both hearer and speaker, with, in the case of (9a), the distal demonstrative being used more generally than the proximal. It is occasionally suggested that the distal demonstrative plus Cl, *nà* + Cl, or *nèi* + Cl, is developing into a definite article. Naturally, besides referring to entities known to both hearer and speaker, forms with demonstratives are also used in contexts in which they are accompanied by pointing gestures.

There are reasons to think that bare N is the purer definite form of the two (Sybesma and Sio 2008). These reasons have to do with the choice between the two forms in three different contexts. One is in the reference to unique objects, such as the Sun and the Queen, where the use of bare N is much more natural than the use of a form with a demonstrative (to some native speakers consulted, the latter form is not even acceptable).[9] The second context is the following. If there are a book and a journal on the table and someone says "the book is mine," the preferred Mandarin rendering is (11a), with the bare noun, rather than (11b), with a demonstrative and a classifier.[10]

(11) a. shū shì wǒ-de
book be 1s-DE
"The book/the books is/are mine."
b. nèi/zhèi běn shū shì wǒ-de
that/this CL book be 1s-DE
"This/that book is mine."

Third, as a reviewer once helpfully pointed out to us, another test is to see whether forms with a demonstrative and those with bare Ns behave the same in "X boy is tall and X boy is not tall." In English, if X is a demonstrative, the sentence does not necessarily lead to a contradiction (i.e., *that boy is tall and that boy is not tall*), while if X = *the*, we necessarily have a contradiction. In Mandarin, demonstrative forms do not lead to a contradiction, while bare Ns do ([Dem N], without the classifier, seems to have a status somewhere in between; see note 10):

(12) a. nèi ge nánháir hěn gāo, nèi ge nánháir bu gāo
that CL boy very tall that CL boy not tall
"That boy is tall, and that boy is not tall."
b. #nánháir hěn gāo, nánháir bù gāo
boy very tall boy not tall
"The boy is tall, and the boy is not tall."

All these cases suggest that in Mandarin bare N is the "purer" definite form. Furthermore, bare nouns are also used for kinds:

(13) shīzi hěn kuài jiù huì juézhǒng (Mandarin)
lion very quick then will be.extinct
"Lions will be extinct very soon."

Turning to indefinites, we observe that the forms in (9b), with a (c)overt numeral are always indefinite. Bare N can also be used to express indefiniteness. All these forms can be non-specific indefinite and only the forms with an overt numeral can be specific indefinite (Cheng and Sybesma 1999); (14a–c) illustrate the fact that Cl-N combinations can be used for non-specific indefinites but not for specific indefinites.

(14) a. wǒ xiǎng kàn běn shū (CL-N: non-specific indefinite)
I would.like read CL book
"I would like to read a book."
b. wǒ hē-wán-le *(yī)-wǎn tāng (NUM-CL-N: specific
I drink-finish-PERF one-bowl$_{CL}$ soup indefinite)
"I finished a bowl of soup."

c. wǒ jiāo-guò *(yī)-ge-xuéshēng hěn cōngmíng
I teach-EXP one-CL-student very intelligent
(NUM-CL-N: spec. indef.)
"I once taught a student who was very intelligent."

It has also been claimed that *yí* $ø_{CL}$, *yī ge*, as well as $ø_{\text{"one"}}$ *ge* are developing into indefinite articles (e.g., Chen 2003; Tao 2006).

Finally, it seems that only bare N can have a weak or non-referential interpretation. Nouns are non-referential if they do not set up a referential frame (De Swart and Zwarts 2009). An example in English is: *John plays the piano. #It is a very old one.* This second sentence is anomalous because *the piano* in the first sentence is non-referential in the sense defined. The Mandarin rendering of this sentence is as follows, and the effect is the same:

(15) John huì tán gāngqín. #shì ge hěn jiù de.
John can play piano, be CL very old DE
"John plays the piano. #It is a very old one."

To summarize, we see that in Mandarin, forms with a demonstrative can be used in some contexts that require a form with definite reference; that forms without the demonstrative but with a numeral and classifier are all indefinite; and that bare Ns can be definite, indefinite, non-referential as well as kind-referring.

Turning to Cantonese, we see a picture which is different on two counts only, and both are related to the Cl-N combinations: (i) the expression of what we referred to above as "pure definiteness," and (ii) what can be used to refer to kinds. First, for "pure definiteness," where Mandarin uses bare N for this purpose, Cantonese uses [Cl N] phrases.[11] Thus, (16a) is the Cantonese translation of (11a), and (16b) shows the use of the classifier with unique objects ((16b) adapted from Matthews and Yip 1994: 198).

(16) a. bun^2/di^1 syu^1 hai^6 ngo^5-ge^3
CL^{SG}/CL^{PL} book be 1S-DE
"The book/the books is/are mine."
b. di^1 wan^4 ze^1-zyu^6 go^3 taai^{3}yoeng^4
CL^{PL} cloud block-CONT CL sun
"The clouds are blocking out the sunlight."

When applied to Cantonese, the test in (12) confirms that pure definiteness is expressed by [Cl N] in Cantonese, and not by [Dem Cl N] or bare N (bare N is never definite in Hong Kong Cantonese).[12] Second, in Mandarin, reference to kinds are restricted to bare N (as shown in (13)), but in Cantonese, if the plural classifier *di*^{1} is used (see below, (19)), it is possible to use the Cl-N phrase to denote kinds as well (besides bare Ns), as shown in (17). See Au Yeung (1996) for extensive discussion of *di*^{1}.

(17) di[1] sai[1]gwaa[1] zau[6] faai[3] zyut[6]zung[2] laa[3]
CL[PL] watermelon FOC soon extinct SFP
(adapted from Au Yeung 1996)
"Watermelons will become extinct soon."

Other than that, the picture is the same as in Mandarin: forms with a demonstrative can be used in some contexts that require a form with definite reference; forms without the demonstrative but with a numeral and a classifier are invariably indefinite. [Cl N] phrases can be indefinite as well (besides definite) and bare Ns are indefinite (non-specific), non-referential, as well as kind-referring.

In Section 9, we will discuss in detail various proposals to account for the form-interpretation correspondence structurally. However, it is necessary to consider a few other issues first.

3 Modification

Modifiers are generally separated from the noun by DE (*de* in Mandarin, *ge*[3] in Cantonese), regardless of what the nature of the modifier is (possessor, relative clause, locative, etc.). Here are some Mandarin examples (taken from Cheng and Sybesma 2009, where the full range can be found). Note that the translation given is not always the only one possible, especially regarding number and definiteness: (18d), for instance, can also mean "a/the person who never bought a book."

(18) a. dà (de) yú – simple adjective
big DE fish
"big fish"
b. fēicháng dà de yú – complex adjective
extraordinarily big DE fish
"extraordinarily big fish"
c. Zhāng Sān de yīfú – possessor
Zhang San DE clothes
"Zhang San's clothes"
d. méi mǎi-guò shū de rén – relative clause
NEG buy-EXP book DE person
"people who have never bought a book"

The picture presented by Cantonese is very similar; in fact, as we mentioned above, Cantonese is different from Mandarin only in allowing some modifiers to immediately precede the classifier. The sentence in (18d), for instance, has the following three renderings in Cantonese:

(19) a. mou[2] maai[6]-gwo[3] syu[1] ge[3] jan[4]
NEG buy-EXP book DE person
"people who have never bought a book"
OR: "a person who has never bought a book"

b. mou^{2} maai^{6}-gwo^{3} syu^{1} go^{3} jan^{4}
NEG buy-EXP book CL person
"the person who has never bought a book"
c. mou^{2} maai^{6}-gwo^{3} syu^{1} di^{1} jan^{4}
NEG buy-EXP book CL^{PL} person
"people who have never bought a book"

The sentence in (19a) is the most direct translation of (18d) in that it uses the Cantonese counterpart of *de*. Like (18d), (19a) is unspecified for number. When we use a classifier instead of the modification marker, as in (19b,c) (a structure that is impossible in Mandarin), we no longer are number neutral, a point to which we return below.

For the purposes of this chapter, two things related to modification are important. First, in all examples in (18), except one (18a) (the only example that combines two heads), *de* is obligatory.[13] Note, however, that in (18a), *de* is not truly optional because omission or insertion correlates with a change in meaning. Consider the following minimal pairs:

(20) a. dà yú
big fish
"big fish"
a.′ cōngmíng rén
intelligent person
"intelligent person"
b. dà de yú
big DE fish
"big fish"
b.′ cōngmíng de rén
intelligent DE person
"intelligent person"

In Paul's (2005) terms, the adjectives in (20a) (without *de*) describe a "defining property" whereas the ones in (20b) describe an "accessory property." Thus, with *dà yú* "big fish" we have a fish that is naturally big, like a prototypical shark, whereas with *dà de yú* [big DE fish] we describe a fish that happens to be big, like a big herring. Under this view, adjectives with or without *de* modify at a different structural level. It may not be a coincidence that we only find this when we combine two heads.

Besides having the *de* accompanied modifier immediately preceding a bare noun, there are other distributional patterns as well. In Mandarin, a *de* accompanied modifier can appear in between a classifier and a noun, as well as preceding the demonstrative-numeral-classifier sequence (with the demonstrative being optional).[14]

(21) a. (nà) sān-běn Zhāng Sān de shū
that three-CL Zhang San DE book
b. Zhāng Sān de (nà) sān-běn shū
Zhang San DE that three-CL book

In the case of (21b), if the demonstrative is present, *de* is optional.[15] In Cantonese, aside from patterns such as (21a,b), some modifiers can appear right before the

classifier; but in such cases, the counterpart of *de*, *ge*^{3}, cannot be present, as shown in (22a,b) (examples from Cheng and Sybesma 2009).

(22) a. zoeng^1 saam^1 (*ge^3) gin^6 saam^1
Zoeng Saam DE CL clothes
"Zoeng Saam's piece of clothing"
b. keoi^5 ceong^3 go^1 (*ge^3) baa^2 seng^1
3S sing song DE CL voice
"the voice with which he sings"

The second relevant issue we need to address is the question as to how to analyse DE: what is its structural status? Over the years, many different analyses have been proposed. The general consensus is that it is a head, but proposals differ as to what type of head it should be: C^0 (Cheng 1986), D^0 (Simpson 1998, 2001, 2003), Mod^0 (Rubin 2003; Paul 2005), Conjunction^0 (A. Li 2007) (see also Paris 1979 and S. Huang 2006); see Tang (2007) for a critique of treating *de* as a D^0, and Paul (2005) for arguments against treating all *de*-modifiers as relative clauses.

Below we discuss the idea, put forth in Arsenijovic and Sio (2007) and Cheng and Sybesma (2009), that DE may be a kind of classifier, for reasons that will become apparent soon.

4 The classifier

4.1 Count and mass

The fact that one cannot count in Chinese without the intervention of a classifier has inspired many researchers to claim that Chinese nouns are all mass nouns (or are all kind-referring), and that the classifier has the function of turning some of them into count nouns (Borer 2005; Chierchia 1998; X. Li 2011). This claim is questionable for two reasons.[16]

First, there is the difference, noted by Croft (1994) (and referred to in Chapter 3), between measure expressions and sortal classifiers, with the former *creating* a unit of counting/measuring which is not related to any unit in the semantic denotation of the noun it co-occurs with, and the latter simply *naming* the unit that is already present in the semantic denotation of the noun in question.[17] Stating that sortals name a unit that is already there in the semantic denotation of the noun, presumes that there are nouns with such units in their semantic denotation, a type of noun we would like to call "count noun."

Second, Cheng *et al*. (2008) observe that bare nouns in Mandarin (and the same applies to Cantonese) do not easily get the mass interpretation that is expected if all nouns are mass and are only turned into count by the classifier. Whereas, in English, bare nouns can easily shift to a mass reading, as in (23a) and (24a) (adopted from the paper mentioned), we rarely get such a reading in Chinese.

(23) After the explosion,
a. There was dog all over the wall.
b. qiáng-shàng quán shì gǒu-*(ròu)
wall-top all be dog-flesh

(24) a. He likes to eat elephant.
b. tā xǐhuān chī dàxiàng-*(ròu).
3s like eat elephant-flesh

In both (23b) and (24b) we see that on its own the bare noun *gǒu* "dog" cannot be interpreted as a mass; we need to add the noun *ròu* "flesh, meat" to get the intended meaning.

A third argument, relevant for Mandarin only, is that, as we have seen, bare nouns can have definite reference, which means that they can refer to single entities (or pluralities thereof) without the help of a classifier.

4.2 Number

An additional aspect of classifiers that needs to be mentioned relates to number. We saw in (5) (and (18) and (19)) that an N not accompanied by a classifier is unspecified for number; (25a) is another example of a bare N. Note that underspecification for number is different from being "non-referential" as defined above, in which case no referential frame is set up: in these cases (such as (25)) there is one, it is just the case that a similar form can be used for singular and plural reference. Depending on the context, *shū* "book" in (25) can contain a reference to a single book, or a plurality of books:

(25) a. wǒ bǎ shū huán gěi tā le
1s BA book return to 3s SFP
"I returned the book(s) to her."
b. zhè shū bù hǎo-kàn.
this book not good-to.read
"This book is/these books are not good."

When we add a classifier to (25b), the number ambiguity disappears:

(26) zhè běn shū bù hǎo-kàn
this CL book not good-to.read
ONLY: "This book is not good."

Although this may be ascribed to a covert numeral "one" between the demonstrative and the classifier, we know from the Cantonese examples in (19) that the classifier alone signals singularity. In the context of (19), we introduced the element which we may call a plural classifier, di^1, which yields an exclusively plural interpretation (see Au Yeung 1996, 2007 for parallels between di^1 and typical Cantonese classifiers). The counterpart of di^1 in Mandarin is *xiē*:

(27) zhè xiē shū bù hǎo-kàn (Mandarin)
li^{1} di^{1} syu^{1} m^{4} hou^{2}-tai^{2} (Cantonese)
this CL^{PL} book not good-to.read
ONLY: "These books are not good."

The elements *xie* and *di*^{1} can co-occur with demonstratives and the numeral *yī* (see Iljic 1994 for arguments that *xiē* is not a classifier in Mandarin). With *yī* it is translatable as "some" or "a few":

(28) Zhāng Sān mǎi-le yī-xiē shū (Mandarin)
Zoeng^{1} Saam^{1} maai^{6}-zo^{2} jat^{1}-di^{1} syu^{1} (Cantonese)
Zhang San buy-PERF one- CL^{PL} book
"Zhang San bought a few books."

In Cantonese, *di*^{1} can, like other classifiers, precede N without being preceded by a numeral or a demonstrative. As we saw in (19b,c), the classifier *go*^{3} denotes singularity, *di*^{1} plurality.[18]

4.3 Functions: Mandarin vs. Cantonese

In Chinese, the classifier has a grammatical function as well as a more lexical aspect. The grammar tells us that we have to use a classifier in certain contexts, the lexical aspect is relevant in choosing the most appropriate one; it is related to why they are called "classifier" or, somewhat pleonastically, "sortal classifier" in the first place. There are quite a number of different classifiers, each of which is used for a group of nouns that fall into the same category from one perspective or another, classification primarily being based on criteria formulated in reference to shape and function; see Chapter 3. As Chapter 3 also mentions, the fact that the use of a classifier is grammatically required in certain contexts is clear even in children's language. As Erbaugh (2002) has shown, children acquire the use of the classifier very early. In the beginning, they only have one, "general" *ge*; even with words that do not go with *ge* in adult Mandarin, children use *ge*. The same is true for some aphasic patients (Ahrens 1994; Tzeng *et al*. 1991): they often fall back on *ge* when they lack access to the right classifier. In other words, these patients, like children, rather make a lexical mistake than a grammatical one.

What exactly is the grammatical function of the classifier? In both Cantonese and Mandarin, the use of a classifier is required when counting. However, it should also be clear by now that the classifier functions differently in Cantonese and Mandarin. In Section 2 above, we saw that in Mandarin, definiteness is expressed by bare N, while in Cantonese [Cl N] is used for this purpose. Discussing this, as well as other differences between Mandarin and Cantonese in the use of the classifier, Sybesma (2007) concludes that whenever individuality is at stake, the use of the classifier is obligatory in Cantonese, while this is not the case in Mandarin. This is not only clear with definite noun phrases, but also with specific indefinites. The sentences in (29a,b) (based on Shi 1996) present examples with

specific indefinites. We see that in Mandarin, a bare noun can be used, while in Cantonese a [Cl-N] is the only option.

(29) a. gaan^{1} uk^{1} ge^{3} uk^{1}-deng^{2} cap^{3}-zyu^{6} *(zi^{1}) kei^{4} (Cantonese)
CL house DE roof stick-CONT CL flag
"On the roof of the house a flag was stuck."

b. nèi-jiān fángzi de wūdǐng-shàng chā-zhe (yī-miàn) qízi (Mandarin)
that-CL house DE roof-top stick-CONT one-CL flag
"On the roof of the house a flag was stuck."

In short, whereas in Cantonese the use of the classifier is obligatory when individuality is at stake, Mandarin can do with bare nouns in such cases.[19] Apparently, as we already saw in Section 5.1, in Mandarin, the noun does not need the classifier to refer to individual instantiations of whatever it refers to. Looking at Mandarin, we see that we only use a classifier if there is a numeral. Otherwise, we don't need it. This means that, in Mandarin, the classifier is only there for counting, while in Cantonese we need it for individual reference.

5 The structural position of the classifier

Taking the difference in function between Mandarin and Cantonese classifiers as a starting point, Sybesma (2007) argues that the difference indicates that two completely different notions are involved, which can be reflected in assuming two different functional projections. Considering both to be classifier projections, one playing the role of marking individuality or unit-hood ("unit-marking," i.e., what the Cantonese classifier does), the other facilitating counting (i.e., what the Mandarin classifier does – "count-marking"), we can postulate two classifier projections below the NumeralP instead of one, as we did in (10), ClP-u and ClP-c ("u" short for "unit-marking," "c" for "count-marking"):

(30) . . .. [$_{\text{NumeP}}$ Nume [$_{\text{ClP-c}}$ Cl-c (c-marking) [$_{\text{ClP-u}}$ Cl-u (u-marking) [$_{\text{NP}}$ N]]]]

Rothstein (2010) provides arguments for the idea that count-marking and unit-marking are not one and the same thing. On the one hand, she argues, there are cases in which we have semantic access to the individual units, without being able to count them. For example, in the sentence *The big furniture must be put upstairs*, uttered as an instruction to the movers, *furniture* is not a kind-referring element (as it would be in *The big furniture is on the second floor* as a notice in a furniture store), as it refers to "those pieces of my furniture that are big." But despite the fact that the units are there such that we can modify them with *big*, we cannot directly get to them when counting. On the other hand, as Rothstein points out, pure measures enable us to count, without there being any individual units, which is clear in expressions such as: *for this skirt, you need two yards of fine silk* and *now*

we need to add two liters of lukewarm water. So, in the one case we have units, but we still need a count-marker when we count, in the other we have count-markers, but no units.

We observe this effect in Cantonese as well. Genuine measure expressions, such as *sing*[1] "liter," never appear without a numeral, unlike sortal classifiers (see (31)). Measure expressions such as *bui*[1] "cup" are interesting because they are ambiguous between the genuine measure reading (*in the interest of one's health, one must drink one glass of water before breakfast*) and an individualizable container reading (*bring a glass of wine to the gentleman at table 105, please, Harry*), and only in the latter is (31b) acceptable.

(31) a. *sing[1] soei[2] (Cantonese)
liter water
b. bui[1] zau[2]
cup wine

Having two classifier projections may at a first glance seem superfluous, as we typically only see one. However, the claim that there may be two turns out to be supported both empirically and theoretically (quite apart from in Rothstein's considerations just mentioned). In the literature on the nominal domain (of languages other than Chinese), several authors have argued, on conceptual, theoretical, and empirical grounds, that the nominal domain contains at least two functional projections that are related to the referential properties of the phrase; see Szabolcsi (1994), Hoekstra and Hyams (1996), Campbell (1996), and Brugè (2002) to just mention a few (for summary and discussion, see Sybesma and Sio 2008). We discuss Szabolcsi (1994) below, in Section 9. The upshot of these papers is that of these two projections, one is assumed to be low in the structure, generally right above the lexical NP, the other one is the outermost projection of the phrase. We could see the function of the lower one as constituting the first step towards turning the descriptive lexical noun into a referential entity, in semantic terms, by taking a predicate and returning a property. This fits perfectly with the fact that the classifier is used in Cantonese in all contexts in which individuality is at stake. In Sybesma (2009) the ClP-u projection in (30) is associated with the lower FP in the studies just mentioned.

Empirically, in other classifier languages, a noun phrase can contain two classifiers. The example in (32) illustrates this for Thai: the classifier *tua* appears first between the noun and the adjective, and again immediately following the numeral (data taken from Cheng and Sybesma (2009)).

(32) maa tua yai song tua (Thai)
dog CL big two CL
"two big dogs"

What do the classifiers in this phrase do? Let us first look at the classifier between the noun and the adjective. The presence versus absence of the classifier yields a

difference in interpretation. Consider the examples in (33) and (34) (based on Kookiattikoon 2001; verified with several informants).

(33) a. som wan (Thai)
orange sweet
"sweet oranges" (as a type of orange)
b. som *(luk) yai
orange CL big
"big orange(s): orange(s) that happen(s) to be big"

In (33a), the adjective *wan* "sweet" modifies the quality of the fruit, whereas (33b) shows that if we want to modify the size of individual oranges we need to use the classifier. Here is another Thai example:

(34) a. sat yai (Thai)
animal big
"big animals" (type of animal: elephants, buffaloes, rhinoceroses, etc.)
b. sat tua yai
animal CL big
"animals that happen to be big" (e.g., a dog that is big for a dog)

The contrast between (34a) and (34b) is, of course, reminiscent of the contrast we have seen earlier, in the discussion of adjectival modification in Chinese in (20) (adjectives with and without *de*): without *de*, the adjective yields a defining property, while with *de* it gives us an accessory property. Cheng and Sybesma (2009) suggest that if we take "defining" modification as modifying the type, and "accessory" modification as modifying instantiations of the type, the *tua* between *maa* "dog" and *yai* "big" in (32) can be understood as the classifier associated with individuality or unit-hood, that is, Cl-u, just like the Cantonese classifier. Modifying the type, then, is done at the lexical level, whereas modifying the instantiation of the type is done at the functional level, particularly at the level of ClP-u.

What (32) further shows is that when we count, we need to add another *tua*, the one following *song* "two." This reminds us of the Mandarin classifier, which is obligatory when the numeral is present, Cl-c in terms of (30). The question that arises is why counting (i.e., using a numeral) requires the presence of Cl-c?

For Chinese, we have observed that Cl-N in Cantonese and bare N in Mandarin are essentially the same with respect to interpretational and distributional properties. They differ on two counts: Cl-N is singular and bare N is unspecified for number; and when you start counting, you can just add a numeral to Cl-N in Cantonese whereas in Mandarin, you need to add a classifier as well. These two differences can easily be connected if we follow Sybesma (2009) in assuming that numerals can only be combined with nouns that are marked for number.[20] In Cantonese, Cl-N is already marked for number so numerals can be directly added to it. In Mandarin, however, bare N is not marked for number, and needs to be marked for number first before the numeral

can be added to it. This is what Cl-c does.[21] This is the only function the classifier has in Mandarin.

6 *De* and its identity

Cheng and Sybesma (2009) suggest that *de*, being comparable to the classifier in Thai which appears with "accessory" modification, is also a Cl-u. After all, as we have just seen, if modification with *de* is modification of the unit (or entity) that instantiates the type and it is the function of ClP-u, as the first functional projection above the lexical NP, to mark out this unit, *de* can be viewed as occupying the Cl-u head position. Completely parallel to the Thai sentence in (32), we can also find Chinese sentences with both classifier slots filled, the only difference being that it is not the same element used twice (but see note 31).[22]

(35)	sān	běn	hěn	hǎo-kàn	de	shū	(Mandarin)
	saam^{1}	bun^{2}	hou^{2}	hou^{2}-tai^{2}	ge^{3}	syu^{1}	(Cantonese)
	three	CL-C	very	good-read	CL-U	book	
	"three very nice books"						

As indicated in the glosses, a classifier occupies the Cl-c position, whereas *de* and *ge*^{3} are in Cl-u.

Interestingly, in Thai, in contexts where the Cl-u occurs, one may instead find the general modification marker *thîi* being used, which is an element very similar to *de*. As such, the noun phrase in (32) has the following counterpart:[23]

(36)	maa	thîi	yai	song	tua	(Thai)
	dog	CL-u	big	two	CL-c	
	"two big dogs"					

For Lao, which is genetically related to Thai, Enfield (2007) states that it has "two types of classifiers: numeral classifiers and modifier classifiers." Most numeral classifiers can also function as modifier classifiers, but there are also two elements that are exclusively used as modifier classifiers. In other words, the functional interrelationship between classifiers and modification markers is not uncommon. In the Sinitic world, we see that in Southern Min, the modification marker and the most common classifier have the same form.[24]

What *de* is and what kind of projection it projects has been a central issue in the study of noun phrases in Chinese, and the proposal outlined just now that *de* is a classifier, particularly Cl-u, is just the last in a long series of proposals, some of which were mentioned in Section 4. Here we would like to introduce an influential proposal, put forth by Simpson (1998, 2001, 2003), that treats *de* as a D^{0}. Citing its diachronic source (*zhī*, a demonstrative), Simpson treats *de*-modification essentially as relativization à la Kayne (1994) (cf. Cheng 1986, treating *de* as a C^{0}). The structure underlying (37a) under Simpson's analysis is given in (37b), in

which, after the head noun moves to SpecCP, the remnant IP moves to the specifier of the DP which is headed by *de*.

(37) a. wǒ zuótiān mǎi de nèi běn shū
I yesterday buy DE that CL book
"the book that I bought yesterday"
b. [[$_{IP}$ wǒ zuótiān mǎi t_i] de [$_{XP}$ [nèi běn] X^0 [$_{CP}$ shū$_i$ C^0 [t_{IP}]

Tang (2007) examines the environments which license *de*-modification, and concludes that *de* cannot be a D^0. Her main point has to do with the flexibility of the position of *de*-accompanied modifiers. As shown above in (21)–(22), modifiers (including relative clauses) can be pre-demonstrative or immediately pre-nominal. Under Simpson's analysis, the different surface orders entail that the XP hosting the demonstrative-classifier sequence must dominate the DP, which leads to the question of where the demonstrative (or the classifier, for that matter) is positioned.

Taking *de* (and *ge*[3]) as classifiers, heading a projection in the functional domain of the NP, one must assume that the modifiers themselves are in the specificier of this projection. This would then also apply to relative clauses. A consequence of this is that they must be derived without involving head movement, as was argued by Aoun and Li (1993). The fact that modifiers with *de* can appear in different places in the sentence, a problem for Simpson's analysis according to Tang, is also a problem for the idea that *de* is a classifier.

7 NumeralP and NumberP

As we saw in Section 5.2, bare nouns in Chinese are unspecified for number, and phrases containing a classifier or *xie* (Mandarin) or *di*[1] (Cantonese) do have number. This suggests that there is a close association between classifiers and number. One of the issues discussed in the literature is whether, given the association between classifiers and number, Chinese needs a separate Number projection in the functional domain above NP? A related question is where the numeral is: does it head its own projection, or does it occupy the specifier of a projection headed by something else?[25]

In some of the works that explicitly discuss these issues, such as A. Li (1999), we see a structure very similar to Tang's (1990a) structure given in (10) except that the NumeralP has been replaced by a NumberP (NumP).

(38) [$_{DP}$ [$_{NumP}$ [$_{ClP}$ Cl [$_{NP}$ N]]]]

In this structure, the numeral appears in the specifier position of NumP, the head of which is generally left empty. Yang (2005) also postulates a NumP and a ClP, the head of one of which is always empty: if Num is realized by *xiē*, Cl^0 is empty, and when Cl^0 is occupied by a classifier, Num^0 is empty. Au Yeung (2001) argues

explicitly against the postulation of a NumP in Chinese, associating number with the ClP. One of his arguments is related to the facts we observed above, especially clear in Cantonese, that the nature of the classifier determines the number of the phrase. Another argument is based on the complementary distribution of plural/collective marker *men*, in Mandarin, and classifiers.[26] Both being related to number, we can generate them both in the same position, thus explaining the complementary distribution. A similar argument has been presented by Fassi Fehri and Vinet (2004) (who call *men* a "groupifier"). Au Yeung additionally develops a number of arguments in favor of putting the numeral in the specifier position, rather than in the head, of a projection. One of these is that if numerals were heads, one would expect that they could be stranded, an expectation that is not borne out. This is the structure Au Yeung adopts:

(39) $[_{ClP}$ Nume $[_{Cl}$ Cl $[_{NP}$ N]]]]

Hsieh (2008), acknowledging the close relation between number and classifiers, adopts a similar structure, but her labels are different:

(40) $[_{\#P}$ Nume $[_{\#}$ Cl $[_{NP}$ N]]]]

Note that her #P is headed by the classifier. Hsieh allows for several layers in the #P, so as to allow for phrases like *zhè jǐ ge* N/DEM several CL N/ "these several N." The demonstrative would be in the highest specifier position (as would elements such as *rènhé* "any" and *měi* "each") and *jǐ* "several" is placed in the second highest specifier position, as would numerals.

It can be concluded that the classifier and the grammatical notion number are intimately related. It seems unnecessary to postulate two projections, one for number and one for the classifier which is related to number. Only one is needed. What it is called, "ClP" or "NumP," seems to be of secondary importance. It also seems good to adopt the idea, promoted in Au Yeung (2001), that the numeral is in the Spec of this projection, rather than generating its own projection.

8 D or no D

One of the most controversial issues concerning the structure of the noun phrase in Chinese is whether or not there is a DP projection: "DP" may be universal, but Chinese does not have a counterpart of articles. Based on Longobardi (1994), many consider NP to denote a predicate; a DP projection on top of the NP is necessary in order to make the noun phrase referring. Most authors posit (at least) a functional projection on top of the NP for this purpose. For Cheng and Sybesma (1999) and Au Yeung (2001, 2005), the ClP plays such a role, while for others, like A. Li (1998) and Simpson (2005), a DP is necessary.[27] In this section, we review this issue.

One of the core functions/features of D is identified to be the expression of definiteness. This is mainly due to the fact that the definite article in languages

like English is hosted in D^0. Cheng and Sybesma (1999) propose that the classifier layer is actually responsible for the definiteness (see Au Yeung 2005 for a detailed discussion of this issue). In particular, they propose that in both Cantonese and Mandarin, definite noun phrases (Cl-N sequences in Cantonese, bare nouns in Mandarin) have the representation in (41a). Indefinites have the representation in (41b), with the NumeralP on top of the ClP.

(41) a. Definite: $[_{ClP}\ Cl^0\ [_{NP}\ N^0\ ]]$
b. Indefinite: $[_{NumeralP}\ Nume^0\ [_{ClP}\ Cl^0\ [_{NP}\ N^0\ ]]]$

In the case of Mandarin definite bare nouns, the N undergoes movement to Cl to fill the Cl position, while in Cantonese the classifier naturally fills this position.

The status of demonstrative is, however, left unresolved in their paper. In the case of indefinite noun phrases (bare Ns, [Cl-N] phrases or [Nume-Cl-N] phrases alike), the NumeP-layer in (41b) has the effect of undoing the definiteness of the ClP.

Simpson (2005) put forth a proposal that involves three layers. His proposal is based on an extensive cross-linguistic investigation into the expression of definiteness in relation to the occurrence of bare classifiers. He investigated Vietnamese, Hmong, and Nung, which are similar to Cantonese in featuring [Cl-N] phrases with definite reference. Simpson proposes a structure which is headed by a D and, when D^0 or SpecDP are filled, the phrase is definite. Thus, if SpecDP is occupied by a demonstrative or if the Cl-head moves to D^0, a definite interpretation results.[28] Crucially, when there is a numeral, Cl-head movement to D^0 is blocked. If in such cases, no demonstrative occupies SpecDP, we get an indefinite reading. As far as we can tell, Simpson (2005) does not assume that the numeral-head moves to D^0 to trigger an indefinite reading, from which we conclude that D^0 is inherently definite. In other words, the representations for definite and indefinite noun phrases for Simpson (2005) are (42): (42a) is always definite, and (42b) is definite when SpecDP is occupied by Dem, and indefinite when neither SpecDP not D^0 is filled.

(42) a. Definite: $[_{DP}\ D^0\ [_{ClP}\ Cl^0\ [_{NP}\ N^0\ ]]]$
(In)definite: $[_{DP}\ D^0\ [_{NumeralP}\ Nume^0\ [_{ClP}\ Cl^0\ [_{NP}\ N^0\ ]]]]$

Sio (2006) argues that there is evidence for an additional functional layer on top of NumeralP or ClP, independent of the position of the demonstrative (see also Sybesma and Sio 2008). In Cantonese, she argues, a possessor marked with *ge*^{3} can appear above the Dem-Cl-NP sequence, or above NP, but not above Cl-NP:

(43) a. zoeng^{3}saam^1 ge^3 laang^{1}saam^1 (Cantonese)
Zoeng Saam DE sweater
"Zoeng Saam's sweater(s)"
b.* zoeng^{3}saam^1 ge^3 gin^6 laang^{1}saam^1
Zoeng Saam DE CL sweater
Intended: "Zoeng Saam's sweater"

c. zoeng^{3}saam^{1} ge^{3} go^{2} gin^{6} laang^{1}saam^{1}
Zoeng Saam DE that CL sweater
"that sweater of Zoeng Saam's" (=Sybesma and Sio 2008 (15a–c))

Assuming that the possessor marked with *ge*^{3} is an adjoined phrase, Sio argues, and if it were the case that demonstratives are in SpecClP, it would be rather unclear why (43b) is ungrammatical while (43c) is grammatical. Sio concludes that there is an additional FP above the NumeralP, which she calls SpecificityP ("SP"), to which the possessor is adjoined.[29] This is the analysis Sio (2006) proposes:

(44) a. Definite: $[_{SP}\ S^0\ [_{ClP}\ Cl^0\ [_{NP}\ N^0\ ]]]$
b. (In)definite: $[_{SP}\ S^0\ [_{NumeralP}\ Nume^0\ [_{ClP}\ Cl^0\ [_{NP}\ N^0\ ]]]]$

Ignoring the labeling, Simpson's analysis and Sio's can both be represented as in (45):

(45) a. Definite: $[_{FP}\ F^0\ [_{ClP}\ Cl^0\ [_{NP}\ N^0\ ]]]$
b. (In)definite: $[_{FP}\ F^0\ [_{NumeralP}\ Nume^0\ [_{ClP}\ Cl^0\ [_{NP}\ N^0\ ]]]]$

The superficial similarities notwithstanding, the role Sio has in mind for the top FP ("SpecificityP") is very different from the one assigned to it ("DP") in Simpson's analysis. Sio's proposal goes back to the role of the higher D in Hungarian in Szabolcsi (1994). As we briefly mentioned above, Szabolcsi (1994) posits two D-type projections in the noun phrase, mainly due to the fact that two D-type elements can co-occur in Hungarian. The first one, heading the topmost FP in the phrase, is the article; it is either *a(z)* "the" or Ø "a, some" and Szabolcsi labels it "D." The second one is realized by any of a list of quantificational elements such as *minden* "every," *kevés* "few," and *semelyik* "neither" or the demonstratives *e*, *eme*, *ezen* "this," *ama*, *azon* "that." This second type of D is labeled "Det" by Szabolcsi. Szabolcsi argues that D (the article) is a "subordinator", just like C: they "enable the clause and the noun phrase to act as arguments" (p. 214 (80b)). It is mainly a grammatical function. On the other hand, DetP determines the quantification and the definiteness of the noun phrase. The form realized by the D head (definite/strong *a(z)* or indefinite/weak Ø) is determined by a "concord-like process" (i.e., agreement) with DetP.

There is also a similarity between Simpson's representations in (42) and the ones in Cheng and Sybesma given in (41). In Simpson's analysis, both structures are topped by a D-projection, which is absent in (41). But note that in both analyses, the NumeralP is crucial in getting indefiniteness, leading to an inactive D-projection in Simpson's case (if there is no Dem in SpecDP). The only difference is the place where definiteness is encoded. In Simpson's approach it is associated exclusively with D, in (41) it is associated with Cl. The latter approach is compatible with Szabolcsi's idea, incorporated in Sio's analysis, that the referential properties of the noun phrase as a whole are not determined by the outer layer, but only reflected there. More specifically, Sio argues that F^0 in FP (SpecificityP)

agrees with either the Numeral-head [-def] or the Classifier-head [+def] for [±definiteness]. In particular, the F^0 has an uninterpretable [def] feature, which it can check off upon agreeing with an interpretable [±def] feature (with Numeral-head having a [–def] value while the classifier-head has a [+def] value).

Abstracting away from how the nodes are labeled, based on these proposals, the structure of the noun phrase in Chinese can be represented as in (46):

(46) $[_{FP3[+specific]}\ F3^0\ [_{FP2[+indef]}\ F2^0\ [_{FP1[+def]}\ F1^0\ [_{NP}\ N^0\ ]]]]$

As to the labeling of the FPs in this structure, one could, following Sybesma (2007), label FP1 as "ClP-u" (cf. (30) above). This projection marks out the unit that will be the object of the reference for the phrase as a whole. This is also the phrase where definiteness is encoded. FP2 could then be labeled as "ClP-c." It makes sense to incorporate Au Yeung's (2005) proposal and host the NumeralP in the SpecFP2 (see also Hsieh's structure above). The presence of the NumeralP in SpecFP2 yields an indefinite noun phrase. Finally, FP3 is the projection where the demonstrative can be positioned; as in Sio (2006), it makes the phrase specific.

Whether the top-layer is called DP or not is not important. If we simply define "DP" as the outermost layer in the nominal domain (like the outer layer of the sentence is called "CP," whatever the precise function or content), then Chinese has a DP, but if we define "DP" otherwise, it may not.[30]

9 Conclusion

The goal of this chapter was to review the literature on the structure for the noun phrase in Chinese and see whether a converging view can be distilled out of it. A structure of the Chinese noun phrase must take into account: (i) all the different forms the nominal phrase in Chinese can take, as listed in (9); (ii) the interpretational properties of these forms (definiteness, number); (iii) the status and position of "modification marker" *de*; and (iv) the differences between the different varieties of Chinese. At the same time, it must take into consideration general theoretical issues, such as the universality of "DP." We have seen that the concrete structural proposals in the literature can be seen to lead to the structure in (46), which can deal with most of these issues quite straightforwardly, although many questions remain. Also, there are various other nominal-related patterns that this chapter has not been able to discuss, detailed study of which may change the picture that comes out of this overview.[31]

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(2007); and Sybesma and Sio (2008). We thank Chi Pin-Chih and Lin Chin-hui for help with sorting out the Mandarin data, and Joanna Sio and Tang Sze-Wing for help with the Cantonese data, and Andrew Simpson for very helpful comments on an earlier version of the chapter.

NOTES

1 The Cantonese in this paper is the Cantonese as spoken in Hong Kong; see Simpson, Soh, and Nomoto (2011) for a view on variations in Cantonese.

2 Abbreviations used: Dem = Demonstrative; Nume = Numeral; Cl = Classifier, Mod = Modifier; N = Noun. EXP = experiental aspect, SFP = sentence final particle. The superscript numbers in the Cantonese examples are tone marks.

3 In certain special environments (like lists), we find examples such as: *wǒ mǎi-le shū yī-běn* /I buy-PERF book three-CL/; see Tang (1996).

4 With respect to the placement of modifiers with *de* (e.g., possessors, relative clauses), many have claimed that positional differences correlate with interpretational differences. Chao (1968) claims that relative clauses preceding the demonstrative are restrictive, while the ones between the demonstrative and the noun are non-restrictive. See C. T. Huang (1982), Tsai (1994) and Del Gobbo (2001, 2003, 2010) for discussion on whether this claim is correct and on whether Mandarin has non-restrictive relative clauses at all. Lin (2004) shows that non-restrictive relatives do exist and that relative clauses in both positions can be both restrictive and non-restrictive. The difference between the pre-demonstrative and the post-demonstrative relatives seems to be merely a matter of contrastiveness: the former is contrastive, while the latter is not (see also Cheng 1998; Sio 2006). See Tang (2007) for the interpretational difference associated with pre- and post-demonstrative possessors.

5 The numeral is either covert for phonological reasons (it gets suppressed in speech), or for syntactic reasons (the numeral can be left empty in so-called "governed" positions); see Cheng and Sybesma (1999).

6 Demonstratives in Mandarin come in two forms: a. *zhè* "this," *nà* "that" and b. *zhèi* "this," *nèi* "that." The forms in (b) are generally assumed to be a combination of the forms in (a) and the numeral *yī* "one." Speakers apparently differ in the use of the b-forms; we can distinguish three groups of speakers: (i) those who prefer the b-forms in front of a classifier, which suggests that the classifier is always preceded by a numeral; (ii) those for whom these forms are in free variation; and (ii) those for whom the a- and b-forms are only in free variation in front of a classifier, even if that classifier is preceded by another numeral, as in (i). In these cases, the form presumably containing the numeral *yī* "one" combines with other numerals as easily as the bare counterpart.

(i) a. *zhè(i)* *běn* *shū*
this CL book
"this book"

b. *zhè(i)* *sān* *běn* *shū*
this three CL book
"these three books"

The first and third group of speakers only admits the a-forms in contexts in which there is no classifier, such as the phrases in (4) and (5) in the main text.

7 We do not systematically mark tone sandhi in the transcriptions in this chapter.

8 In addition, it is mainly restricted to the numeral "one." However, for "two" and "three," see Chirkova (2004).

9 For example, **nèi-ge tàiyáng chū-lái-le* /DEM-CL sun come.out-come-PERF/ intended: "the sun has come out." In some of these "unique" cases, we may also be dealing with proper name formation, à la Longobardi (1994), as may be the case with cases such as *lǎoshī* "teacher" (see Cheng and Sybesma 1999, and note 14 below.

10 Interestingly, for some speakers, another possibility is [Dem-N]: *nà shū shì wǒ-de* [that book COP 1s-DE] – that is, with a demonstrative, but without a classifier (see Tang 2007 for more discussion of such cases).

11 This observation goes back at least to Chao (1947: 42); see also Zhang (1961). For discussion, see Cheung (1989), Matthews and Pacioni (1997), and Shi (1996), Cheng and Sybesma (1999, 2005). For variation within Cantonese see Simpson, Soh, and Nomoto (2011).

12 The only cases in which bare nouns appear to be used as definites in Hong Kong Cantonese is in reference to unique referents, especially persons, such as in the equivalents of "the teacher," "the president," "the general manager," and even "the sun." These are cases in which the noun has been turned into a proper name, at least according to Cheng and Sybesma (1999).

13 Certain modifiers, in particular possessors and relative clauses, can appear without *de* in front of the demonstrative without the effect of changing from "accessory" to "defining"; also, with kinship terms DE is often not possible, or there will be a change of meaning, similar to what Lu Jianming (pers. comm.) observed with respect to the following phrases, where the phrase with *de* implies there are more boyfriends than just one.

(i) tā (de) nánpéngyǒu
3s DE boyfriend

14 Tang (2007) reports that in Mandarin, a modifer with *de* can also appear between the demonstrative and the numeral, as in (i):

(i) zhè [lǜyōuyōu]-de yī piàn cǎodì (=Tang 2007, ex. 53b)
this green-DE one CL grass
"(lit) this green piece of grass"

However, a slight change of such sentences yields strong ungrammaticality:

(ii) *wǒ tǎoyàn zhè zāng-xīxī de yī-zhī gǒu
I dislike this dirty DE one-CL dog
"I dislike this dirty dog."

This suggests that (i) does not represent the typical case.

15 It should be noted that *de* is not always optional before a demonstrative. Optionality depends on what kind of modifier is associated with *de*; see Cheng and Sybesma (2009: 142–143).

16 For more sophisticated overviews, see Nicholas (2008), Rothstein (2010), and Doetjes (2012).

17 Cheng and Sybesma (1998) present two different syntactic diagnostics to distinguish measure expressions and sortal classifiers. See Hsieh (2008), Tang (2007), and X. Li (2011) for discussions of these diagnostics.

18 For other considerations why Cl is associated with Number, see Cheng and Sybesma (1999) and Hsieh (2008).

19 Why *uk*^{1}*-deng*^{2} "roof" in (29) has no classifier, will become clear below, when we discuss the role of *ge*^{3} (*de*).

20 As Sybesma (2009) admits, this claim must of course be evaluated cross-linguistically in a systematic way, but quite a bit of work has been done in this respect recently. One of the questions is whether the claim must be formulated more specifically, for example, "Cardinals/Numerals can only combine with nouns that are singular." Hungarian (as presented in Ortmann 2000) and Cantonese would fit this bill, and so would Breton, which has singular marking (Doetjes 2012). So-called "plural *-s*" in English would have to be reinterpreted to bring it in line with this claim, which is being done, judging from such publications as: Sharvy (1978), Kayne (2007), Fassi Fehri and Vinet (2004), Borer (2005), Ionin and Matushansky (2004), and De Swart and Farkas (2007). In addition, there are many languages that have mixed systems, in that different forms are used for >10 than for <10 (e.g., Welsh; Hurford 2003: 582ff). There are also languages in which number marking only shows up in correlation with the expression of another notion, such as definiteness (e.g., Gungbe; Aboh 2010; and Basque; Hurford 2003).

21 This is not marking for individuation or "division," it literally is marking for number: sg or pl.

22 The fact that the classifiers can only both appear when there is intervening material is reminiscent of what Szabolsci (1994) observes for D and Det (for which, see below) which can also only both be overt if they are separated by other overt material, viz., certain types of modifiers to the NP.

23 Note that, as Andrew Simpson remarks, we may not conclude that *thîi* and the classifier are in general in complementary distribution, as they sometimes co-occur.

24 Note that in (8), we already saw another aspect that classifiers and modification markers have in common: they can both license noun-ellipsis.

25 In Tang (1990b) Nume and Cl together constitute the head of a KP (Klassifier Phrase). See also Simpson 2005.

26 As Au Yeung shows, this incompatibility is even stronger in Cantonese. He also argues that A. Li's proposal of a NumP in between DP and ClP is very hard to push for Cantonese.

27 A. Li (1999) assumes a D only for phrases that refer. She observes that, although a Nume-Cl-N sequence is typically not acceptable in subject position, if the same sequence obtains a quantity reading, such sequence can appear in subject position, as shown by the contrast in (i):

(i) a. ??sān-ge xuéshēng chī-le dàngāo
three-CL student eat-PERF cake
"Three students ate cake."

b. sān-ge xuéshēng dàgài chī-bù-wán liǎng-ge dàngāo
three-CL student probably eat-not-finish two-CL cake
"Three students probably cannot finish two cakes."

Her proposal is that in the case of (ib), since the noun phrase only has a quantity reading and does not refer, it is only a NumP (not a full DP).

28 See Simpson (2005), as well as Sybesma and Sio (2008) and articles cited therein for detailed discussion on demonstratives as XPs (and not as a D^{0}).

29 See Sio (2006) and Sybesma and Sio (2008) for details and for further evidence provided by Wēnzhōu.

30 See Cheng and Sybesma (2012) for some more discussion of this question.

31 One such pattern is exemplified by the following Taiwanese phrase *tsit-tai tua-tai cchia* /this-CL big-CL car/ "this big car." This phrase is interesting because it contains two classifiers of the same form. However, it only seems to work with adjectives meaning "big" and "small," and the context in which such phrases are used seems to be limited. Still, these are interesting patterns that need to be studied in more detail. Thanks to Andrew Simpson for alerting us; see Liu (2010) for more examples. Another pattern that may be of future interest is the one discussed in Liao and Wang (2011), phrases with two classifiers, one of which is *zhǒng* "sort."

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