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Grammatical Issues in the Chinese Classifier System: The Case of Classifier Reduplication

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Contents

1	Introduction	1
2	Literature Review	3
2.1	Working Definition of what is a Classifier	3
2.2	Typological Considerations	6
2.2.1	Greenberg (1975): Which Patterns Exist and how do they Develop?	6
2.2.2	Croft (1994): Which Semantics do Classifiers Typically have?	10
2.2.3	Chierchia (1998): On the Mass Character of Chinese Nouns.	12
2.2.4	Summary	16
2.3	Influential Accounts of Classification	16
2.3.1	Chao (1968): A Classic Account	17
2.3.1.1	The Determiners that Occur with Classifiers	17
2.3.1.2	Classification of Classifier Items	19
2.3.2	Cheng & Sybesma (1998): Formally Capturing the Measure–Classifier–Distinction	24
2.3.2.1	A Structural Proposal	27
2.3.3	Cheng & Sybesma (1999): On Bare Nouns in Mandarin	31
2.3.4	Monophrasal Approaches	36
2.3.4.1	Yang (2001): The Classifier as a Clitic	37
2.3.4.2	Hsieh (2008): The Classifier as the Head of #P	38
2.3.4.3	The Structure Adopted for this Analysis	39
2.4	Preliminary Conclusion and Open Questions	40
3	On <i>de</i>	41
3.1	Rubin (2002): <i>de</i> as a Modifier	41
3.2	What does <i>de.MFP</i> Mean in a Classifier Phrase	44
3.2.1	Paris (1981)	44

3.2.2	Hsieh (2008)	46
3.3	<i>De</i> -modified nominals as bare nouns	48
3.4	Preliminary Conclusion	50
4	On Reduplication	51
4.1	Previous Analyses	53
4.1.1	Yang (2002): Findings of a Corpus Study.	53
4.1.2	Paris (2007)	56
4.1.3	Hsieh (2008)	58
4.2	Types of Classifier Reduplication Constructions	58
4.2.1	The CLF-CLF-N-Type	59
4.2.1.1	Semantic Behavior	60
4.2.1.2	Syntactic Behavior	63
4.2.1.3	Caveat	67
4.2.1.4	Summary	68
4.2.2	The <i>yī</i> -CLF-CLF-Type	68
4.2.2.1	A First Assessment	68
4.2.2.2	Semantic Behavior	72
4.2.2.3	Syntactic Behavior	77
4.2.3	The NUM-CLF-NUM-CLF <i>de</i> N-Type	77
4.2.3.1	A first Assessment	78
4.2.3.2	Semantic Behavior	79
4.2.3.3	Syntactic Behavior	80
4.3	Summary	83
5	Conclusion	84
	Bibliography	86
	Appendix	89
	Glossary	90
	Zusammenfassung auf Deutsch	91
	Curriculum Vitae	93

List of Abbreviations

ABS	Absolutive
ADV	Adverb
ADVP	Adverb Phrase
AP	Adjective Phrase
ASP	Aspect
CLF	Classifier
CP	Complementizer Phrase
DEM	Demonstrative
DISTR	Distributive
DP	Determiner Phrase
D	Determiner
EAC	Early Old Chinese
ERG	Ergative
IND	Indefinite
LAC	Late Old Chinese
MFP	Modifying Particle
MOD	Modifier
NC	Nominal Clause
NP	Noun Phrase
NUM	Numeral
N	Noun
PART	Particle
PASS	Passive
PERFASP	Perfective Aspect
PL	Plural
PP	Preposition Phrase
PREP	Preposition
PROGASP	Progressive Aspect
Q	Quantifier
SFP	Sentence final particle
SG	Singular
SUFF	Suffix
TP	Tempus phrase

Chapter 1

Introduction

In this thesis, I will discuss some phenomena of classifier reduplication in Mandarin Chinese. I will argue that the data fall in three patterns with distinct grammatical form and usage.

- (i) CLF-CLF-N. This pattern yields the distributive interpretation ‘every N’, as can be seen by its interaction with 都 *dōu* ‘all’, which has been analyzed to be an adverbial distributivity operator. The interpretation can be paraphrased with “every single N”. This kind of reduplication is only acceptable in preverbal position. This can be explained by assuming that the phrase moves to a scopal position DISTP in the sense of Beghelli & Stowell (1997). Also, it can only occur with non-eventive verbs. Structurally, it can be analyzed as a quantificational DP.
- (ii) $Y\bar{t}$ -CLF-CLF-N. The interpretation of this reduplication is a “collective plural” reading with the interpretation ‘many N’. Crosslinguistic evidence suggests that this is a form of mass plural formation. The analysis as plural raises some theoretical questions with respect to the claim that Chinese nouns are considered mass nouns in the literature, which are said not to be pluralizable. Syntactically, the reduplication is analyzed as a morphologically complex classifier.
- (iii) NUM-CLF-NUM-CLF-N. In this form the numeral is the target of the reduplication, and the classifier is doubled along with it. It yields an “iterative” reading, implying spatio-temporal sequentiality. Crosslinguistically, the reduplication of numerals often marks distributivity. Also the Mandarin case is analyzable as a distributive numeral. The distributive interpretation and the

versatility of 的 *de* favors the fact that it can be used in verbal as well as nominal modification.

To provide an adequate description and analysis of the above mentioned phenomena is the primary goal of this analysis. In order to achieve this goal, it is necessary to discuss and evaluate the proposals about the canonical structure of the Chinese nominal domain. The evidence is twofold, it comes from classifier and noun distribution.

In the first domain, some typological literature about the general structure and semantics of numeral classifier languages will be discussed. With respect to the syntactic properties, only proposals dealing specifically with Mandarin Chinese will be considered. The main issues here are whether or not there is a difference between classifiers and measures, and if so, how it is expressed, and what the syntactic structure of these two categories should be. The main point of discord in this sphere concerns the status of the classifier with respect to the quantifier that precedes it. They are generally either analyzed as independent from each other, or the classifier is merged to the quantifier morphologically, which is why these two constituents cannot move apart.

To be able to make sensible statements about classifiers, it is indispensable to have a conception about the syntax and semantics of Mandarin nouns. This is why literature about the interpretation of bare nouns will find also its place in this work.

Specific focus will be put on an item that has not been sufficiently discussed in the literature, namely the modifying particle 的 *de* in its use in classifier phrases. It will be suggested that 的 *de* selects a mass reading of the noun phrase and should be assigned a different structure from the standard classifier phrase.

In this work, all Chinese data will be represented with the respective simplified Chinese character, followed by the italicized transcription in 汉语拼音 *Hànyǔ pīnyīn*, which is the standard transcription system in the People's Republic of China. Also, tone marks are added. Note that these only represent lexical tone, *i.e.* tone *before* the application of phonological processes. An English translation in quotation marks is also given. In cases of quoted examples, I did my best to conform them to this standard. Also, I changed abbreviations to those used in this work, which can be looked up in the List of Abbreviations. Measures will be translated if possible. Classifiers will often not be translated because they are functional categories devoid of lexical meaning, thus a glossary introducing some typical usages can be found in the appendix of this work. The glossary does not contain measures.

The data is collected by myself unless marked otherwise.

Chapter 2

Literature Review

The following chapter will deal with the analysis of the basic properties of classifiers and noun phrases, which are relevant to analyzing the specific reduplication data in chapter 4. In section 2.1, the data that a comprehensive theory on classification in Mandarin Chinese must explain are introduced.

In section 2.2, relevant typological generalizations concerning the word order and diachronic development on the one hand, and the typical lexical semantics on the other hand, will be discussed (Greenberg 1975; Croft 1994). Another issue will be the work by Chierchia (1998), which links the obligatoriness for classifiers to the type of noun phrases.

In 2.3, some accounts on the makeup of classifier and noun phrases will be discussed. Chao (1968) tries to propose a comprehensive treatment of the different functions and interpretations classifiers can assume. His grammar is among the most influential written about Mandarin, thus some of his distributional tests are still used in recent literature. Cheng & Sybesma (1998) propose different structural representations for measures and classifiers. In their subsequent work, Cheng & Sybesma (1999) discuss how bare nouns, *i.e.* phrases without classifiers are interpreted, and how their interpretation is derived formally. Two accounts which argue for the representation of numerals and classifiers in one phrase are also discussed (Yang 2001; Hsieh 2008).

2.1 Working Definition of what is a Classifier

Mandarin Chinese obligatorily uses classifiers. In a nutshell, this term refers to the morphemes that have to appear between numerals, demonstratives or some quantifiers and quantified nouns. These morphemes vary according to semantic features

of the noun. This is the one type of classification that is commonly found in South-East-Asian languages, called numeral classification in typological literature (*e.g.* Aikhenvald 2000), because its most prototypical usage is the one following the numeral. The examples below give a small paradigm of classifier variation.

2.1	一头牛	<i>yī tóu niú</i>	one CLF cow	a cow
2.2	一匹马	<i>yī pī mǎ</i>	one CLF horse	a horse
2.3	一条鱼	<i>yī tiáo yú</i>	one CLF fish	a fish
2.4	一只小鸭	<i>yī zhī xiǎo-yā</i>	one CLF little-duck	a little duck
2.5	一峰骆驼	<i>yī fēng luòtuo</i>	one CLF camel	a camel

As we can see, the classifier differs for different animals. This is due to the semantic features associated with each one of the classifiers and the physical differences between the animals. The classifier 头 *tóu*.CLF is normally combined with larger agriculturally used animals. It can also be used with 羊 *yáng* ‘sheep’ or 猪 *zhū* ‘pig’. This seems to form a contrast to the next example, 匹 *pī*.CLF, in (2.2), which is exclusively used for horses and no other animals. 条 *tiáo*.CLF is used with long animals, such as fish, but also with 路 *lù* ‘road’ or 河 *hé* ‘river’ as well as textiles like 毛巾 *máojīn* ‘towel’. This usage refers to the long form of the objects. It can however also occur with abstract nouns such as 意见 *yìjiàn* ‘idea’ and 新闻 *xīnwén* ‘news’. 只 *zhī*.CLF is also used very productively. It selects for a variety of smaller animals, such as birds *etc.*, but also for artifacts like 鞋 *xié* ‘shoe’. 峰 *fēng* is very interesting, because it is ambiguous between a lexical and a classifier interpretation. As a classifier it is used for camels, but it can be used as a bound morpheme with the interpretation ‘summit’ as well (Guo 2008).

Obviously, quite a number of paradigms like the above can be found. These data should prove the following point: there are many cases in which the classifier reflects physical qualities of the noun. However, often the assignment of the classifier is arbitrary and not easily graspable, similar to the assignment to genders in languages which have them.

In some works (*e.g.* Aikhenvald 2000), gender is treated as a subcase of classification. This comparison is not fully adequate, because numeral classification still tends to be a little more semantically transparent. Another difference is that the gender assignment is comparatively unambiguous, whereas it happens that a noun can have more than one classifier in numeral classifier languages. The most striking difference is that there exists the possibility of realizing bare nouns without using classifiers. A noun in a gender-language can never be realized without a gender-

marking suffix, even if these are not always distinct, zero suffixes can easily be argued to exist. The comparison between gender and classifier systems may be interesting from a diachronic perspective, but is not relevant to the present discussion because the two have too little structural parallels to each other.

A kind of classifier usage that is not regarded as the most prototypical in typological literature, but is very prominent in the actual Mandarin data is the demonstrative usage. This means the classifier can not only be suffixed to a numeral, but also directly to a demonstrative. Consider the following examples:

- (2.6) 这/那 一 头 牛
 zhè/nà yī tóu niú
 this/that one CLF cow
 this/that cow

- (2.7) 这/那 头 牛
 zhè/nà tóu niú
 this/that CLF cow
 this/that cow

Synchronically, these forms are almost identical in usage, they differ a little in their focus connotations. Greenberg (1975) argues that diachronically, the second form has evolved from the first, which may be a grammaticalization step towards a noun class language.

Classifiers are also obligatory with some quantifiers, as the next example shows.

- (2.8) 每 头 牛
 měi tóu niú
 every CLF cow
 every cow

There exists one classifier that does not behave like the ones shown above, namely the default classifier 个 *gè*. This item does not involve any sort of semantic classification, and can consequently be used with an inhomogeneous group of nouns. It is a trait of children's speech to use this classifier across the board.

One of the questions that this work will be faced with is the difference between classifiers and measures, which appear in the same position. The two differ in their degree of selectivity. A classifier can only select for a certain group of items, whereas a massifier does not exert these restrictions. An example is given in the following: 书 *shū* 'book' takes the classifier 本 *běn*. It cannot be combined with any other classifier, thus the following phrase is ungrammatical *一匹书 *yī.NUM pǐ.CLF shū*, because 'book' is used with a classifier for horses.

On the contrary, measures can combine with different nouns, thus the phrases 一群牛 *yī qún niú* ‘a herd of cows’, 一群小鸭 *yī qún xiǎo-yā* ‘a herd of little ducks’ and 一群人 *yī qún rén* ‘a group of people’ are all equally grammatical. Note also that measures also exist in English, and are easily translated because they are a subclass of nouns with a lexical meaning, unlike classifiers. Also, measures are an open class in Mandarin. Beckwith (2007) advances the view that measures are universal across languages.

These are the basic facts an analysis about classifiers in Mandarin has to accommodate, namely classifier variation, the determiner and quantifier construction, and the relation of classifiers to measures.

2.2 Typological Considerations

This section will relate the facts presented above to crosslinguistic data. By doing so, it will be evaluated which properties are specific to Mandarin Chinese, and which are universal. Greenberg (1975) discusses the word order in numeral classifier languages, and its diachronic development. Croft (1994) tries to establish implicational universals for the semantic features that classifiers typically encode, which in his theory differ according to the type of classifier. Finally, Chierchia (1998) views classifiers in a bigger frame of noun phrase denotation. Through this method he also provides an explanation for other typical properties of classifier languages, such as their lack of plural morphology and articles.

2.2.1 Greenberg (1975): Which Patterns Exist and how do they Develop?

Greenberg (1975) makes an important contribution to this work because he gives an overview about which numeral classifier patterns are likely to arise, and which ones are not. Additionally, he talks about the presumed diachronic development of classifiers from a rather free lexeme to a grammaticalized morpheme and the word order change that goes along with it. He also mentions that different numbers do not exhibit uniform behavior in different cardinalities. He concentrates on the diachronic development of Chinese, which is why this article is particularly valuable to this thesis.

Greenberg (1975) schematically represents the possible word orders in the following way:

$$(2.9) ((Q \leftrightarrow CLF) \leftrightarrow N)$$

The double-pointed arrow should indicate that either sequence is possible. Of the logically possible six orders, only four appear. The serializations in which the Quantifier Q and the classifier are separated from each other by the noun are never found in Greenberg (1975)'s corpus. Below, the possible and impossible orders are listed:

$$(2.10) \begin{array}{llll} \checkmark & (Q & CLF) & N \\ \checkmark & N & (Q & CLF) \\ \checkmark & (CLF & Q) & N \\ \checkmark & N & (CLF & Q) \\ * & CLF & N & Q \\ * & Q & N & CLF \end{array}$$

Statistically, the languages where the quantifiers precede the nouns are dominant. This also applies to the classifier cases: the cases in which the quantifier precedes the classifier are more frequent than those in which it follows it. This generalization can also be extended to the cases where the classifier phrase follows the noun (note that Greenberg (1975)'s expression "classifier phrase" refers to the quantifier and the classifier). Thus, the cases $(Q-CLF)-N$ and $N-(Q-CLF)$ are more frequent than the orders $(CLF-Q)-N$ and $N-(CLF-Q)$. Generally, it is more likely that the quantifier precedes the classifier.

The order $Q \leftrightarrow CLF$ is almost always fixed, which means that one language has either the order $Q-CLF$ or $CLF-Q$, but no variation in this respect. This does not necessarily apply to the order of the head noun and the classifier phrase. These may vary within a language, as it is the case in Malay, for example.

Another generalization is that the classifier construction in numeral classifier languages is almost always identical to the measure construction. Nouns which indicate periods of time or units of distance will often lack a classifier, presumably because they are a classifier or measure themselves.

Many languages have constructions where the quantifier need not appear, these are normally interpreted to be singular, and may have a definite, indefinite or neutral reading. It is often speculated that these may arise through deletion of the numeral 'one', which Greenberg (1975) regards as the most unmarked numeral.

From these observations, Greenberg (1975) forms a set of diachronic hypotheses. $Q-CLF$ is presumed to be the unmarked order, which is derived from a $Q-N$ -order before the introduction of classifiers in the respective language. This is also the origin of the classifier construction, because they usually start out as nouns with a specific use. The order of the $Q-CLF$ -complex with respect to the noun is expected to shift

frequently, and to posit the major source for diachronic variation. Greenberg (1975) hypothesizes that the orders in which the quantifier–classifier structure follows the noun phrase appears earlier than the one in which it precedes it, because it violates the general tendency for quantifiers to precede nouns. The spread of a default classifier seems to benefit the Q–N word order.

In the remainder of the article, Greenberg (1975) discusses the evidence for these hypotheses. The development of Chinese takes a big part in this, presumably because the written evidence dates back very far and is comparatively complete. He claims that all modern Chinese dialects have the Q–CLF–N word order. In the oracle bone inscriptions of the 商 *Shāng*-dynasty (about 1600–1046 BC) often groups of humans are suffixed with a quantifier and a classifier, the latter sometimes being a repetition of the head noun. An example is given below (Greenberg 1975:32)

- (2.11) 人 十又六 人
 rén *shí-yòu-liù* *rén*
 man ten-and-six man
 sixteen men

In early documents of the Western 周 *Zhōu* dynasty (1042–771 BC), this construction was already well established. The texts taken into account involve bronze inscriptions and earlier texts of the 书经 *Shūjīng*-collection. The “autonymous” construction, *i.e.* the cases in which the classifier and the head noun are the same, which was illustrated in the example above, is frequent. There exist no “demonstrative constructions” yet, which refers to cases in which the classifier is suffixed to demonstratives. Following Dobson (1959), this period is termed Early Archaic Chinese (EAC). In this period, the following sequences can appear: N–Q–CLF, N–Q, Q–N. The last order appears already in EAC mainly in lists, which is also possible in present-day Chinese, with the difference that the modern formulation involves a classifier, the respective modern order is thus N–Q–CLF. The order Q–N indicates the evolution towards a classifier language is not yet complete.

In Late Archaic Chinese (LAC, 4th–3th century BC), classifiers are not being used. Greenberg (1975) ascribes this to some sort of stylistic emphasis of brevity. Classifiers reappear again in the 汉 *Hàn* dynasty (202 BC–221AD) in a N–Q–CLF order. After this period, the present day Q–CLF–N order begins to emerge, which coincides with major restructurings of the language during the so-called *Han*-Shift. The Q–CLF–N order was compulsory already in 唐 *Táng* dynasty poetry (618–907 AD). The shift to today’s state was complete by the time of the 9th century in popular Buddhist literature, which supposedly was close to the spoken language.

This involved the demonstrative construction as well as the frequent appearance of the default classifier $\uparrow$ *gè*. Other types of written texts do not develop as fast, they exhibit archaic structures for a much longer time.

Another interesting observation concerning the position of the $Q \leftrightarrow CLF$ complex with respect to the noun phrase involves the cardinality of the numerals. In many languages, “paucal” numerals or sometimes only the numeral ‘one’ follow the noun, whereas higher numerals precede it. Greenberg (1975) explains this by assuming that lower numerals occur more frequently, and thus behave more conservatively. This tendency is neutralized as soon as a general classifier has spread across the language, which apparently unifies the position of the phrases.

The prediction that noun succeeding classifier phrases have a tendency to move to a position before the noun does not mean that preceding forms always imply a former succeeding state. Pre-nominal forms may be borrowed from other languages or arise as such.

Greenberg (1975)’s findings are relevant to the discussion of Chinese not only with respect to the diachronic generalizations that are presented, but also because these findings embed the discussion of the language-specific phenomena into a larger picture. Therefore, a synchronic analysis should consider these facts.

One of them is the limited degree of freedom that the classifier has with respect to the quantifier. This prediction is also borne out in Mandarin Chinese. There, adjectives can generally be inserted between the classifier and the noun, but not the quantifier and the classifier. This certainly has semantic reasons, but must also be captured by a syntactic hypothesis.

Also Greenberg (1975)’s generalization that the measure constructions are often identical to classifier constructions hold for Chinese, where they are almost indiscernibly similar. Still, they behave different in some contexts, and both the similarities and the differences should be represented.

Also, a reflex of the unexpected behavior of “paucal” numerals can be found in Chinese. The discussion of reduplications in chapter 4 will exhibit that there are certain types of reduplications in which only the numeral — *yī* ‘one’ can appear. Also for this discussion, Greenberg (1975) will prove relevant.

2.2.2 Croft (1994): Which Semantics do Classifiers Typically have?

Croft (1994) tries to formulate generalizations about which semantic entities are represented in classifier systems, and which different categories typically exist. The semantic generalizations are given in the form of implicational universals. He differentiates the following kinds of classifiers with their respective purposes (Croft 1994:147):

(2.12) Classifier Type	Semantic-Pragmatic Function
Noun Class	Determination (Reference)
Numeral Classifiers	Enumeration
Possessive Classifiers	Possession
Predicate Classifier	Spatial Predication

This summary will concentrate on the generalizations about numeral classifiers, simply because this is the type Mandarin Chinese is generally assumed to have. The type they are most similar to is noun classes, consequently, these are also going to be mentioned in this section.

I will consider noun classes first. These morphemes are found in determiners and other parts of referring expressions, such as concord markers and agreement forms, and are assumed to fulfill the basic functions of identifying and referring. Determiners are often grammaticalized from demonstratives, which diachronically links them to the numeral classifier state, because the demonstrative-classifier pattern can often be found in numeral classifier languages.

He posits the following implicational universal:

$$Animacy \begin{cases} Human/Animate : Sex \\ Nonhuman/Inanimate : Nature, Individuation \end{cases} \quad (2.13)$$

This makes the following predictions: noun classes crucially use the human/nonhuman distinction, among the human nouns, the main feature is the sex of the object. All the distinctions made in the nonhuman domain are supposed to stem from the human classification in the sense that male/female stereotypes are extended to the inanimate class. Shape is claimed never to play a role in this. Another important feature of this kind of classification is that they only distinguish rather few classes.

It is important to notice that one prominent path of grammaticalization is from numeral classifier systems to class noun systems. The specific properties of these classes are caused by their purpose: they are used for “tracking and distinguishing different referents”

Unfortunately, Croft (1994) does not give exhaustive examples and lists of the languages that belong to the class noun languages. With the limited criteria Croft (1994) gives, German would fall into the category a noun class language, as it distinguishes three classes, and class suffixes appear on determiners and adjectives. However, it would be hard to posit that the reason German nouns belong to a certain class is because of extended sexual stereotypes.

Croft (1994)’s view is also opposed by Corbett (2008), who claims that not only are there no principled differences between noun class languages and gender, but also that not all noun class languages make differences according to an abstraction of the stereotypes associated with the human gender system. Of those which do, many nouns are assigned gender intransparently. Next I turn to numeral classifier languages. One crucial difference between noun class languages and numeral classifier languages is that the latter is generally assumed to involve more classes. This is related to the fact that the respective morphemes are crosslinguistically very similar to measure words, which is why normally many measures are included in lists of noun classifications. Croft (1994) correctly points out that what should be counted as classifiers is those items that do not create a new measure for the noun, but simply name one instance of it. A classifier list that is purged from these inaccuracies typically involves a limited amount of classifiers. The implicational universal he defines for the semantics of this class is the following:

$$\text{Animacy} \left\{ \begin{array}{l} \text{Animate/Human} : ?\text{Kin/Status} < \text{Sex} \\ \text{Inanimate/Nonhuman} : \text{Shape} \left\{ \begin{array}{l} < \text{Orientation} \\ \text{Rigidity} < \text{Nature/Function} \end{array} \right. \end{array} \right. \quad (2.14)$$

This means that numeral classifier languages *do* use shape as a semantic principle governing classifier choice, as opposed to noun class languages. Animacy is also assumed to be a basic feature. A typical feature of numeral classifiers is that they often involve classifiers encoding social status. Their purpose is to individualize and

identify units (in order to count them). The individualization function is claimed to be the reason why classifiers in some languages can only appear with lower numbers.

The other two types of classifiers are not crucial to the current discussion, I just want to mention briefly that there exist classifiers which are obligatory with possessive phrases. Those often have different classes with respect to edibility. Also, the usage of different verbs according to the shape or consistency of the argument can be called a classification.

Despite the fact that not all of Croft (1994)'s claims are undisputed, he makes some interesting observations. One of them is that a basic feature in classifier semantics is the shape of objects. Additionally, he assumes social status to play a specifically important role. This claim holds true in Chinese too, as there also exists a classifier for humans with a high status, namely *wèi*. The author suggests the sensitivity of classifiers to social status may be a South-East Asian areal feature.

A categorization that remains rather unclear is between noun classes and numeral classifiers. It seems there do not exist sufficient criteria for positing a clear-cut difference. Croft (1994) claims a typical feature of noun classes is that the class markers show up in the determiner of the noun. This is what has to be claimed for Chinese as well in order to explain the affixation of classifiers to demonstrative pronouns, thus moving Chinese forward on the grammaticalization path that leads from numeral classifier to noun class languages.

Croft (1994) has been cited for his clear differentiation between measure words and classifiers. This is one of the more important findings of this paper to keep in mind.

2.2.3 Chierchia (1998): On the Mass Character of Chinese Nouns.

Chierchia (1998) tries to formulate a modern view of Carlson (1977)'s basic claim, namely that bare plurals refer to kinds in English, thereby also trying to disprove the opposite view that bare plurals are ambiguous between kinds and weak indefinites. Doing so, he tries to account for a number of crosslinguistic properties and variations. In Romance languages as well as German, bare singulars are ungrammatical, except for when they refer to mass nouns. German allows for bare plurals and mass nouns, whereas in the Romance languages the usage thereof is impossible or rather limited. These languages use the indefinite article or a partitive construction as devices for existential quantification and the plural article to express generic interpretations.

Chierchia (1998) makes the following preliminary assumptions about the structure of the domain of discourse. His version of the discourse universe consists of sets of individuals and plural individuals. Pluralization works via an operator which is a function that can only apply to sets of atoms and turns them into pluralities.

The operator is defined as follows (Chierchia 1998:346):

$$(2.15) \quad PL(F) = \lambda x[\neg F(x) \wedge \forall y[ylx \wedge At(y) \rightarrow F(y)]]$$

This definition excludes for not-atomized entities to be pluralized. He defines the definite article in terms of a ι -operator that always chooses the largest number of realizations of a predicate X. Thus, it can apply to pluralities and then yields the biggest number of X, as well as singular items.

Chierchia (1998) rejects the idea that mass nouns come from a distinct counting domain as count nouns. This domain is assumed not to require its members to be atomic. He models mass nouns to be similar to plural expressions in that they come out of the lexicon already pluralized. Their extension thus contains atomic entities as well as sets. The singular/plural distinction is neutralized in these nouns. Words like *furniture* and *water* are thus the same, with the only difference that the minimal portions of the latter are rather vague and determined by context.

Under this assumption, he can explain many features typically associated with mass nouns. Pluralization is excluded because mass nouns are already plural in this kind of understanding. Direct counting is impossible because a set of atoms is required, but in the extension of mass nouns, also non-atomic sets are included. Consequently, measure phrases are used, *i.e.* adopting Krifka (1989)'s conception, a function that maps mass noun denotations into sets of atoms.

In order to go back and forth between kind and individual readings, Chierchia (1998) defines two functions to derive kinds from individuals and *vice versa*. The operator $\cap$, also called 'up' turns a property into the respective kind, whereas the operator $\cup$, 'down' turns a kind into a property. The former can consequently be viewed as a nominalization of predicative common nouns, because it takes a characteristic function of type $\langle s\langle e, t \rangle \rangle$ and turns it into a kind of type e . Conversely, the latter can be regarded as a predicativization.

Building on these foundations, Chierchia (1998) tries to give an answer to the question of the multiple positions that nouns can appear in. They can function as the restrictor of a quantifier in phrases like *every man*, or in predicate position, like in the sentence *John and Bill are doctors*. These differences are captured by two nominal parameters, $[\pm \text{arg}]$ for argumental nouns and $[\pm \text{pred}]$ for predicational ones. This assumption leaves us with the following four possibilities:

- (i) [+arg] [-pred]
- (ii) [-arg] [+pred]
- (iii) [+arg] [+pred]
- (iv) [-arg] [-pred]

(iv) obviously can be excluded, because it would predict the NP not to receive any interpretation at all. The others have the following properties.

[+arg] [-pred] This is the parameter configuration that is most important to the present work, because Mandarin Chinese (as well as other classifier languages, *e.g.* Japanese) falls into this category. In this configuration, every NP is argumental in character and thus kind-denoting, which also means that all the nouns are of type *e*. This allows for the free occurrence of bare nouns. However, determiners are commonly assumed only to take functions of type $\langle e, t \rangle$ as their arguments. This apparent mismatch is resolved by positing a special kind of determiner, which involves the above mentioned ‘down’-operation. An interesting outcome of this assumption is that the application of this determiner is expected to yield a mass denotation. This leads Chierchia (1998) to positing that all NPs in languages like Mandarin Chinese are expected to be mass in a certain way. This explains some of the properties of nouns in Chinese-type languages. It seems obvious that nouns that already are lexically pluralized cannot be the object of pluralization again. The classifiers fulfill the purpose of measure phrases in traditional mass nouns, they serve as a tool for counting.

[-arg] [+pred] This option is also witnessed in natural language, it applies to languages like the Romance family. If this parameter-setting is chosen, every noun is a predicate. Consequently, no bare nouns are expected to appear, because every NP needs to be modified by a DP to be made an argument. This does not mean that in the actual phonological form every noun needs to be governed by an overt determiner, as there exists the possibility for phonologically zero structure. According to general principles, not physically realized categories must be licensed. This seems to be the case in Italian and Spanish, where objects are under certain circumstances allowed to appear in bare form. These positions must be lexically governed.

[+arg] [+pred] German and English are examples of this type of language. Here, both argumental and predicative noun phrases are possible. Chierchia (1998) argues

these languages have the count/mass-distinction already encoded in their lexicon, but they have rather free access to type-shifting operations like the above mentioned ‘up’- and ‘down’-functions. Nouns which are of the argumental type e will normally be mass nouns, while predicational nouns of type $\langle e, t \rangle$ will be count. The plural operation can thus apply freely, and no bare singular count nouns are to be expected.

Apart from its predictions about the structure of Chinese nouns, Chierchia (1998)’s work is of particular importance because of the influence it has had. Many authors think he claims that there is no mass/count distinction in languages like Chinese. However, while his work predicts is that this distinction is not made in the noun, it does not make claims about other items on which the mass/count distinction could be marked. It is important to understand that Chierchia (1998) does not imply that all Chinese nouns are expected not to display atomic entities. In his conceptualization of mass nouns as being lexically plural, it is expected that mass nouns do indeed have atomic items, with the difference that it is contextually determined what they are.

Chierchia (1998)’s assumptions about determiners are much less grounded. He claims that the determiners in [+arg] [-pred]-languages differ from the others in that they involve a ‘down’-operation. However, Mandarin Chinese seems to use other strategies for resolving this type-mismatch. In Chinese, this is because there exist plenty of lexemes normally understood to be determiners (like *e.g.* demonstratives or certain quantifiers) which do not take a bare noun as their argument, but a bare noun plus a classifier. Hence, the mass interpretation cannot arise through the ‘down’-operation in all cases, as it seems implausible that a mass interpretation should be derived from a classified noun. Also, it raises the conceptual question as to whether it is really necessary or wanted to have two kinds of determiners in one language, those that apply a type switching operation and those that do not. In this point, Chierchia (1998)’s theory still needs further refinement.

Chierchia (1998)’s view of conceptualization of the domain of discourse is very elegant, but excludes for the pluralization of mass nouns. This is a process found in many languages. Also the data I collected, which will be presented in chapter 4 stands in contradiction to his claims, because it shows that there are actually forms of pluralization even in a language like Mandarin, where the nouns are assumed to be lexically plural. Also the Greek data from Alexiadou (2009) and Tsoulas (2006) show inconsistencies with this kind of mass noun conception. Further research must solve the question whether Chierchia (1998)’s hypothesis is tenable with respect to

this kind of evidence.

2.2.4 Summary

The typological work presented in this section listed a number of features that Mandarin incorporates, but are typical for numeral classifier languages in general.

Greenberg (1975) points out that in all classifier languages the quantifier has to be adjacent to the classifier. It is also interesting that crosslinguistically, measures look the same as classifiers.

Croft (1994) claimed that typical semantic features encoded in classifiers are shape and social status. Both of these features also play an important role in Mandarin Chinese. Also, he clearly distinguishes the function of measures from those of classifiers and argues only the latter should be considered in typological endeavors. A remaining question in his work is the differentiation between numeral classifier and noun class languages.

Chierchia (1998) relates many of the typical properties of classifier languages to the lack of a mass/count distinction in the nouns. In his conception, this means that these items are lexically pluralized, which bars any further pluralization and the use of articles. This assumption will be challenged in chapter 4.

2.3 Influential Accounts of Classification

In this section, some works discussing the features of Chinese noun and classifier phrases will be discussed. First is Chao (1968), who tries to list all the semantic functions classifiers can take on, and, if possible, also wants to provide distributional criteria in order to keep them apart. Another article which will be discussed is Cheng & Sybesma (1998), whose aim is to present evidence and a structural analysis for distinguishing between measures and classifiers. Cheng & Sybesma (1999) discusses the syntax of Mandarin bare nouns. They describe that there exist different bare N interpretations, according to which different syntactic analyses are offered. From these findings, conclusions will be drawn concerning numeral and classifier phrases. Also, two other accounts will be discussed briefly (Yang 2001; Hsieh 2008). They argue for the representation of the classifier and the numeral within one phrase, either as an instance of cliticization or without additional assumptions, respectively.

The major issues that these contributions should exemplify are the following: What is the syntactic representation of a classifier? How can we capture the fact that it is more closely bound to the numeral than to the noun? Is there a structural

difference between a classifier and a measure? What is the structure of the relevant parts, such as numerals, classifiers and nouns on their own?

2.3.1 Chao (1968): A Classic Account

*The standard grammar when it comes to Chinese is Chao (1968). It is descriptive, but it contains many enlightening views about important topics. Chao (1968) deals with the classifier issue from two perspectives, one is the determiner side, the other one is the classifier items themselves. I will discuss the first aspect in section 2.3.1.1, and the second one in 2.3.1.2.*¹

2.3.1.1 The Determiners that Occur with Classifiers

Generally, Chao (1968) defines determiners and “measures”. It should be added that he does not make a terminological distinction between measures and classifiers, but uses the word “measures” for both of them. to be a complex word. He notes that they can occur alone, but normally modify a noun.

The maximal phrase, *i.e.* a phrases with all possible positions filled, is exemplified in the following:

- (2.16) 这 十 万 卷 书
 zhè shí wàn juǎn shū
 DEM ten.NUM ten:thousand.NUM CLF book
 these 100 000 books Chao (2005:251)

In his analysis, 这 *zhè* ‘this’ is a demonstrative pronoun, 十 *shí* ‘ten’ is a numeral, 万 *wàn* ‘ten thousand’ is a numeral measure, 卷 *juǎn* CLF is an individual measure and 书 *shū* ‘book’ is a noun. I do not exactly agree with his analysis, but it is important to notice that multiple determiners, namely demonstratives and numerals can appear.

Chao (1968) also points out that there needs to be a quantifying element before the classifier, as well as a classifier after each numeral. Adjectives can intervene between the classifier and the noun, but not between the numeral and the classifier, except for when they are perceived to modify the classifier itself. These properties point to the following conclusion: it may be that the quantifier and the classifier are located in one phrase.

The numeral 一 *yī* ‘one’ in object position is often omitted. Chao (1968) relates this to the Mandarin tendency to realize items with definite referents in the subject

¹The original work is Chao (1968). However, I cited the examples from the Chinese translation Chao (2005), adding my own translation. Thus, this is the work that page numbers refer to and the reason for two different citations.

position, whereas indefinites occur in the object position. — *yī* ‘one’ can be used to encode indefiniteness, supporting Chao (1968)’s assumption. However, — *yī* ‘one’ can also appear in subject position, which contradicts his hypothesis.

He notes that the modifying particle 的 *de* can occur between some classifiers and nouns. In his opinion, this is only possible with “measures” in the actual sense, and not with individual classifiers. Thus, the alternation below can be found (Chao 1968:259).

- (2.17) * 三 块 的 钱
 sān kuài de qián
 three CLF MFP money
 three pieces of money

- (2.18) ✓ 买了 三 块 钱 的 肉
 mǎi-le sān kuài qián de ròu
 buy-PERFASP three CLF money MFP meat

To buy meat for three units of money (can refer to any currency) (Chao 2005:254)

Thus, if a speaker wants to identify three Euros, say the three Euros in your wallet, (2.17) is not the right way of expressing this. If a speaker tries to quantify an amount of meat as valuing three Euros, (2.18) is appropriate.

There exists an alternative relative order between the demonstrative and the classifier. In lists only, the demonstrative–classifier complex can appear after the noun, which Chao (1968) qualifies a “predication relation”, in which the N is the subject, and the demonstrative–classifier complex is the object.

Chao (1968) distinguishes four kinds of entities that can precede classifiers:

- (a) Demonstrative Determiners like 这 *zhè* ‘this’, 那 *nà* ‘that’
- (b) Specifying Determiners like 每 *měi* ‘every’, 各 *gè* ‘every single’, 上 *shàng* ‘the next’ *etc.*
- (c) Numeral Determiners like 一 *yī* ‘one’, 二 *èr* ‘two’, 三 *sān* ‘three’
- (d) Measuring Determiners like 满 *mǎn* ‘full’, 半 *bàn* ‘half’ *etc.*

The above summarized what the author said about the syntactic contexts classifiers appear in. The major points to keep in mind are that numerals can co-occur with demonstratives, and that the relation between the demonstrative and the classifier is different from the one between the classifier and the noun.

2.3.1.2 Classification of Classifier Items

In the following, I will turn to the actual classifier items. Chao (1968) analyzes them in nine groups. He states one classifier may belong to more than one of these groups, and that it may be used as a noun as well.²

Classifiers refer to the actual (narrow) sense of the word, namely the kind of classifier that is specific to every noun. An exception to this rule is the general classifier 个 *gè*, which can often be used in addition to a specific classifier that a noun may have. One of the properties of this group is that they are not well-translatable into English. The classifiers can also be used to specify a certain meaning of a polysemic noun. Chao (2005:263) gives the following examples, in which the same noun can take multiple classifiers.

- (2.19) 一 扇 门、 一 道 门、 一 个 门
 yī shàn mén, yī dào mén, yī gè mén
 one CLF door one CLF door one CLF door
 one wing of a door, a passage, a door

This kind of classifier can generally not be used with the modification particle 的 *de*. However, there exist exceptions to this rule (Chao 1968:263)

- (2.20) 一 部 十 本 的 书
 yī bù shí běn de shū
 one CLF ten CLF MFP book
 a book in ten volumes

For understanding this example, it is important to know that 书 *shū* ‘book’ can take two different classifiers, just like 门 *mén* ‘door’ in (2.19) above. What happens in this example according to the author is that one classifier modifies the other, which would in this context mean that 本 *běn* modifies 部 *bù*. The interpretation of 的 *de* in classifier phrases will be dealt with in detail in chapter 3.

Classifiers in V–O–structures These classifiers occur in lexicalized V–O–structures. One of their typical features is that they can occur in object position only. Some examples are given below:

- (2.21) 说 一 口 好 英文
 shuō yī kǒu hǎo yīngwén
 speak one mouth.CLF good English

²Note that more restrictive authors like Croft (1994) would count only a subset of these as classifiers. Regarding this, cf. the argumentation about numeral classifiers on page 11

literally: Speak a good mouth of English, *i.e.* speak English well.

- (2.22) 写 一 手 好 字
xiě yī shǒu hǎo zì
 write one hand.CLF good character

literally: Write a good hand of characters, *i.e.* write characters well. (Chao 2005:265f)

Some instances of this class can also occur in the first class. Another typical feature of this syntactic position is that the quantifier can often be omitted, if it is 一 *yī* ‘one’, which has the special function of an indefinite marker and a numeral at the same time.

Group Measures The next type of measures, group measures, are distinct from the above listed because they refer to groups, not to individuals. Most of these classifiers can be combined with the modifying particle 的 *de*. This class for instance includes 对 *duì* ‘pair’, 打 *dǎ* ‘dozen’, 组 *zǔ* ‘group’, or 班 *bān* ‘class’, *etc.*

Partitive Measures They are very similar to group measures in their syntactic behavior. Their semantics are to a certain extent opposed to those of group measures, because they only denote parts of the natural unit of the noun phrase, whereas group measures denote multiples. Examples are 部分 *bùfen* ‘part’, 半 *bàn* ‘half’, 块 *kuài* ‘piece of’.

Container Measures The items belonging to this group are basically nouns used in a measure function, which can be deduced from the fact that they have a classifier themselves. 的 *de* can always be used. If the root nouns are formed with a suffix, it is omitted in classifier position. Container measures are an open class. Examples are listed below:

- (2.23) 箱子: 一 箱 书
xiāng-(zì): yī xiāng shū
 box-SUFF: one box book
 Box: one box of books

- (2.24) 包: 一 包 糖
bāo: yī bāo táng
 bag one bag candy
 Bag: one bag of candy

- (2.25) 杯子: 一 杯 水
 bēi-(zi): **yī** **bēi** **shuǐ**
 glass-SUFF: one glass water
 Glass: one glass of water (Chao 2005:269f)

Temporary Measures This group resembles the container measures above. The nomenclature may be a little unusual. It is meant to imply that these are not productively used classifier–noun combinations, and often occur in metaphoric expressions. They are frequently combined with 的 *de*, but they only allow a limited class of quantifiers to precede them. Additionally, they can only be used with 一 *yī* ‘one’, and quantifiers implying the meaning ‘full’ or ‘whole’, such as 满 *mǎn* ‘full’ or 全 *quán* ‘the whole’. Consider the following examples:

- (2.26) 一 脸 汗
 yī **liǎn** **hàn**
 one face sweat
 a face full of sweat
- (2.27) 一 嘴 粗话
 yī **zuǐ** **cū-huà**
 one mouth rude-speech
 a mouth full of dirty language (Chao 2005:271f)

It requires further discussion to settle the issue whether or not these examples involve a different usage of 一 *yī* ‘one’ than the others, as well as a slight modification in classifier semantics.

Standard Measures This class refers to measures in the colloquial sense, as they provide abstract conventionalized entities for measuring. They can be used with 的 *de*, and are reduplicable unless disyllabic. Some examples are given below:

- (2.28) 里、 光年、 斤
 lǐ, **guāngnián,** **jīn**
 mile, light year, pound

Chao (1968) finds it worth remarking that these classifiers can also appear in a complex form, as the following example demonstrates:

- (2.29) 六 尺 三 (寸)
 liù chǐ sān **(cùn)**
 six foot three inch
 six (Chinese) foot and three inches (Chao 2005:271)

Quasi-Measures The name for this group was chosen because these measures need not directly combine with nouns. They can appear with 的 *de*. Here are some examples:

- (2.30) 一 站, 一 年, 一 级
 yī zhàn *yī nián* *yī jí*
 one station, one year, one level

It is mentioned that this class is often used not to name something, but to name the quantity or length of something. Crosslinguistically, it is not surprising that there are nouns that inherently have a measure interpretation, thus they do not need measures to apply to them. Greenberg (1975) mentions that it is very common especially for time referring nouns not to need a classifier, but it does not seem surprising that the items which would need classification should vary.

Chao (1968) uses the next two examples to illustrate the difference in meaning between measures and nouns.

- (2.31) 两 国 的 人
 liǎng guó de rén
 two country MFP person
 people of two countries

- (2.32) 两 锅 的 饭
 liǎng guō de fàn
 two pot MFP rice
 two pots of rice (Chao 2005:273)

The quasi-measure example (2.31) expresses that the persons in question come from two countries, but not that the quantity of all persons in these countries are involved. (2.32) on the other hand refers to the amount of rice that fits into two pots, which Chao (1968) would term a container measure usage. What the author neglects here is that the interpretation of these phrases is contextual. There are just as well contexts in which the respective other reading is acceptable, as my informant questioning revealed.

- (2.33) 两 国 的 人 都 在 打 战。
 liǎng guó de rén dōu zài dǎ zhàn.
 two country MFP person ALL PROGASP hit fight
 The people of the two countries are all fighting.

- (2.34) 这 是 两 锅 的 饭 混 在 一起。
zhè shì liǎng guō de fàn hùn zài yìqǐ.
 this is two pot MFP rice mix PREP together
 This is rice from two pots mixed together.

These examples show that the possibility of being used in a measure reading or a specifying reading is not a property of the lexical item, but context-dependent.

Measures for Verbs This class is used whenever verbs need quantification. They are either items that can exclusively be used in this position, or body parts and instruments.

- (2.35) 我 去-过 一 次 张家界。
wǒ qù-guo yī cì Zhāngjiājiè.
 I go-ASP one time place name
 I went to Zhangjiajie once.
- (2.36) 我 把 这 个 足球 踢-了 一 脚。
wǒ bǎ zhè gè zúqiú tī-le yī jiǎo.
 I PREP this CLF football kick-PERFASP one foot.
 I kicked this football (once).
- (2.37) 我 气 得 要 打 他 一 棒。
wǒ qì de yào dǎ tā yī bàng.
 I angry RES want kick he one stick
 I'm so angry I would like to hit him once.

As can be seen in the above sentences from my own research, these classifiers occur in object position, except when the direct object is a pronoun, as it is the case in (2.37). In this example, the pronoun precedes the classifier.

Discussion Chao (1968) is beyond doubt a very important piece of work in Chinese grammar, listing the different functions classifiers can be used for. He is one of the first to use the occurrence of 的 *de* as a criterion, and is also among the first to point out that the choice of quantifiers is not always free and sometimes restricted to 一 *yī* 'one'.

However, one of the major drawbacks in his work is that the classes he poses are not distinctive. The power of such a classification is limited if any of the items can actually occur in a number of classes. The possibility of using the classifier in multiple functions should be further discussed, as well as the regularities that occur with the usage of 的 *de* and 一 *yī* 'one'.

A related issue is that in his treatment the classifier and measuring function is not clearly distinguished. This generalization does not describe the data adequately, because it abstracts away from the grammatical and semantic distinctions found in Mandarin Chinese.

Thus, Chao (1968)’s implicit “lexicalist view” is not the right approach. It is generally not the case that every classifier entry has a specific usage, but it varies according to the context it appears in, with one possible exception, namely the default classifier 个 *gè*, which seems only to be usable in actual classification contexts. His discussion leads the reader to think differently.

2.3.2 Cheng & Sybesma (1998): Formally Capturing the Measure–Classifier–Distinction

In this section I would like to pick out one article dealing with the Chinese realization of the mass–count distinction, namely Cheng & Sybesma (1998). Using the above noted criteria for distinguishing different kinds of classifiers, namely the appearance of the modifying particle 的 *de* and the insertion of adjectives, the authors try to find the syntactic structures to fit these distributions.

They define count nouns as “such nouns that refer to entities which present themselves naturally in discrete, countable units”, whereas mass nouns are said to “refer to substances which do not present themselves in such discrete units (Cheng & Sybesma 1998:385). Referring to Chao (1968) and Paris (1981), they state that the occurrence of the modification particle 的 *de* and pre–classifier adjectives leads them assume that there is in fact a mass–count–distinction in Chinese nouns.

This is not obvious because in languages like English, this distinction is normally represented by the fact that mass nouns can only be quantified using a measure phrase, while in classifier languages like Chinese, a kind of measure phrase or classifier has to be added to every kind of quantification, no matter if it applies to count or mass nouns. It has been assumed by a number of researchers (*cf.* Chierchia 1998, as well as Krifka 1995, Graham 1989. The latter two are cited after Cheng & Sybesma 1998) that in classifier languages like Chinese all nouns are mass nouns. Cheng & Sybesma (1998) neglect that the criteria above are by far not the only way to distinguish count from mass nouns.

The analysis rests on this distinction, originally mentioned in Tang (1990:408):

- (2.38) 三 磅 (的) 肉
 sān *bàng* (*de*) *ròu*
 three CLF.pound (MFP) meat

three pounds of meat

- (2.39) 两 箱 (的) 书
liǎng xiāng (de) shū
 two CLF.box (MFP) book
 two boxes of books

The above examples stand opposed to the following:

- (2.40) 八 头 (*的) 牛
*bā tóu (*de) niú*
 eight CLF.head (MFP) cow
 eight cows

- (2.41) 九 根 (*的) 尾巴
*jiǔ gēn (*de) wěiba*
 nine CLF (MFP) tail
 nine tails

- (2.42) 十 张 (*的) 桌子
*shí zhāng (*de) zhuōzi*
 ten CLF (MFP) table
 ten tables

Cheng & Sybesma (1998) think that the former group (examples 2.38 and 2.39) belongs to the group of ‘mass-classifiers’ or ‘massifiers’, whereas the latter group (examples 2.40 through 2.42) constitutes so-called ‘count-classifiers’. They adopt the view represented in Croft (1994), namely that massifiers create a unit of measurement, while count-classifiers only name a unit of measurement, but do not create it. This is supposed to represent the distinction between count and mass nouns in Chinese. As they mention themselves, their examples actually do not support this assumption, because ‘book’ in (2.39) is normally considered to be a count noun.

The authors see the same distinction reflected in the distribution of pre-classifier adjectives, also first mentioned by Tang (1990:418):

- (2.43) 一 大 张 纸
yī dà zhāng zhǐ
 one big CLF paper
 one large sheet of paper

- (2.44) 那 一 小 箱 书
nà yī xiǎo xiāng shū
 that one small CLF.box book
 that one small box of books

These examples form a contrast to the following ones:

- (2.45) 一 大 只 狗
 $y\bar{1}$ $dà$ $zh\bar{1}$ $g\check{o}u$
 one big CLF dog

- (2.46) * 一 大 位 老师
 $y\bar{1}$ $dà$ $wèi$ $lǎoshī$
 one big CLF teacher

The reason for the ungrammaticality of (2.45) and (2.46) is that pre-classifier adjectives can only be inserted with count-classifiers. It has however been shown in Li (2009) that adjective insertion is also grammatical with prototypical count nouns.

Concerning the phrases with 的 *de*, Cheng & Sybesma (1998) analyze that the presence or absence of the particle does make a difference in interpretation. They note that a phrase like 三杯子的酒 $sān\ bēi(zì)\ de\ jiǔ$ (three CLF.glass MFP liquor) ‘three glasses of liquor’ actually denotes ‘enough liquor to fill three glasses’. One argument for this is that this phrase used in a sentence does not mean that there exist three glasses in the real world, but only that the quantity of liquor that fills three glasses exists. Another restriction of the 的 *de*-modified phrases is that they cannot cooccur with the demonstratives 这 $zhè$ ‘this’ and 那 $nà$ ‘that’. Additionally, they do not combine well with relative clauses of which the noun is the head, no matter whether this clause is put before the numeral or the noun.

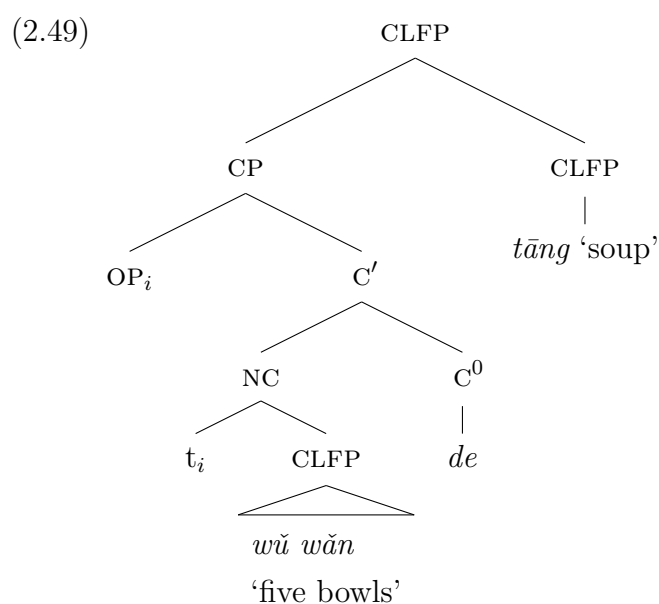
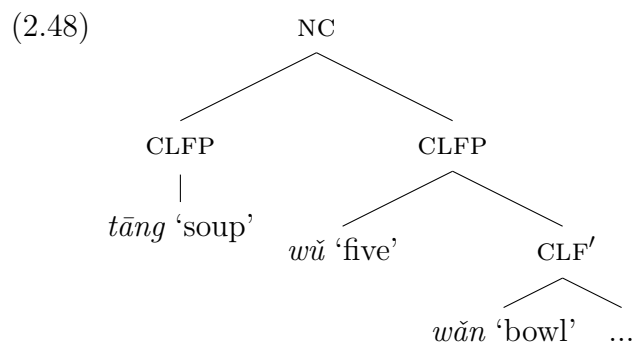
The authors note that there also exists an alternative acceptable word order to the standard order NUM-CLF-N. In some contexts, also the order N-NUM-CLF is possible. This is argued to be a nominal subject-predicate structure. The structure is assumed to be base-generated this way and does not result from noun movement. They give the following sentence as an example:

- (2.47) 胡匪 喝了 汤 五 碗
 $Húfēi$ $hē-le$ $tāng$ $wǔ$ $wǎn$
 Hufei drink-PERFASP soup five CLF.bowl
 Hufei drank five bowls of soup.

This sentence, being a subject-predicate-structure, differs in interpretation from the unmarked word order version. It is true when the subject 汤 $tāng$ ‘soup’ fulfills the condition 五碗 $wǔ\ wǎn$ ‘five bowls’, *i.e.* that there exists as much soup as five bowls. The act of soup-drinking described in (2.47) does not necessarily involve a bowl as a tool, however, which means it does not presuppose that there exists an actual bowl in the real world. A similar interpretation was also found in the 的 *de*-modified structures of examples (2.38) and (2.39).

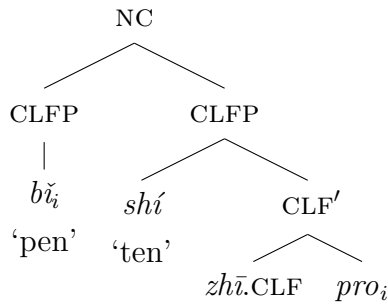
2.3.2.1 A Structural Proposal

Cheng & Sybesma (1998) assume the form N–NUM–CLF to be the underlying form for the 的 *de*-modified cases. In these, the NUM–CLF-structure is moved in front of the noun via relativization. Note that 的 *de* among its other functions as an adjective marker and a possessive suffix is also used to mark relative clauses. Consequently, the moved structure is thought to be a relative clause.

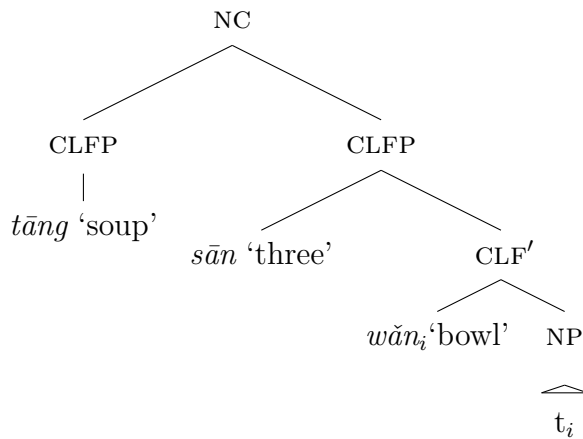


Cheng & Sybesma (1998)'s general idea is to claim that there exist two distinct kinds of classifiers, count-classifiers and massifiers, that appear in different structural configurations. The difference in structure between the word order N–NUM–CLF with count and mass classifiers can be seen in the following:

(2.50) Count Classifiers:

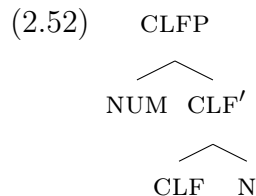


(2.51) Mass Classifiers:

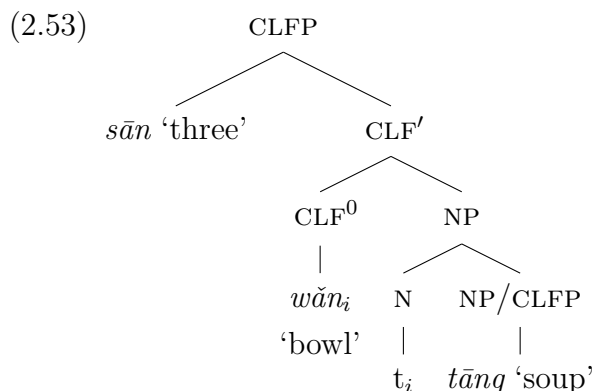


What this means is that the count classifiers in this order are actually generated this way, and involve a case of binding a covert pronoun. The nouns in mass classifier structures involve movement from the N to the CLF position. This is thought to be a way of capturing the fact that many mass-classifiers can appear as a noun independently.

Consequently, they also analyze the default word order NUM–CLF–N to exhibit structural differences depending on the type of classifier they are endowed with. The count cases are simple: a CLFP takes a numeral as its specifier and a noun as its complement.



The massifier cases start out from the following structure:



Lateron, 碗 *wǎn* 'bowl' is moved to the CLFP. Cheng & Sybesma (1998) posit a feature distinguishing count from mass classifiers. The latter are marked with a [+CONT] feature to mark containers.

Discussion The paper by Cheng & Sybesma (1998) is very important to the present discussion because it is among the few that makes clear predictions. It is expected for every language to have a reflex of the mass–count distinction. To a certain degree, Chinese uses its classifiers as a measure to encode this distinction. This means that there exist certain classifiers which are more likely to appear in a count environment. This does not exclude for these items to appear in measure contexts.

However, Cheng & Sybesma (1998) want to root the mass–count distinction exclusively in the classifiers, by saying that some classifying items are inherently count, while others are mass. This view has severe drawbacks. Not only do they use a very incomplete definition of count and mass nouns, but their data does not support their analysis 100%, because it cannot capture that many classifiers are ambiguous between classifier– and massifier readings, and the reading is distinguished contextually. Crosslinguistically, it is expected that there are ambiguities between count and mass nouns, and that some nouns may vary between mass and count interpretation. A comprehensive analysis should be able to capture this possibility.

It is plausible that there are different structures for count and mass readings, but the count/mass distinction need not necessarily be marked on the classifier in the lexicon, as would be a consequence of their suggestions. If they did without this claim, they could avoid contradicting data like (2.39).

The data they give do not conclusively point it the direction they go. Both the 的 *de*–modification and the N–NUM–CLF word order in (2.47) can be used with mass as well as count classifiers. This is also true for adjectival modification (Li 2009).

Another point of criticism is their structural representation of the 的 *de*–marked

cases. It is not clear how they would conclude that this is a case of relativization, because 的 *de* can appear in a whole variety of contexts, namely also in the formation of adjective phrases and possessive pronouns. It remains unclear why Cheng & Sybesma (1998) prefer to posit a biclausal structure, as the analysis as an “of”-like element in English, and thus the marker of SPECNP, would be much more obvious.

It is also questionable to derive a highly productive process, namely the usage of measure phrases, from a barely grammatical and highly context dependent form like the N-NUM-CLF word order. Note that, as they think all instances of 的 *de* are relatives, they predict for all of them to be derived in nominal clause structure, and then be relativized. The remaining question is why 的 *de* used in other contexts does not show word orders with the noun preceding its modifier.

Additionally, the structure in (2.53) is not tenable in a minimalistic framework, in which movement is viewed as a feature driven process. In this structure, it is assumed that a noun phrase merges with an empty classifier. Despite the fact that there exists the apparatus for empty phrases, they are not motivated sufficiently in Cheng & Sybesma (1998). In a view that sees feature-checking as the reason for movement, the reader would like to know which features are involved. If it is the [+CONT]-feature, it must be further explained why nouns with such a feature can also appear in N, if it is this feature that triggers the movement. Also, this configuration would predict for the appearance of empty classifiers, which is obviously not found in Mandarin Chinese. As the authors note themselves, another possibility that this structure would allow for is to have two classifiers, which the data shows to be impossible. What can be found are complex classifier structures, in which a classifier is embedded in a measure phrase, as was shown above in example (2.20). It is not clear how these examples would be incorporated in their analysis, but at first sight, their structure predicts for a CLF-Measure order in these phrases. The order found in Mandarin is invariably the other one.

In my own work, I intend to take up the idea that classifiers and measures are structurally different. I do not agree with Cheng & Sybesma (1998) in that this difference is a lexical property of the classifying item. It is more likely that classifiers are ambiguous between a classifier and a measure usage, whereas measures can only appear in mass contexts. It is possible to capture the ambiguity in a distributed morphology-framework, where one root is embedded in different functional environments. For the reasons given above, the structure of the measure cases will have to be reevaluated.

2.3.3 Cheng & Sybesma (1999): On Bare Nouns in Mandarin

Cheng & Sybesma (1999)'s aim is to find a syntactic representation for the differences found in bare noun interpretations of Mandarin and Cantonese. The basic objective of their article is to explain the following set of data (Cheng & Sybesma 1999:509ff. The characters and tones are added by myself.).

- (2.54) 胡匪 买 书 去 了。

Húfěi mǎi shū qù le.

Hufei buy book go SFP

Hufei went to buy a book/books.

- (2.55) 胡匪 喝完了 汤。

Húfěi hē-wán-le tāng.

Hufei drink-finish-PERFASP soup

Hufei finished the soup.

- (2.56) 我 喜欢 狗。

Wǒ xǐhuān gǒu.

I like dog

I like dogs.

- (2.57) 狗 要 过 马路。

Gǒu yào guò mǎlù.

dog want cross road

The dog wants to cross the road. *not:* A dog wants to cross the road.

- (2.58) 狗 今天 特别 听话。

Gǒu jīntiān tèbié tīnghuà.

dog today very obedient

The dog/dogs was/were very obedient today.

- (2.59) 狗 爱 吃 肉。

Gǒu ài chī ròu.

dog love eat meat

Dogs love to eat meat.

Cheng & Sybesma (1999) state that the bare nouns in these sentences are interpreted in different ways. The postverbal sentences behave like this: (2.54) is indefinite, (2.55) is definite, (2.56) is generic. In preverbal position, (2.58) is definite, (2.59) is generic, but an indefinite interpretation in (2.57) is excluded, thus the sentence is interpreted as definite.

Cantonese behaves differently. First of all, it is possible in Cantonese to use bare classifiers in sentence-initial position, which is impossible in Mandarin Chinese. In this language, the combination [CLF+N] is used to encode definiteness. Consider the following examples (Cheng & Sybesma 1999:510).

- (2.60) *Wufei heoi maai syu.*
 Wufei go buy book.
 Wufei went to buy a book/books
- (2.61) *Wufei jam-jyun *(wun) tong la.*
 Wufei drink-finish CLF soup SFP
 Wufei finished drinking the soup.
- (2.62) *Ngo zungji gau.*
 I like dog
 I like dogs.
- (2.63) * *Gau soeng gwo maalou.*
 dog want cross road
 A dog wants to cross the road
- (2.64) *Zek gau gamjat dakbit tengwaa.*
 CLF dog today special obedient
 The dog is specially obedient today.
- (2.65) *Gau zungji sek juk.*
 dog like eat meat
 Dogs like to eat meat.

This shows that bare nouns can be indefinite in postverbal position in (2.60), but not in preverbal position in (2.63). Generic nouns can appear in both positions (see 2.62 and 2.65). For definite readings, Cantonese uses [CLF+N]-phrases, as is shown in (2.61) and (2.64).

They summarize the interpretation possibilities as follows (Cheng & Sybesma 1999:528):

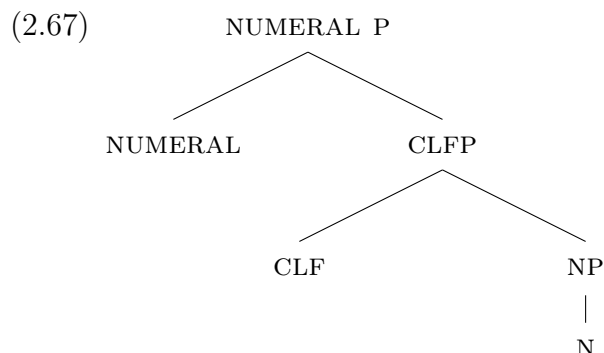
		Mandarin		Cantonese	
		Indef	Def	Indef	Def
(2.66)	bare N	+	+	+	–
	CLF + N	+	–	+	+
	NUM + CLF + N	+	–	+	–

This should capture the fact that phrases with an overt numeral are always interpreted indefinite, phrases with an overt classifier vary across the two languages, and a bare noun can be indefinite and definite in Mandarin, but must be indefinite in Cantonese.

This is the data that they try to account for. In order to do so, their analysis is rested on the following assumptions: Cheng & Sybesma (1999) assume that parallel to other languages, bare nouns with an indefinite interpretation have to be lexically governed, because what is fulfilled by D in the other languages is assumed by the classifier in Mandarin and Cantonese. The authors deny the claim that in classifier languages all nouns are said to be mass nouns. Instead, four domains are assumed, namely singular, plural, count mass and mass mass. Additionally, they think the difference is not expressed in the noun itself, but in the choice of the classifier, bearing the covert assumption that there are certain classifiers that can only be used with count nouns, and others with mass nouns. The well-known criteria of the *de*-insertion and adjective insertion are cited. The difference between count and mass nouns is assumed to lie in the fact that the former have minimal entities, whereas the latter do not.

Cheng & Sybesma (1999) define that it is the function of the classifier to pick out one instance of the property that is denoted by N. This leads them to more or less equate a classifier with a determiner, because they attribute the same function to it. Note that standard semantic theories assume that the picking out of one instance out of a multiplicity of instances is exactly the function of a Determiner. They additionally assume that a classifier has a singularizing function, an assumption that is technically unnecessary because of their dispensing with the mass-character of Mandarin nouns. Thus, in their model of the world, there *does* exist a mass/count distinction, and a classifier (as opposed to a massifier) can only select items from the count domain. How to formally capture the difference between the two domains is left unspecified in their paper. As has been criticized in a recent article by Wu & Bodomo (2009), they claim that the classifier assumes a deictic function, *i.e.* the function taken over by articles in languages that have them.

Their answer to the puzzle that the multiplicity of interpretations of bare nouns poses them is the following. What appears to be a bare noun is actually realized with a covertly present classifier and numeral phrase. They posit the following structure as default:



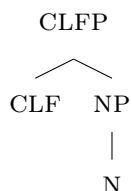
An indefinite bare noun always has to have the full structure above it, and a covert numeral is realized because these are always taken to be indefinite. In the definite case, a classifier phrase is realized, and the noun moves there, which is required by the ι -operator, which encodes definiteness. The same happens in the case of proper names.

Thus, there are two possible structures for Mandarin and Cantonese nouns:

The structure for indefinites is the full structure presented in (2.67), with the NUMP and CLFP covertly realized.

The tree-diagram below schematizes the structure for definites.

(2.68) Structure for Definites



When the phonetic realization is a [CLF+N]-structure, we have observed above that this structure can have two interpretations in Cantonese, either definite or indefinite. In the former case, the phonetic form equals the underlying form, in the latter, the classifier is preceded by a covert numeral. In Mandarin, it is assumed that a classifier can never be realized without a numeral, thus the definite interpretation is not available.

Another question is why the Cantonese bare nouns cannot be definite. Cheng & Sybesma (1999) explain this by claiming that the ι -operator, which is assumed to bring about the definite reading, is not available in Cantonese for minimality reasons. Cantonese has an overt item to assume this function, namely classifiers. As for generics, they assume for them to behave like proper names, consequently, in their theory, they also undergo N-to-CLF-movement.

Cheng & Sybesma (1999) point out that crosslinguistically in noun class languages, classification is conflated with determination. In the search for similar phe-

nomena in Chinese, they argue that classifiers may be the locus of grammatical number. They do so on grounds of the “plural classifier” 些 *xiē*, as well as classifier reduplication. It will be discussed in section 4.2 whether these phenomena can be analyzed as a classifying structure in the usual sense.

It is not made explicit, but it seems Cheng & Sybesma (1999) want to do away with the category D in Chinese. Their claim is that CLF and NUM fulfill all the functions that are taken over by D in non-classifier-languages.

Discussion Cheng & Sybesma (1999)’s work is groundbreaking as well as controversial. It tries to find a structural account for the long-ignored phenomenon of different interpretations in pre- and postverbal positions, capturing the asymmetry in the distribution.

Additionally, it is an approach which tries to syntactically represent different interpretations in a compositional manner. This gives a set of interesting predictions, which would have to be further tested. A hierarchy of interpretations can be assumed, in which the definite case is default. The analysis predicts for a definiteness-encoding CLFP to be present always, and an infinite NUMP only in specific cases.

However, their analysis still includes many stipulations. One of them is the occurrence and interpretation of NUMPs. As we have already discussed, empty NUMPs must be licensed. However, this does not explain the interpretation of these phrases. An overt NUMP can take on values from zero to infinity, but their covert correlate can only be interpreted as ‘one’, even if another interpretation is contextually licensed. This is not well-motivated in the article.

Another deficiency in their analysis is that it is not made clear whence the differences in interpretations arise. They use the descriptive label “pre-verbal” and “post-verbal position”. A plausible assumption would be to relate this to topic and focus phenomena. However, neither their data nor their analysis allows for an integration with topic/focus-theory.

An incomprehensible trait in their article is their resistance to Chierchia (1998)’s claims. It seems from their analysis that they would welcome many of the predictions he makes, for instance the predicted lack of plural morphology and articles. Additionally, they do not give counter-evidence to his claim that the count/mass-distinction is not encoded in the noun, but actually support it by saying that the distinction is marked somewhere else. In this discussion, the opinion they express seems not very clear and somewhat contradictory.

Cheng & Sybesma (1999)’s argument that the classifier in Chinese takes over many functions that articles are used for in other languages is very interesting.

Generative theory so far has not gone into the fact that there exist some relations between typical D functions and classifiers. A problem in their analysis is that it does not include all the relevant data. Mandarin Chinese numeral-classifier phrases can be preceded by demonstrative pronouns and QPs. If definiteness and indefiniteness is encoded in the classifier already, it is not clear what the predictions and implementation should be for these cases. A question that will be dealt with in chapter 3 concerns the interpretation that noun phrases get under modification. Cheng & Sybesma (1999) do not indicate how phrases like these are expected to behave. It is left unclear how precisely they want to implement the category D in Mandarin. Possibly they do not want to use it at all, or maybe split its functions up to other prejections.

In my own analysis, the idea that definite, indefinite and generic bare noun readings are represented by different covert structures will be adopted. A remaining open question is how other readings are to be represented. This particularly concerns the 的 *de*-modified classifier phrases. It will be discussed whether covert structure must be assumed for these structures as well.

2.3.4 Monophrasal Approaches

It is a well-known fact that a classifier can almost never appear alone, and that a numeral must always be followed by a classifier, except in its mathematical usage. A problem with a classifier structure such as the one assumed in (2.67) in Cheng & Sybesma (1999) is also exemplified in the following contrast:

- (2.69) ✓ 一 个 很 甜 的 苹 果
 $y\bar{1}$ $g\grave{e}$ $h\check{e}n$ $ti\acute{a}n$ de $p\acute{ing}gu\check{o}$
 one CLF very sweet MFP apple
 a very sweet apple

- (2.70) * 一 很 甜 的 个 苹 果
 $y\bar{1}$ $h\check{e}n$ $ti\acute{a}n$ de $g\grave{e}$ $p\acute{ing}gu\check{o}$
 one very sweet MFP CLF apple

This contrast is unexpected if the all the three constituents involved, namely NUMP, CLFP and N, are represented in separate phrases. For the sake of completeness, let me just add that adjectival modification of measures is possible, but only in a very limited number of cases:

- (2.71) 一 大 箱 苹 果
 $y\bar{1}$ $d\grave{a}$ $xi\bar{a}ng$ $p\acute{ing}gu\check{o}$
 one big CLF.box apple

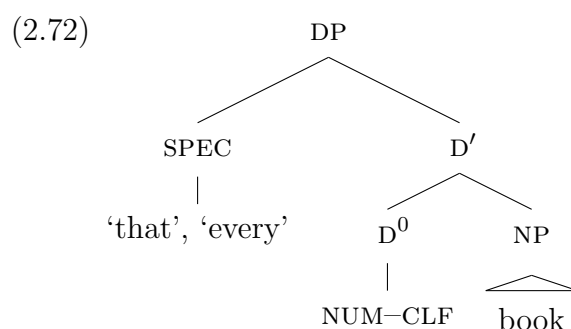
a big box of apples

This usage is only possible with bare adjectives, meaning that they cannot occur with the pre-adjectival adverb 很 *hěn* or the particle 的 *de*. Also, only adjectives referring to size, such as 大 *dà* ‘big’, 小 *xiǎo* ‘small’ or 长 *cháng* ‘long’ are acceptable in this position. It has been argued that this position is only possible with so-called “massifiers”. Li (2009) shows that also classifiers can be used in this construction under certain circumstances. The restricted nature of these cases does not disprove the claim that a tri-phrasal representation cannot capture this distribution.

In order to circumvent this problem, some authors assume a structure where the numeral and classifier are represented in the same phrase. Below, the proposals by Yang (2001) and Hsieh (2008) are discussed briefly. Also, the version I will adopt for this analysis is discussed.

2.3.4.1 Yang (2001): The Classifier as a Clitic

Yang (2001:64) argues for the classifier to be a clitic to the numeral. She proposes a structure like the following.

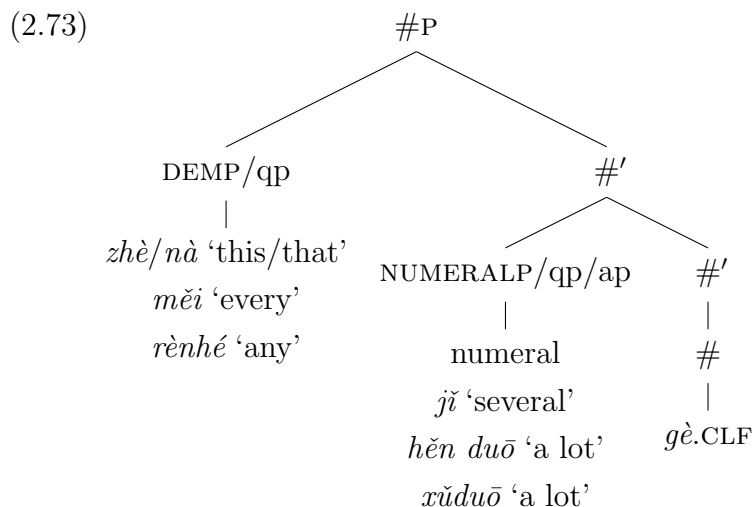


This implies that the numeral and the classifier form a complex head, which is derived morphologically in the lexicon. The intuitions behind this are that there can be very limited intervening categories between the numeral and the classifier. According to Yang (2001), other elements may occur in the D-head, because it is not occupied by articles. This is an argumentation that seems not tenable if economy of representations is assumed. Additionally, as the author points out herself, it remains unclear why the numeral need not appear sometimes while the classifier is realized. An argument for the clitic character of the classifiers (as opposed to being an affix) is that they are not selective of their host, which is why they can occur with demonstratives, quantifiers and verbs.

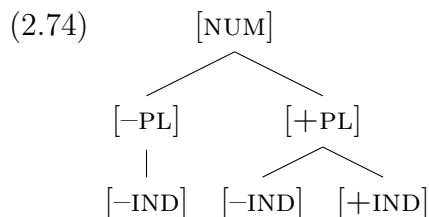
2.3.4.2 Hsieh (2008): The Classifier as the Head of #P

Hsieh (2008)'s analysis is based on facts about definiteness/indefiniteness and plural realization. The approach she chooses can be described as templatic: she thinks that the plural/singular distinction has a specific locus, as does the definiteness/indefiniteness distinction. Additionally, she assumes a #P, following Borer (2005), which hosts expressions of number.

Hsieh (2008:64) proposes the following structure:



In this structure, the #-head exhibits the following feature taxonomy. The dependencies of the features [$\pm$ Plural] and [$\pm$ Indefinite] are assumed as follows:



What this should imply is that phrases marked [-PL] are also always [-IND], whereas [+PL] phrases can be [$\pm$ IND].

The value [-PL -IND] will be assigned if a simplex classifier merges with the numeral 一 *yī* 'one'. If it is merged with a number bigger than 'one', the features are valued [+PL -IND]. Other quantifiers such as 几 *jǐ* 'some', 许多 *xǔ duō* 'many' 很多 *hěnduō* 'many' get a [+PL +IND] feature valuation.

While it is easy to come to the conclusion that the classifier should be represented within the same phrase as the numeral, the argumentation with respect to number is not that easy to follow. For instance, Hsieh (2008) claims a morphologically simple classifier is realized without a number value. This claim is disputed by the data:

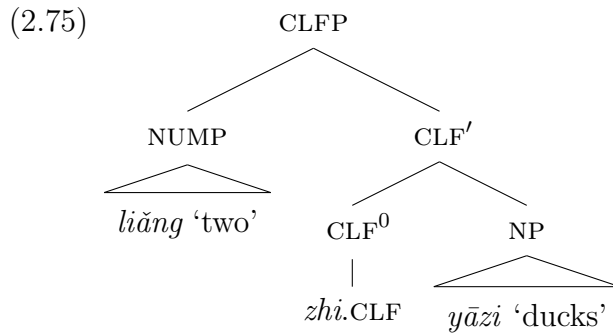
whenever a classifier is realized without a preceding quantifier or demonstrative, it is interpreted singular, strongly suggesting that this would be its default interpretation.

Another problem is that Hsieh (2008) represents the number feature as two binary features, suggesting that a fourfold distinction can be made. However, such a distinction is not found in her data.

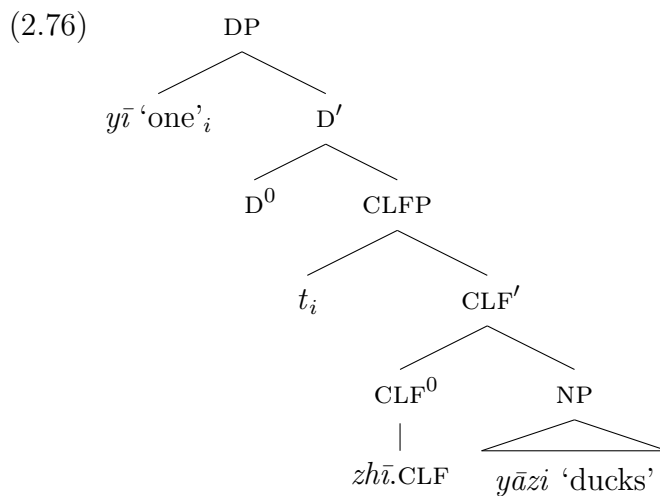
This section showed that there are some approaches capturing the difference in relationship between the noun and the classifier, as opposed to between the classifier and the numeral. This captures a basic intuition coming from the behavior of intervening adjectives, but the concrete proposals are not elaborated well enough.

2.3.4.3 The Structure Adopted for this Analysis

In my analysis of the reduplication, I will assume the following structure for NUM–CLF–N–sequences like 两只鸭子 *liǎng zhī yāzi* ‘two ducks’:



As will be discussed in more detail below (see section 4.2.2), the number — *yī* ‘one’ displays ambiguity between a numeral in the narrow sense and an indefinite pronoun. In the latter usage, the structure will be the following:



In its strict numerical usage, — *yī* ‘one’ may also appear in the specifier of the CLFP. In its deictic usage, however, it is assumed that it will move to DP.

As was discussed above, this structure should capture the fact that numerals and classifiers are dependent on each other.

2.4 Preliminary Conclusion and Open Questions

This chapter presented a review of the literature relevant to the topic of the semantic and syntactic properties of Mandarin classifiers and nouns.

It was shown that in many respects, Mandarin classifiers behave very much according to standard assumptions about classifiers. They involve the most unmarked word order, and also the diachronic development can be found in other languages. Again typical for classifier languages, the measure and classifier constructions look the same (Greenberg 1975). With respect to the semantic features they encode, they fit into the pattern of South–East–Asian languages, which often encode shape and social status. As for the question why classifiers must be used, it can be assumed that this is due to the mass–character of Mandarin nouns. If mass nouns are represented as lexically pluralized, this can also be shown to be the reason why articles and plural morphology does not show up in classifier languages (Chierchia 1998).

Regarding the representation of the different types of Mandarin classifiers, several approaches were introduced. The seminal work by Chao (1968) proposed to use the appearance of the particle 的 *de* as a criterion to distinguish between individual and all other classifiers. Cheng & Sybesma (1998) propose different structural analyses for measures and classifiers.

The syntactic structure of classifiers themselves can be represented as involving multiple phrases, as proposed by Cheng & Sybesma (1999), or as involving one phrase, as in Yang (2002) and Hsieh (2008). A monophrasal option was chosen for this work.

Many open questions remain, some of which will be discussed in the next chapters of this thesis. Chierchia (1998)’s work raises the issue of whether it is true that there cannot be plurals in classifier languages, and how to account for plural–like morphology. This will be touched upon in section 4.2.2. Chapter 3 will briefly discuss another open question, namely the modifying particle 的 *de*, and will again discuss the encoding of the count–mass distinction in Mandarin Chinese.

Chapter 3

On *de*

The well-disposed reader may have noted the frequent reference to the modifying particle 的 *de*. The research on this topic turns out to be rather demanding, because so far little work has been dedicated exclusively to the topic of the usage of 的 *de* in classifier phrases, even less work treated it in a satisfying manner.

This is how I will proceed from this point in order to answer the intricate question that this particle poses. In section 3.1, I will discuss a treatment of 的 *de* as a modifier, as seen in Rubin (2002). Section 3.2 deals with the usage and function of 的 *de* in a classifier phrase. Proposals by Paris (1981) and Hsieh (2008) will be considered.

3.1 Rubin (2002): *de* as a Modifier

The work by Rubin (2002) poses the item 的 *de* to belong to the class of modifiers. On grounds of data from several languages such as Tagalog, Romanian, and also Mandarin Chinese, he posits the functional category ‘Modifier’, which exhibits a uniform behavior. The significance of the label ‘functional’ is that they resemble functional categories CPs or TP in behavior.

The proposed structure is the following:

$$(3.1) \text{ } [_{\text{MODP}} \dots [_{\text{XP}} \dots]]$$

An interesting property he mentions is that modifiers can combine with different categories, such as NPs, APs, PPs, CPs and ADVPs.

For Chinese, Rubin (2002:25f.) gives the following examples:

- (3.2) 你 可以 慢慢地 走。
Nǐ kěyǐ màn-màn-de zǒu.
You can slow-slow-MFP go

You can walk slowly.

- (3.3) 那个 钟 叮当叮当地 响。
Nèi-gè zhōng dīngdāngdīngdāng-de xiǎng.
 That-CLF bell dingdong-dingdong-MFP make.noise.
 That bell makes noise in a dingdong-dingdong manner.

- (3.4) 你 显然地 会 唱 歌。
Nǐ xiānrán-de huì chàng gē.
 you obviously-MFP can sing song
 You obviously can sing.

These data show that 的/地¹ 的 *de* can be combined with adjectives, onomatopoeia and adverbs, because the adverb 显然 *xiānrán* ‘obviously’ cannot function as a predicate. The next example shows it must also be used with PPs. (Rubin 2002:27)

- (3.5) 那 一本 在 桌子上 *(的) 书
*Nà yī-běn zài zhuōzi-shàng *(de) shū*
 that one-CLF PREP table-on MFP book
 That book (on the table)

It is also used in adjectival modification.

- (3.6) 有趣 的 书
yǒuqū de shū
 interesting MFP book
 interesting books

Additionally, it is the particle for forming relative clauses. (Rubin 2002:28)

- (3.7) 你 最 喜欢的 那本 书 卖完了。
Nǐ zuì xǐhuān-de nà-běn shū mài-wán-le.
 you most like-MFP that-CLF book sell-out-PERFASP
 That book that you like most has been sold out.

Rubin (2002:29f) further states that 的 *de* belongs to a closed class. Structurally, it is worth noticing that 的 *de* always immediately follows its complement. Also, 的 *de* does not have any descriptive content.

Another usage of 的 *de* concerns possessives. Rubin (2002) does not treat these along with the other functions. The possessives are formed as follows (Rubin 2002:30):

¹The two graphemes 的/地 *de* are homophones and are treated identical in Rubin (2002). Generally, the character 地 *de* is used in adverbial positions, while 的 *de* is used in adnominal functions.

- (3.8) 张三的 书
Zhāngsān-de shū
 Zhangsan-MFP book
 Zhangsan's book.

Rubin (2002:31) presents the following arguments for positing these and the above functions to be identical. First, Chinese can have multiple possessor phrases, which is why he follows that possessors must be adjuncts and not specifiers of DPs, as their English counterparts are. This is backed by the following example, originally in Tang (1990):

- (3.9) 我的 赵元任的 语言学的 书
wǒ-de Zhào Yuánrèn-de yǔyánxué-de shū
 I-MFP Chao Yuen Ren-MFP linguistics-MFP book
 my linguistics book by Y.R. Chao

Another argument for unifying the two items is that this also entails a simplification of the lexicon.

An argument against the unification is that the possessive formation does not involve predicate intersection, as the other constructions do. Even if these two categories were different, it would not disturb the argumentation in Rubin (2002), because this usage can clearly be argued to be functional.

Discussion Despite the fact that Rubin (2002) does not directly discuss the questionable classifier usages, it is probable that these usages will at least resemble the classifier structures.

What should be kept in mind is the structure proposed in (3.1), because this is what I will use as a basis for analyzing the classifier cases.

The most important feature of the data presented is the ambivalence of the MODP, namely the fact that it hardly exerts any selectional restrictions. The status of the possessive formation is questionable. First, modern theories do not support Rubin (2002)'s argument that specifiers cannot be iterated, because it has been claimed that also specifiers can be multiple. Thus the argument made about the difference between specifiers and adjuncts is invalidated. Also, it is questionable whether the data in (3.9) can support the conclusion that possessive semantics are different to the extent that the author claims, because only the phrase 我的 *wǒ-de* (I-MFP) 'my' is possessive in a strict sense, which gives the impression that Chinese behaves just like English in this respect.

In the following, the structure for nominal usages and the unmarked modification cases presented in the above examples will be assumed to be the same for exploratory reasons. This hypothesis is yet to be falsified.

3.2 What does *de*.MFP Mean in a Classifier Phrase

The presence of 的 *de* in classifier phrases has been reported by many authors to reflect the difference between so-called “measure words” and classifiers in the narrow sense. Among these proposals are Cheng & Sybesma (1999) and Tang (2005), all of them base their observations on Chao (1968). Unfortunately, they leave this important feature at the description stage and do not further acknowledge the fact that the particle 的 *de* actually induces a semantic difference. Below, two articles are presented which discuss the classifier usage of 的 *de* in more detail.

3.2.1 Paris (1981)

Paris (1981)² starts out her treatment of 的 *de* with an interesting judgment. She thinks the fact that the particle does not appear obligatorily between the classifier and the noun is surprising. Only judging from the structural makeup of the phrase, 的 *de* should be expected to appear with all classifiers. The author thus states that 的 *de* is covertly present in every classifier phrase. Compare the following examples (Paris 1981:85f):

(3.10) 一 本 书
 $y\bar{i}$ $b\check{e}n$ $sh\bar{u}$
 one CLF book
 a book

(3.11) (sic!) 一 本 的 书
 $y\bar{i}$ $b\check{e}n$ de $sh\bar{u}$
 one MFP CLF book
 a book

According to the assumption made above, these two examples are the same. Curiously, (3.11) is considered grammatical. My own research of comparable constructions predicts that this form is ungrammatical. The author notes herself that this hypothesis is not tenable in this degree of generality, because the interpretation difference in the following examples would not be explainable.

²Paris (1981) is written in French. Examples are translated by myself.

(3.12) 两 面 镜子
liǎng miàn jìngzi
 two CLF mirror
 two mirrors

(3.13) 两 面(儿) 的 镜子
liǎng miàn(r) de jìngzi
 two side MFP mirror
 a two-sided mirror

(3.14) 三 斤 鸭
sān jīn yā
 three pound duck
 three pound of duck

(3.15) 三 斤 的 鸭
sān jīn de yā
 three pound MFP duck
 (SIC!) a three-pounded duck

(3.16) 三 尺 步
sān chǐ bù
 three foot cloth
 three foot cloth

(3.17) 三 尺 的 布
sān chǐ de bù
 three foot MFP cloth
 (SIC!) a [piece of] cloth that is three foot long

It should be noted that the translation of the last example does not seem to be accurate, it should rather be ‘cloth that is three foot long’ and thus not necessarily imply that it refers to a single piece of cloth. Parallel to this, (3.15) should be translated as ‘three pounds of duck meat’.

In order to capture the examples above, Paris (1981) analyzes them to be instances of relative clauses, of which the predicate has been omitted. Paris (1981) states that also the fact that these phrases can themselves be embedded under a quantifier–classifier–complex, prove that they are relatives.

Paris (1981) cannot predict the presence or absence of 的 *de*, apart from in the following contexts: When the quantifier is 一 *yī* ‘one’, 的 *de* is never possible. This claim contradicts her example (3.11). Also, 的 *de* is impossible with what she calls “strict” classifiers, which refers to Chao (1968)’s individual classifiers.

Discussion Paris (1981)’s contribution is worth mentioning because of the data she discusses. However, she does not systematically cover the interpretation difference induced by 的 *de*, and also neglects that there are cases in which 的 *de* is compatible with the quantifier — *yī* ‘one’, namely in contrastive contexts. The idea that the cases in which 的 *de* makes an interpretation difference may be relative clauses is rather well-received. However, it is not likely if Rubin (2002)’s view is correct. Also, if Paris (1981)’s assumption of a covert appearance of 的 *de* holds true, it remains unclear how any differences between cases with and without the modifying particle would be explained.

3.2.2 Hsieh (2008)

Another perspective on the contexts which govern the appearance of 的 *de* is discussed in Hsieh (2008). She starts out with the assumption that classifiers and massifiers are actually the same in structure, and the difference between count and mass readings lies in the noun itself.

Hsieh (2008) gives several contexts in which 的 *de* is licensed to appear. One of the contexts in which classifier-phrase 的 *de* can always be used is when an approximative quantity or amount is involved, like in the following examples. (Hsieh 2008:36)

- (3.18) 近 一百 位 的 抢救人员
 $jìn$ $yī-bǎi$ $wèi$ de $qiǎngjiù-rényuán$
 close to one hundred CLF MFP rescue-worker
 close to one hundred rescue workers

- (3.19) 好 几百 条 的 海蛇
 $hǎo$ $jǐ-bǎi$ $tiáo$ de $hǎi-shé$
 quite several-hundred CLF MFP sea-snake
 many hundreds of sea snakes

Note that these examples are all results from a corpus study. It has been proposed that these cases might be analyzable as relative clauses, in which the predicate is omitted (cf. Paris 1981). Hsieh (2008) tests this hypothesis with the insertion of the verb 有 *yǒu* ‘have, exist’ but concludes that this is not the correct analysis, because it cannot cover other occurrences of 的 *de* in noun phrases, such as the reduplication cases and cases that do not involve high numbers, which the next examples illustrate (Hsieh 2008:38).

- (3.20) 他 把 一 包包 的 东西 般进 屋里。
Tā bǎ yī bāo-bāo de dōngxi bān-jìn wū-lǐ.
 he PREP one CLF-CLF MFP thing move-into house-in
 He moved a lot of things into the house.

- (3.21) * 他 把 有 一 包包 的 东西 般进 屋里。
Tā bǎ yǒu yī bāo-bāo de dōngxi bān-jìn wū-lǐ.
 he PREP exist one CLF-CLF MFP thing move-into house-in

- (3.22) 他 吃了 三 碗 的 饭。
Tā chī-le sān wǎn de fàn.
 he eat-PERFASP three bowl rice
 He ate three bowls of rice

- (3.23) * 他 吃了 有 三 碗 的 饭。
Tā chī-le yǒu sān wǎn de fàn.
 he eat-PERFASP exist three bowl rice

As was already discussed in several places in this work, also cases where a massifier is used are grammatical with 的 *de* in the majority of cases.

Another condition licensing the use of 的 *de* even with sortal classifiers is when contrastive focus is involved. In these cases, also examples with exact numbers are acceptable. This rule is only violated in cases when 个 *gè*, the most general classifier, is used. The usage of 个 *gè* with the particle 的 *de* is out in “count” as well as “mass” nouns. Note that it is disputed whether Chinese nouns express the mass-count-distinction.

- (3.24) ?? 三 个 的 人
sān gè de rén
 three CLF MFP person
 three people

- (3.25) ?? 三 个 的 沙拉
sān gè de shālā
 three CLF MFP salad
 three salads

The author adopts the explanation by Tang (2005), who claims that this is due to the little information weight of 个 *gè* in examples like (3.24). This is backed by the fact that (3.24) is grammatical if 个 *gè* is exchanged for 位 *wèi*, a classifier exclusively used for human beings.

Another interesting observation is that cases with 的 *de* seemingly cannot be distributed over by the distributive adverb 都 *dōu* ‘all’. Hsieh (2008) does not

explain this phenomenon, but it is possible that this is evidence for her claim. It may be that phrases with 的 *de*, which often denote approximate numbers, just do not have sub-entities that can be subject to the distribution that 都 *dōu* ‘all’ induces. For further discussion of the adverb 都 *dōu* ‘all’ see section 4.2.1.

Summarizing, 的 *de* can appear in the following three circumstances:

1. when a massifier is used
2. when the quantity is non-fixed
3. when there is contrastive focus

From a formal perspective, Hsieh (2008:43) thinks that one of the following two possibilities apply: To her, the NUM-CLF-complex is realized in one constituent, namely #P, as was shown in the structure in (2.73). She predicts #P to be compatible with 的 *de* when the # head is marked with either a [$\pm$ mensural]-feature, expressing that the phrase is massified, or the head is marked [+PL, +IND], which applies when a non-fixed quantity is expressed, or when #P is contrastively focused.

Discussion Apart from the fact that Hsieh (2008) assumes that there is a count-mass distinction in Chinese nouns without evidence to it, she very accurately describes the contexts in which 的 *de* can appear. These are the contexts that the remainder of this work will take into consideration. The solution that she proposes, however, is not very inspired, because features are assumed without independent evidence.

3.3 *De*-modified nominals as bare nouns

Cheng & Sybesma (1998) have claimed that there are principled differences between “classifiers” and “massifiers”, namely in that they are base-generated in different positions, and that they contain a distinct feature-makeup.

Contrary to them, I do not think that there is a structural difference in the lexemes themselves, but that the difference is rather contextually induced. This can be represented in a distributed-morphology kind of framework under the assumption that the same root can be inserted under different functional structures.

One possibility for the structural analysis of 的 *de* is that the structure does not change at all. Other usages of 的 *de* presented for example in Rubin (2002) suggest that this cannot be the case. In other environments, the particle is used as a relative, possessive or adjective marker and thus must be expected to come

with a considerable amount of syntactic re-structuring, so classifier contexts can be expected not to behave any different.

My proposal is that there exist two positions for classifiers to be realized in: first the one between numeral and head noun, secondly, the one realized in a 的 *de*-phrase. If the classifier is realized in the latter position, a distinct meaning can be observed, as can be seen in the following examples:

- (3.26) 三 杯 的 水
 sān bēi de shuǐ
 three glass MFP water
 water as much as three glasses.

- (3.27) 三 斤 的 鸭子
 sān jīn de yāzi
 three pounds MFP duck
 duck as much as three pounds

Note that the above examples without the realization of 的 *de* would be just as grammatical, but they would mean ‘three glasses of water’, or ‘three pounds of duck’. In the examples however, it is not necessary that the glasses of water are actually physically consistent or in one piece, it can just refer to the quantity of three glasses of water. Also the other example behaves alike: as opposed to what Paris (1981) claims, it does not as such refer to a three-pound duck, but rather means “duck meat as much as three pounds”, as if it were used in a recipe. To get the reading that she is referring to, the structure would have to be embedded in another layer of Q-CLF.

A possible structural representation is this: the quantifying expression does not appear in a position c-commanding the head noun, but rather adjoined to it, as suggested in Rubin (2002). This means that the phrases in which 的 *de* appears between classifier and noun are actually not cases of classification. Crucially, this means that the nouns are actually bare nouns, despite the fact that they have classifier preceding them in linear order. Cheng & Sybesma (1999)’s theory, which claims that every Chinese noun has a NUM-CLF-structure preceding it, which may be realized covertly or overtly, would thus need to be tested with these cases.

Interestingly, it has been observed that the presence of 的 *de* yields a kind of “approximate” reading (*cf.* Hsieh 2008). The use of high numbers also favors the grammaticality of 的 *de*. However, this does not apply to every number in the same way, as can be seen in the following examples.

- (3.28) * 两千四百三十一 块 的 石头
 liángqiān-sìbǎi-sānshí-yī *kuài* *de* *shítou*
 2431 CLF MFP stone
 stones as many as 2431

- (3.29) 一千 块 的 石头
 yīqiān *kuài* *de* *shítou*
 1000 CLF MFP stone
 stones as many as one thousand

These examples show that the cases of classifiers with 的 *de* are not instances of counting, but rather a quantificational item implying that the quantity expressed by the noun is big. Counting in the common sense is not possible, as can be seen from the ungrammaticality of example (3.11). It must be added that this is context-dependent: in a contrastive environment, this formulation becomes acceptable. However, the numeral can only be stressed in cases where the quantity is contrasted. As a consequence, this is not a regular classification interpretation, but again an interpretation with the translation ‘stones as many as 2431’.

Because of their resistance to direct counting and the fact that unity of items is not implied in the relevant constructions, I assume that the cases with 的 *de* are mass readings, and that it is this particle that induces the structural possibility for those interpretations, because in this case, no covert structure in the sense of Cheng & Sybesma (1999) needs to appear.

A consequence of this analysis is that the mass-count distinction can be represented in Chinese. A noun governed by a classifier, may it be overt or covert, is interpreted as a count noun. The mass interpretations induced by 的 *de* are analyzed to be adjoined to the noun and thus license it to remain bare. Because the measure cases also exhibit mass interpretations, it will be assumed that these phrases appear not in a position governing the noun, but in a position adjoined to the noun phrase.

3.4 Preliminary Conclusion

This chapter presented data on the particle 的 *de*. The analysis by Rubin (2002) argued that it is an instance of the functional category MOD. Also, it was argued that 的 *de* opens the possibility for a mass interpretation because with the additional modifying structure, it allows for the noun to appear ‘bare’, *i.e.* without the covert numerals and classifiers proposed in Cheng & Sybesma (1999). As a consequence, it is generally proposed to think of mass interpretations in Chinese in terms of bare nouns.

Chapter 4

On Reduplication

Mandarin frequently uses reduplication as a grammatical device. There exist reduplication processes in the verbal, adjectival and nominal domain, the latter group will be discussed here. The objective of this work is to shed light on the semantic content and structure of the reduplications involving classifiers. What follows is the schematic listing of the different kinds of reduplication. In section 4.1, I will discuss some of the more enlightening analyses of classifier reduplication. Section 4.2 presents my own analysis of this phenomenon. However, before I can proceed to the analytic part, the relevant data will be introduced in the examples (4.1) to (4.6). After this, the main research questions will be defined.

1. N-N

- (4.1) 她 天天 都 去 慢跑。
Tā **tiān-tiān** dōu qù màn-pǎo.
She day-day ALL go slow-run
She goes jogging every day.

2. CLF-CLF N

- (4.2) 草地上 朵朵 花 都 很 香。
Cǎodì-shàng, **duǒ-duǒ huā** dōu hěn xiāng.
meadow-on CLF-CLF flower ALL very fragrant
Every flower on the meadow is very fragrant.

3. NUM-CLF-CLF N

- (4.3) 海滩上 他 把 一枚枚 贝壳 打开来
Hǎitān-shàng tā bǎ **yī-méi-méi** bèiké dǎ-kāi-lái
beach-on he PREP one-CLF-CLF shell knock-open-come

看看 里面 有 没 有 珍珠。
kàn-kàn lǐ-miàn yǒu méi yǒu zhēnzhū.
 see-see in-side have not have pearl

On the beach he knocked open a lot of shells to see whether there was a pearl inside.

4. NUM-CLF NUM-CLF N

(4.4) 每 天 有 一辆 一辆的 车 过 这座
Měi tiān yǒu yī-liàng yī-liàng-de chē guò zhè-zuò
 every day have one-CLF one-CLF-MFP car cross this-CLF
 桥。
qiáo.
 bridge

One car after the other crosses this bridge every day.

5. NUM-CLF PARTICLE NUM-CLF N

(4.5) 奥运会上 中国 运动员 夺-得-了
Àoyùnhuì-shàng Zhōngguó yùndòng-yuán duó-dé-le
 Olympic.games-on Chinese sport-person snatch-get-PERF
 一块 又 一块 的 金牌。
yī-kuài yòu yī-kuài de jīn-pái
 one-CLF PART one-CLF MFP gold-plate

At the Olympic games the Chinese athletes snatched one gold medal after the other.

6. NUM-CLF N NUM-CLF N

(4.6) 一个 学生 一个 学生 进 教室。
Yī-gè xuéshēng yī-gè xuéshēng jìn jiàoshì.
 one-CLF student one-CLF student enter classroom

One student after the other enters the classroom.

The examples above present a number of different collocations. We can see a “bare reduplication”, where only one constituent is doubled, in (4.1), a reduplication that applies only to the classifier in (4.2). This form can also appear with a numeral, as (4.3) shows. It is also possible that a numeral *and* a classifier is doubled, as can be seen in (4.4) and (4.5). Even full NUM-CLF-N-phrases can be reduplicated, as example (4.6) shows.

It is unlikely that all of these sentences are independent forms, so it is a plausible expectation that some of them will pattern together syntactically as well as semantically.

A crucial task of this work will thus be to find out what different interpretations exist for classifier reduplication. What we can see in the examples is at first sight a kind of universal quantification reading in example (4.2), example (4.3) displays a kind of plural reading, and in (4.4) (4.5) and (4.6) we see the phrase with the classifiers means ‘one after the other’. These basic observations will be much refined in the subsequent analysis in section 4.2.

A question that will need to be answered concerns the relation of these patterns with respect to each other: It will have to be found out whether all these structures result from the same process. In order to do so, the similarities and distinctions concerning form, function and interpretation of the reduplications will have to be considered. This will be evidence for the analysis as distinct processes, as they exhibit substantial formal and interpretational differences. However, the reduplications have some common semantic ground in that all of them will be shown to introduce distributivity in some sense.

Again, the particle 的 *de* will play a relevant role also in this discussion. As was discussed in section 3, this particle induces considerable changes in structure. In the preceding section it was argued that 的 *de* selects the mass noun reading for a noun. This is also the case in reduplication contexts.

So far, I have introduced the objective for this thesis and the phenomena I want to discuss. In the next section I will review the existing literature to see what answers to these questions other scholars proposed.

4.1 Previous Analyses

4.1.1 Yang (2002): Findings of a Corpus Study.

One Chinese study by Yang (2002) deals with the relative frequencies of the three classifier usages 个个 *gè gè* ‘CLF CLF’, 每个 *měi gè* ‘every CLF’ and 一个个 *yī gè gè* ‘one CLF CLF’. This means that her work is not a study on reduplication patterns in general, but it only deals with reduplications and quantifications of the default classifier 个 *gè*. The article is a corpus analysis of 20 million characters, consisting of newspaper articles and literary work.

Yang (2002) attempts to find out in which positions which constituents are most likely to appear, and which meanings they represent. She also compares contemporary results to those of historic corpora, including texts dating back as far as the 唐 *Táng*-dynasty (613–907) and representative texts of all the following dynasties. This is a clear methodological problem of the analysis, because no theory for the

relation between diachronic and synchronic processes is even mentioned, much less discussed. Additionally, these data are irrelevant for the current discussion and thus will not be dealt with here.

The findings of this analysis are as follows: 个个 *gè gè* ‘CLF CLF’ normally appears as the subject of the sentence. Yang (2002) has a rather imprecise notion of subjecthood. What she means by it is what may be called “preverbal position”. In the cited examples often there is an NP preceding 个个 *gè gè* ‘CLF CLF’ or the reduplication is contextually licensed by a preceding clause. It barely appears in a position modifying nouns, and it only appears on its own when discursively licensed.

In absolute numbers, this means that 个个 *gè gè* ‘CLF CLF’ is preceded by a topic in 220 of 223 cases, and in the remaining 0,89% it appears in a position preceding a noun. It is noted that the verbs following the 个个 *gè gè* ‘CLF CLF’ construction in subject positions are normally not action verbs, but rather stative verbs or 成语 *chéngyǔ*, i.e. idiomatic literary quotations.

每个 *měi gè* ‘every CLF’ can be an attributive modifier and sometimes a subject. Yang (2002) claims this reading stresses the single entities in the noun phrase. 每个 *měi gè* ‘every CLF’ does appear in a position immediately preceding nouns, only in 1% of all cases does it appear on its own without an NP. A typical usage in which 每个 *měi gè* ‘every CLF’ appears without a noun is the following (Yang 2002):

- (4.7) 每 个 165 元
 Měi gè 165 yuán
 Every CLF 165 RMB
 Every piece costs 165 RMB

Yang (2002) explains the difference in meaning of the two forms 每个 *měi gè* ‘every CLF’ and 个个 *gè gè* ‘CLF CLF’ as follows. In subject position, 每个 *měi gè* ‘every CLF’ highlights the individual members of a set. 个个 *gè gè* ‘CLF CLF’ on the other hand indicates that the whole set is composed of individual members.

She continues by comparing the sequence 一个一个 *yī gè yī gè* ‘one CLF one CLF’ and 一个个 *yī gè gè* ‘one CLF CLF’. In 84% of all cases in her corpus, the former is an adverbial adjunct, the latter usually appears as a nominal modifier.

Their meaning differs in the following way: 每个 *měi gè* ‘every clf’ has a “one after the other”-reading, while 个个 *gè gè* ‘CLF CLF’ indicates numerosity.

She quotes Lu (1986) in saying that 一个个 *yī gè gè* ‘one CLF CLF’ and 个个 *gè gè* ‘CLF CLF’ can normally be interchanged, but still exhibit differences in three environments.

1. There are differences in the accent: in sentences with 一个个 *yī gè gè* ‘one CLF

CLF’, the following verb bears the accent, whereas in sentences with 个个 *gè* *gè* ‘CLF CLF’ it is the constituent itself that bears stress.

2. In a question sentence, the phrase 是不是 *shì bù shì* ‘is it the case that’ marking the question can be placed before and after 一个个 *yī gè gè* ‘one CLF CLF’, but only before 个个 *gè gè* ‘CLF CLF’.
3. The same distribution holds for the conjunction 虽然 *suīrán* ‘despite’. Just like 是不是 *shì bù shì* ‘is it the case that’, it can also only appear before 个个 *gè gè* ‘CLF CLF’, but before and after 一个个 *yī gè gè* ‘one CLF CLF’.

If the predicate is an action verb, the phrase 一个个 *yī gè gè* ‘one CLF CLF’ immediately preceding the verb will be understood to be descriptive of the manner of the predicate.

If 一个个 *yī gè gè* ‘one CLF CLF’ appears immediately preceding a noun, it yields the interpretation that “the number of items is big”. Yang (2002)’s results can be summarized as follows: *gè gè* ‘CLF CLF’ is normally used in a position immediately preceding the verb with a topicalized noun before it, expressing the meaning “generally” or “all”. 一个个 *yī gè gè* ‘one CLF CLF’ is usually an attribute to a noun, and is in some cases also used as a subject meaning “every single one”. *yī gè gè* ‘one CLF CLF’, means “one after the other”, it only has this interpretation when used in adverbial position, but it can also express the meaning of “every single one”, as well as “a lot”

This article, despite the fact that it presents a lot of interesting data leaves a lot of questions open. Unfortunately it doesn’t deal with cases found in postverbal position and their semantics. An additional problem is that it only covers the standard classifier 个 *gè*, which is expected to behave different from other classifiers with more lexical content, as is even predicted by Yang (2002) herself. One of the reasons for this is that this classifier has little semantic restrictions and can thus be combined with a non-uniform group of nouns. The work about 个 *gè* is complicated by a nearly homophonous quantifier 各 *gè* ‘every’, which makes it difficult to separate the readings from each other.

What should be kept in mind is Yang (2002)’s observation regarding the 一个一个 *yī gè yī gè* ‘one CLF one CLF’-type of reduplications, namely that it does often occur in adverbial position. Also her statement about the reduplications and their sensitivity to verb type proves to be very relevant.

4.1.2 Paris (2007)

In the following, I will briefly discuss the basic observations made in Paris (2007) and introduce my criticism about some claims therein, which will be elaborated in the following sections.

Paris (2007) tries to show that Mandarin reduplication obeys syntactic rules. The criteria that she considers are syntactic positions, semantic interpretations and pragmatic meaning of the constructions in question. She distances herself from the popular view that reduplications are “expressive” or “iconic” forms, because they are constrained by clear syntactic, semantic and morphophonological rules.

Paris (2007:1)’s central claim is that in the nominal domain the reduplications generally have to encode what is in the Indo-European languages covered by the plural marking. Despite some interesting observations that she presents in the remainder of her paper, this claim does not hold to this degree of generality and must therefore be refined.

For Paris (2007), reduplication in the nominal domain is a process that has a left-to-right-directionality, which she claims to be the natural cognitive order. Its semantic function is to create a complex or plural unit out of a singular one. The constituents that can be reduplicated are the sequences $\langle Q-CLF \rangle$, $\langle CLF \rangle$ or $\langle N \rangle$. (Paris 2007:5)

According to form and position, the quantification of the constituents is distributive or collective, and can also express a temporal dependency, namely successivity. She relates the sensitivity to structural position to a general property of Mandarin Chinese, namely that preverbal bare nouns are generally definite, postverbal ones are indefinite. Reduplication in the preverbal position corresponds to a distributive/definite reading, in postverbal position, an indefinite/collective reading is assigned. For her, this is the reason why the adverb 都 *dōu* ‘all’ can only appear with reduplicated constituents in preverbal position. (Paris 2007:6)

The reduplications of the form $\langle CLF CLF \rangle$ always have a plural reading, but they seldom and only under certain conditions appear postverbally. Paris (2007:6) thinks this is due to the fact that only such pluralities which don’t consist of atomic individuals can appear there, those that consist of atomic individuals are banned. Paris (2007:9) mentions that this form of reduplication must always be grounded in a context introducing the constituent.

Reduplications of the form $\langle yī CLF CLF N \rangle$ and $\langle yī CLF yī CLF N \rangle$ behave identically and are thus treated as the same group. Both structures are distributive and imply a temporal succession. Differences according to the position in the sentence

are not observed in the description of this structure. (Paris 2007:7)

Paris (2007) gives us some interesting generalizations, and thus her work is very valuable. Partly because of the briefness of her account there still exist reasonable doubts about some of her claims. From a semantic as well as syntactic point of view, her claim that Mandarin classifier reduplication fulfills the same purpose as Indo-European plural marking, is highly disputable.

The meaning of Indo-European type pluralizations is to indicate a cardinality of items is bigger than one. Chinese classifier reduplication normally denotes only higher cardinalities, namely those bigger than what is countable for the speaker. Thus, it cannot be applied when the cardinality is as low as for example two. Also Paris (2007) mentions that classifier reduplication in postverbal position does not work with entities where the individuals are clearly separable or distinguishable. It is almost a hallmark of the pluralization operation in Indo-European languages that they do *not* allow for pluralization when the noun is not conceptualizable as individual entities. This can be seen by the ungrammaticality of mass plurals or plurals of abstract nouns. The fact that exactly the opposite case is true for Mandarin shows us how different plural formation in Indo-European languages is from what happens in classifier reduplications. The exact nature of this will be discussed further in chapter 4.2.2.

Another difference between the Indo-European-type plural and Chinese classifier reduplication is their role in their respective languages. An Indo-European type plural is obligatory in all cases where a noun is to be interpreted as plural. In Mandarin, this is not the case. Nouns in which the singular property has not been made overt can easily be interpreted as plural, also without plural marking.

Also, not all of Paris (2007)'s observations hold. In her description, the reader is brought to think that the interpretation is universally dependent on the position of the reduplication with respect to the verb. As a consequence it should be expected that the sequence $\langle y\bar{i}$ CLF $y\bar{i}$ CLF N $\rangle$ obtains a collective interpretation in the postverbal position. In fact, this prediction is not borne out by the data, the construction in question seems to be inherently distributive, whatever the location. However, this is not true for $\langle y\bar{i}$ CLF CLF N $\rangle$. Paris (2007)'s claim that these two belong to the same group and behave the same must thus be considered wrong.

Paris (2007) tries to unify the different meanings that reduplications can obtain with the well-known observation that Mandarin nominals obtain a different interpretation according to their position in the sentence. She does exemplify this with

a few sentences, but she doesn't actually prove that this is the case for all the patterns found. Also, it is questionable whether reduplications of type $\langle \text{CLF CLF} \rangle$ can actually be considered plural in the common sense. It should be tested with which kinds of predicates they can cooccur.

4.1.3 Hsieh (2008)

Hsieh (2008)'s work generally deals with the structure of the Chinese noun phrase. Consequently, she discusses many issues relevant to this topic here. In passing, she also covers reduplication patterns. She takes her data from the Academia Sinica-corpus. She discusses two patterns in greater detail:

1. The CLF-CLF-pattern

This pattern is marked for singular number and has a distributive interpretation.

2. The $y\bar{i}$ -CLF-CLF-pattern

This pattern is marked plural and indefinite. It is created in the lexicon, because only one numeral, namely $y\bar{i}$ 'one' appears in this form.

Unfortunately, she only uses these patterns as evidence for other questions, and thus does not provide a proper structural analysis. She also uses the NUM-CLF-NUM-CLF-type in examples, but does not provide an analysis for them in the text. Also, she claims that the number $y\bar{i}$ 'one' is omissible when it appears in specific contexts. This implies that the patterns presented above are either transformable into each other, or not distinct in general. Thus, it seems her treatment of $y\bar{i}$ 'one' still lacks some detail.

4.2 Types of Classifier Reduplication Constructions

In the following section, I will propose my own analysis for Chinese classifier reduplications. I will start out from grouping together the different patterns they appear in, and considering this, analyze their syntactic and semantic behavior. Three distinct groups will be analyzable, divided into the patterns:

(a) CLF CLF N

(b) $y\bar{i}$ 'one' CLF CLF N

(c) NUM CLF NUM CLF N

As can be seen, they differ considerably in form, as some of them involve classifiers, some both classifiers and numerals. It will be shown that they are composed rather differently. The reduplication in (a) will turn out to be purely morphological in origin, while the other processes (b) and (c) are syntactically derived. All the three processes also differ in their readings, as will also be discussed in the chapter to come.

I try to keep the variation in the examples as little as possible, this is why many of the sentences below will be derived from cases like the following:

- (4.8) 狼 吃 了 一 只 小鸭。
Láng chī le yī zhī xiǎoyā
 wolf eat PERFASP one CLF little duck
 The wolf ate a little duck.

- (4.9) 三 只 小鸭 过 河。
Sān zhī xiǎoyā guò hé
 three CLF little duck cross river
 Three little ducks cross the river.

As already discussed above, every Chinese noun phrase must be preceded by a classifier, if it is overtly quantified in any way. Note that the above examples were chosen for the following motives. First, I don't want to deal with cases including the default classifier 个 *gè*, because it does not always behave regular. Unlike other classifiers, it can never be ambiguous between a mass and a count reading, but is invariably count. Also, it does exert much less restrictions on the nouns it governs. Additionally, a phonologically very similar quantifier 各 *gè* 'every' exists, which is easily to be confused. Secondly, I chose little ducks because they allow for many different readings: they can appear singly or in a group, *etc.* Last but not least, the examples were given to me by a speaker. The data presented in this analysis stems mainly from my own empirical work with informants.

4.2.1 The CLF-CLF-N-Type

One of the distinctions in the reduplication patterns observed is that some of the reduplicated classifiers have a numeral intervening between them, and some do not. Those which do not are further divided into two groups: those with a numeral preceding, and those without. It is intuitively understandable that the pattern involving less different constituents may be the less complicated one, in the sense

that the behavior of less different constituents needs to be considered, which is why I would like to start from there. Under these conditions, we come across examples like the following.

- (4.10) 只只 小鸭 都 很 饿。
Zhī-zhī xiǎo-yā dōu hěn è.
 CLF-CLF little-duck ALL very hungry.
 Every little duck is hungry.

It will be shown in this section that the reduplication has the interpretation “every single N”. It obligatory occurs with the distributive adverb 都 *dōu* ‘all’. Thus, distributivity will be a big topic. Increased attention will have to be directed to the properties of the adverb. It will be shown that the reduplication shares many semantic traits with the adverb, one of them being sensitivity to verb type. Syntactically, it will be shown that despite the fact that the reduplication is made up from classifiers, it does not assume a classifying function. The number interpretation as well as the impossibility of the classifier to cooccur with other quantifiers will be used as evidence in this question. These points all point to the fact that the CLF-CLF-N-type of reduplication actually is a quantificational DP.

4.2.1.1 Semantic Behavior

It can be seen that the subject phrase is no longer interpreted like the simplex sentences presented above, but the quantification changed, now meaning ‘every single N’.

It seems that almost all of the cases encountered involve the adverb 都 *dōu* ‘all’. We also witnessed this in the introductory example (4.2), here repeated as (4.11)

- (4.11) 草地上 朵朵 花 都 很 香。
Cǎodì-shàng, duǒ-duǒ huā dōu hěn xiāng.
 meadow-on CLF-CLF flower ALL very fragrant
 Every flower on the meadow is very fragrant.

It is important to note that this type of reduplication is ungrammatical in object position. Thus, (4.12) is ungrammatical.

- (4.12) * 狼 都 吃了 只只 小鸭。
Láng dōu chī-le zhī-zhī xiǎo-yā
 wolf ALL eat-PERFASP CLF-CLF little-duck
 Intended meaning: The wolf ate every little duck.

Another constraint concerns the types of verbs that appear with this reduplication. It seems only non-eventive predicates are grammatical with this reduplication, so the following sentence is rather unacceptable.

- (4.13) # 本本 书 都 掉下来。
Běn-běn shū dōu diào-xià-lái
 CLF-CLF book ALL fall-down-come

Intended meaning: Every book came falling down.

I would like to mention that the two limitations I just discussed, namely the fact that the action verbs cannot take this kind of reduplication as an internal argument and that it cannot appear in object position may just be two sides of one coin, seeing as many verbs that take objects are action verbs.

The concurrence of these reduplications with 都 *dōu* ‘all’ requires some explanations about this item. This adverb has been the object of quite a number of studies concerning Chinese nominals. One of the more indepth studies is the one by Lin (1998) which treats the adverb from a syntactico-semantic perspective. In this paper, 都 *dōu* ‘all’ is analyzed to be the spell out of the distributive operator, which is assumed to appear in all distributive readings at LF (Link 1987). Lin (1998:202) gives the following example for distributive readings:

- (4.14) 我们 合用 一 个 厨房。
Wǒmen hé-yòng yī ge chúfáng
 we together-use one CLF kitchen

We share a kitchen.

- (4.15) 我们 都 合用 一 个 厨房。
Wǒmen dōu hé-yòng yī ge chúfáng
 We ALL together-use one CLF kitchen

We each share a kitchen with someone else./ All of us share a kitchen.

The interpretative difference between (4.14) and (4.15) is the following: In (4.14), it is the case that there exists one kitchen, and all of us share this kitchen. In sentence (4.15) however, all of us individually have the property of being kitchen-sharers. This is an instance of a distributive reading. To put this in a more abstract manner, one can say that the property expressed by the verb holds for every single member of the subject group individually, not just for the group itself. Lin (1998:205) models the distributive operator in this way, closely following Link (1987):

$$dōu \Rightarrow \lambda P \lambda X \forall y [y \in X \rightarrow P(y)], \text{ where } P \in D_{\langle e, t \rangle}$$

What this means is that there is a property P , which is of the type $\langle e, t \rangle$, and there is a plurality X , and for all y that belong to this plurality X , P applies.

都 *dōu* ‘all’ also has some further syntactic restrictions: one of them is that it can only distribute over DPs that assume a position before the verb. This can be seen from the following opposition (Lin 1998:206).

- (4.16) * 我 都 看过 那些 书。
 Wǒ dōu kàn-guo nà-xiē shū
 I ALL read-ASP those book
 Intended interpretation: I read all of those books.

- (4.17) 那些 书, 我 都 看过。
 nà-xiē shū wǒ dōu kàn-guo
 those book I ALL read-ASP
 I read all of those books.

The two sentences above are the same, except for the fact that in (4.16) the object is realized in its base position, we get simple S–V–O word order. This is ungrammatical because 都 *dōu* ‘all’ requires a plural constituent to appear before it that can be distributed over. In (4.16) however, the only plural N appears after the verb, rendering the sentence unacceptable. (4.17)’s only difference from (4.16) is that the plural constituent is topicalized before the verb, rendering this sentence grammatical. Another interesting attribute of 都 *dōu* ‘all’ is that it goes better with non–eventive verbs, as does the reduplication.

It is very interesting to see that the CLF–CLF– N –type reduplication and the distributive operator 都 *dōu* ‘all’ seem to have so much in common. They both exert restrictions on the verb type they can be combined with. Also, both of them are associated to certain structural positions, namely those before the verb.

This is more than just a coincidence. The data suggest that the CLF–CLF– N –type reduplication and the usage of 都 *dōu* are two expressions of the same property, namely distributive semantics of the noun phrase. I think of 都 *dōu* ‘all’ in terms of a distributivity agreement morpheme that has to mark the verb whenever something distributive has moved past it. This refers to the way that Lin (1998) models 都 *dōu* ‘all’. It can only bind a trace within the verbal phrase, which is the reason why post–verbal constituents cannot be distributed over.

Now that I have discussed what 都 *dōu* ‘all’ does, let’s get back to the reduplication. Judging from what we’ve seen so far, the reduplication is a determiner, triggering a distributive universal–quantification meaning of the type ‘every single X ’. In order to test whether this is a quantifier, scopus effects should be detectable.

The analysis as distributive universal quantifier relates this data to the analysis in Beghelli & Stowell (1997). There, it is proposed that different types of quantifiers get raised to different positions at LF. This analysis gives the prediction that not all scopal relationships are possible, but that some quantifiers are more likely to take narrow scope than other. Interestingly, also data is cited from languages where universal distributive phrases get raised on PF. This may be the case for Chinese as well in order to account for the fact that the reduplication cannot occur in object position.

4.2.1.2 Syntactic Behavior

Let's now turn to the syntactical properties of the CLF–CLF–N–type of reduplication. It seems somewhat peculiar, but despite the fact that this reduplication only involves classifiers, it does not actually assume classifier function. I will illustrate this with some basic observations in the section to come. Also, this serves as evidence in order to propose a structural representation for this reduplication.

First, the denotation of the phrase is not unambiguously singular. A classifier phrase itself is never plural, but always creates the cardinality 1. There may be one exception to this rule, namely the plural marker 些 *xiē*, as can be seen in phrases like the following:

- (4.18) 一些 小鸭
 yī-xiē xiǎo-yā
 one-PL little-duck
 some little ducks

On the surface, it looks like a plural classifier. However, it does not behave like one. 些 *xiē* can cooccur with just any noun, but what makes the special property of a classifier is that there is a limited group of nouns that it can be combined with. One may now ask about the general classifier 个 *gè*, which can also appear with almost any N. Still, *almost* is the operative word in this case, blatant classifier mismatches like *一个狗 *yī gè gǒu* (one CLF dog) ‘one dog’ are generally not accepted. At most, it occurs in children's speech. In this thesis, obviously what has to be checked is whether 些 *xiē* is reduplicable. It turns out not to be:

- (4.19) * 一 些 些 小鸭
 yī xiē xiē xiǎo-yā
 one PL PL little-duck

(4.19) is highly ungrammatical, showing that 些 *xiē* is not a classifier.

Turning back to the syntactic properties of the CLF–CLF–N–type of reduplication: it should be sufficiently established by now that classifiers are not plural, which points us into the direction that the reduplication is not a classifier.

Another indication is the use of numerals. It is interesting to see that the CLF–CLF–N–type of reduplication doesn't require a numeral. Example (4.20), the repetition of example (4.10), compares it to its simplex counterpart.

- (4.20) 只只 小鸭 都 很 饿。
Zhī-zhī xiǎo-yā dōu hěn è.
 CLF-CLF little-duck ALL very hungry.
 Every little duck is hungry.

- (4.21) * 只 小鸭 很 饿。
Zhī xiǎo-yā hěn è.
 CLF little.duck very hungry.

The important feature that this example points out is that a bare classifier can never occur in sentence-initial position in Mandarin Chinese.¹ The reduplication can do so and thus does not behave like a classifier. It may be criticized that the two examples are not exactly minimal pairs, as the second sentence lacks the adverb 都 *dōu* 'all'. As was shown in the examples (4.16) and (4.17), 都 *dōu* 'all' requires a plural antecedent. It has also already been noted that a classifier without any further determination is interpreted as singular. The undetermined usage is only possible in postverbal position, but there, the cardinality of the classifier is interpreted as 1.

A typical feature of classifiers is that they are usually obligatory when a numeral is used. And yet the reduplication combined with a numeral is ungrammatical.

- (4.22) * 两 只只 小鸭
liǎng zhī-zhī xiǎo-yā
 two CLF-CLF little-duck

Evidently, a contradiction seems to arise, because the number 一 *yī* 'one' can be combined with the reduplication. In many contexts however, 一 *yī* 'one' is a marker of indefiniteness, and not a numeral in a quantificational sense. It can be used with the reduplication in its indefinite function. Numerals that do not bear any functional load, namely every numeral apart from 一 *yī* 'one', cannot cooccur with this type of reduplication.

Summing up, the arguments from number and numeral usage against the classifier status of the reduplication are multiple. Not only does it have a plural reference,

¹It can be used this way in other Sinitic languages, as pointed out by Cheng & Sybesma (1999, 2001)

when classifiers in isolation are normally singular, but it also does not require any antecedent in sentence-initial position. Even more, it cannot be preceded by a typical classifier antecedent, a numeral. This last fact will serve us as evidence in order to determine the structural representation of the CLF–CLF–N–type of reduplication.

Another group of arguments comes from distributional evidence. A sortal classifier can appear embedded in a group classifier phrase. (4.23) represents this usage. For a definition and further discussion of the differences between types of classifiers please refer to section 2.3.

- (4.23) 一 群 八 只 的 小鸭
 yī qún bā zhī de xiǎo-yā
 one CLF-herd eight CLF MFP little-duck
 a duck flock consisting of eight little ducks

The corresponding usage with the classifier reduplication replacing either of the classifiers above is ungrammatical.

- (4.24) 群 (*群) 只 (*只) 的 小鸭
 qún (-qún) zhī (*-zhī) de xiǎo-yā*
 CLF.herd CLF.herd CLF CLF MFP little-duck

This proves that the classifier reduplication can not only not take the position of a sortal classifier, but can also not function as a group classifier.

We have already seen above that the CLF–CLF–N–type of classifier reduplication cannot cooccur with a numeral. Also another typical position for classifiers, namely the one after demonstrative pronouns, is excluded, as is shown in (4.25). The pronouns 这 *zhè* ‘this’ and 那 *nà* ‘that’ cannot precede the reduplication.

- (4.25) *这/*那 只只 小鸭
 **zhè/*nà zhī-zhī xiǎo-yā*
 this/that CLF.CLF little-duck

Again, the reduplication can not assume a position that is typical for classifiers. It may be that the reduplication itself occupies the position in which we expect to find a pronoun.

In addition to the pronoun, the reduplication cannot be preceded by or cooccur with any other quantifier. Note that there are different types of quantifiers in Chinese, some which require a classifier after itself, some which optionally allow for one, and some which exclude classifier usage. The respective examples of the different types of quantifiers are the following, as in the phrase

(4.26) 每 *měi* ‘every’

每只 小鸭
měi-zhī *xiǎo-yā*
 every-CLF little-duck
 every little duck’

(4.27) 任何 *rèn hé* ‘whichever’

任何 一只 小鸭
rèn hé *yī-zhī* *xiǎo-yā*
 whichever one CLF
 whichever of the little ducks

(4.28) 很少 *hěn shǎo* ‘few’²

很 少 小鸭
hěn shǎo *xiǎo-yā*
 few little-duck
 few little ducks

The classifier reduplication can not cooccur with any of those quantifiers, as is shown below.

(4.29) 每只(*只) 小鸭
*měi-zhī(-*zhī)* *xiǎo-yā*
 every.CLF.CLF little-duck
 every little duck

(4.30) 任何 一 只(*只) 小鸭
rèn hé *yī* *zhī(-*zhī)* *xiǎo-yā*
 whichever one CLF-CLF little-duck
 whichever of the little ducks

(4.31) 很 少 (*只只) 小鸭
hěn shǎo (**zhī-zhī*) *xiǎo-yā*
 few CLF-CLF little-duck
 few little ducks

²I am aware of the fact that my gloss indicates that 很少 *hěn shǎo* ‘few’ consists of two morphemes. The morpheme 很 *hěn* is difficult to translate because it has to precede adjectives in certain positions, but does not add very much to the meaning. It is often translated as ‘very’, which is not always accurate. It marks an adjective in its positive form. Unmarked adjectives are interpreted as comparative.

From a syntactic point of view, the CLF–CLF–N–type of reduplication behaves like a quantificational DP. It resembles the quantifier *hěnn duō* ‘many’ in distribution.

Hsieh (2008) analyzes the quantifiers 每 *měi* ‘every’ and 任何 *rènhé* ‘whichever’ to appear in the specifier of #P, *i.e.* the numeral phrase. Because the reduplication cannot cooccur with these, this is also where its structural position is.

4.2.1.3 Caveat

The attentive reader might have noticed that example (4.1) was not yet discussed. Sure enough, it resembles the cases above a big deal. However, I do not want include it in the analysis. In this section, the reasons why are presented. This reduplication does not involve classifiers. This is not an undisputed claim, because there exist cases in which the word in question, 天 *tiān* ‘day’ is used as a classifier and reduplicated, like (4.33) below.

- (4.32) 一 天 倒霉
yī tiān dǎo-měi
 one day fall-mold
 one day of bad luck

- (4.33) 天 天 倒霉
tiān tiān dǎo-měi
 day day fall-mold
 be out of luck day after day

It can be shown that 天天 *tiān-tiān* ‘day after day’ is not a case of classifier reduplication because it has a different structure compared to a case like (4.2). A phrase like (4.33) consists of an adverbial 天天 *tiān tiān* ‘day after day’ and a verb 倒霉 *dǎo-měi* ‘be out of luck’. So you can say

- (4.34) 他 天 天 倒霉
Tā tiān tiān dǎo-měi
 he day day fall-mold
 He is out of luck day after day

but you could never use the reduplicated classifier phrase in (4.2) as a predicate, so a sentence like (4.35) does not make any sense at all.

- (4.35) * 草地 朵 朵 香
cǎodì duǒ duǒ xiāng.
 meadow CLF CLF fragrant

Intended meaning: On the meadow, every flower is fragrant.

Additionally, the phrase 天天 *tiān tiān* ‘day after day’ is lexicalized, there are only very few other examples of this kind of reduplication, all highly lexicalized themselves, e.g. 人人 *rén-rén* ‘every single person’.

Crucially, not just every noun can be reduplicated. Thus a reduplication *猫猫 *māo-māo* ‘cat-cat’ with the intended meaning ‘every cat’ is unacceptable. What shows the ungrammaticality even better is a disyllabic noun. *汽车汽车 *qìchē qìchē* ‘car car’ is just ungrammatical and can never mean anything like ‘every car’, despite the fact that you can even use it in a seemingly measuring position, as in 一汽车的人 *yī qìchē de rén* ‘a car full of people’.

I do not want to claim that parallels between the reduplications are a coincidence. Probably they are formed by analogy. However, it is not obligatory that all of my conclusions for the CLF–CLF–N-type of reduplication also hold for the N–N-type.

4.2.1.4 Summary

The above argumentation showed that the CLF–CLF-type of reduplication expresses distributive universal quantification. This was argued because of its obligatory co-occurrence with the adverb 都 *dōu* ‘all’. As a consequence, the structure assumed is that of a quantificational determiner.

4.2.2 The *yī*–CLF–CLF-Type

This section deals with another pattern of reduplication, possibly related to what we have seen so far in part 4.2.1. It is not implausible to think that the *yī*–CLF–CLF-type of reduplication is a CLF–CLF-reduplication, prefixed with the numeral 一 *yī* ‘one’.

It will be shown that this reduplication bears a kind of plural reading, which is still distinct from what is plural in Indo-European languages in that the quantity expressed remains vague. This touches on the issue of pluralizations of mass nouns, which will also be discussed. For comparison, another type of plural morphology in Mandarin Chinese will be mentioned briefly. Syntactically, the status of the numeral 一 *yī* ‘one’ will be a major question. It will be argued that it is ambiguous between a quantificational device and an indefinite article. On these grounds, a syntactic structure will be proposed.

4.2.2.1 A First Assessment

Consider the following example:

- (4.36) 一只只 小鸭 在 我 面前 过 河。
Yī zhī-zhī xiǎo-yā zài wǒ miàn-qian guò hé.
 one CLF-CLF little.duck PREP I face-before cross river
 A lot of little ducks crossed the river in front of my eyes.

We can see that the sequence 一 *yī* ‘one’-CLF-CLF appears in a position preceding the verb. This changes the denotation of the noun phrase from ‘little duck’ to ‘a lot of little ducks’. Paris (2007) terms this reading “collective reading”. This term does not seem to be the right choice, because it is associated with collective predicates or collective as opposed to distributive. Thus, in this work I will rather call this a “collective plural”-reading. Let me now indicate why 一 *yī* ‘one’ does not function as a numeral here. If it were a numeral (*i.e.* a device for counting), the following example would be expected grammatical:

- (4.37) * 两只只 小鸭 在 我 面前 过 河。
Liǎng zhī-zhī xiǎo-yā zài wǒ miàn-qian guò hé.
 Two CLF.CLF little-duck PREP I face-before cross river

一 *yī* ‘one’ can also be used as a numeral, as the following example demonstrates:

- (4.38) 一 加 一 等于 二。
Yī jiā yī děngyú èr.
 1 plus 1 equal 2
 One plus one equals two.

In many cases, it is also used as a grammatical marker for indefiniteness, as it happens in many languages (Dryer 2008). If it bears this grammatical function, it loses its singular meaning. Thus, 一 *yī* ‘one’ can also appear in plural contexts like the following:

- (4.39) 一些 小鸭
yī-xiē xiǎo-yā
 one-PL little-duck
 some little ducks

This seems a little evocative of the following English and German constructions:

- (4.40) *a few, a little*

The English and Chinese example resemble each other because in both of them it seems there is an unambiguously singular constituent, but the interpretation of the phrase is still plural. A difference however lies in the fact that the post-determiner

constituents in the English example has more of a lexical interpretation and can also be used in adjectives, whereas the Chinese 些 *xiē* only appears in post-determiner position.

This means that 一 *yī* ‘one’ stands in opposition with demonstrative pronouns like 这 *zhè* ‘this’ or 那 *nà* ‘that’, as is shown below. Lü (2004) argues that these cases were diachronically derived from the form 这一些 *zhè yī xiē* ‘this one PL’.

- (4.41) 这些/那些 小鸭
 zhè-xiē/nà-xiē *xiǎo-yā*
 this-PL/that-PL little-duck
 these/those little ducks

It is important to know that the *yī*-CLF-CLF-type of reduplication is not judged grammatical by all speakers in postverbal position. This affects sentences like the following:

- (4.42) ? 我 看到了 一 只只 小鸭。
 Wǒ kàndào-le *yī* *zhī-zhī* *xiǎo-yā*.
 I see-PERFASP one CLF-CLF little-duck
 I see a lot of little ducks.

The classification in CLF-CLF-N-type and *yī*-CLF-CLF-N-type exhibits some fuzziness in postverbal positions.³ There exist cases of CLF-CLF-N-type reduplication that appear in postverbal position, which were claimed not to exist in section 4.2.1. The reason for doing so was that I only considered distributive readings with 都 *dōu* ‘all’. The problematic examples exhibit the collective plural reading, which is typical for the *yī*-CLF-CLF-N-type of reduplication. Hsieh (2008:3) gives the following example from the Academia Sinica-corpus:

- (4.43) 一 块 贫瘠 及 乏人 呵护 的 园地, 能 开出
 yī kuài pínjí jí fá rén hēhù de yuándì, néng
 one CLF barren MFP and lack care MFP land can
 朵朵 健康 的 花蕊 ...
 kāi-chū duōduō jiànkāng de huā-ruì ...
 grow-out CLFCLF healthy MFP flower-bud
 ... on a barren and unattended patch of land many healthy flowers can
 blossom ...

I do, however, dispute Hsieh (2008)’s translation. I think that the noun phrase in question should not be translated as it is, but with “on a barren and unattended

³Thanks to Hsieh Miao-Ling for pointing this out to me.

patch of land many healthy flowers can blossom”. Her translation suggests that in Chinese there exists a phenomenon like the English-type mass noun pluralization. In English it is the case that if a mass noun is pluralized, a reading that refers to different kinds is obtained. If a word like *water* is pluralized, the resulting form *waters* is in the unmarked case interpreted as “different kinds of water”. This phenomenon does not exist in Chinese, hence the translation should be adjusted.

This little excursion should not disguise the fact that my analysis as formulated so far cannot explain the data presented. Even more examples like this can be found, as can be seen below.

- (4.44) 天上 飘着 朵朵 云。
Tiān-shàng piāo-zhe duǒ-duǒ yún.
 sky-on float-PROGASP CLF-CLF cloud
 Many clouds are floating in the sky.

- (4.45) 脸上 流下 滴滴 眼泪。
Liǎn-shàng liú-xià dī-dī yǎn-lèi.
 face-on flow-down drop.CLF-drop.CLF eye-tear
 Many tears are running down on the face.

Also here, the collective plural interpretation (many X) can be found without the presence of — *yī* ‘one’. Interestingly, as opposed to other examples of reduplication, the problematic sentences are equally grammatical with or without — *yī* ‘one’ (as in 4.46), whereas in the unmarked cases, the reduplication must occur with — *yī* ‘one’ (as in 4.47)

- (4.46) 天上 飘着 一 朵朵 云。
Tiān-shàng piāo-zhe yī duǒ-duǒ yún.
 sky-on float-IMPASP ONE CLF-CLF cloud
 Many clouds are floating in the sky.

- (4.47) 我 看到了 *(一) 只只 小鸭。
Wǒ kàndào-le yī zhī-zhī xiǎo-yā.
 I see-PERFASP ONE CLF-CLF little-duck
 I have seen a lot of little ducks.

This supports my initial classification, because it shows that there is a fundamental difference between those two cases. The assumption must be that the phrase is initially generated with a preceding *yī* ‘one’ that is for some reason not realized, but interpreted. What seems to unify the examples is that they all include unaccusative

verbs like 开出 *kāi-chū* (grow.out) ‘to blossom’, 飘 *piāo* ‘to float’, and 流下 *liú-xià* (flow.down) ‘to flow down’. The assumption may still need some additional refinements, as there still remain conflicting data.

- (4.48) 分析上 遇见 种种 困难
fēnxi-shàng yù-jìàn zhǒng-zhǒng kùnnán
 analysis-on meet-see kind.CLF-kind.CLF difficulty
 to come across all sorts of difficulties in the analysis (Paris 2007:6)

(4.48) does not give us a lot of evidence in determining what we are dealing with, because no overt subject is realized in the sentence. The suffix 见 *jiàn* ‘see’, that appears after the verb normally only marks transitive verbs. Also the fact that there is no overt subject realized should not be surprising for the analysis of a pro-drop-language. However, following Paris (2007)’s translation, (4.48) does not imply an agentive subject.

4.2.2.2 Semantic Behavior

I will continue now by taking a closer look at the meaning of the *yī*-CLF-CLF-N-type of reduplication. In the last section I started by terming the reading that is associated with it “collective plural reading”, which means that it denotes many instances of the noun phrase. In this section, I would like to make this observation a little more precise. Let’s look again at example (4.36), here repeated as (4.49).

- (4.49) 一 只只 小鸭 在 我 面前 过 河。
Yī zhī-zhī xiǎo-yā zài wǒ miàn-qian guò hé.
 one CLF.CLF little-duck PREP I face-before cross river
 A lot of little ducks cross the river in front of my eyes.

In the following I will to explain what should be understood as “a lot of little ducks” or “many instances of the noun phrase”. The truth value of the sentence above is false if the noun phrase refers to, say, two ducks. This means that the process in the sentence above is not a Indo-European-type plural, as Paris (2007) claims, because in languages like English, the plural is marked also on the phrase *two ducks*. In Chinese, however, what the modified noun phrase refers to is a number greater than that, unlike the Indo-European plural, which does not have such an implication.

Informant questioning revealed that the *yī*-CLF-CLF-N-type of reduplication is used when the number that is to be represented is unexpectedly big or uncountable at first sight for the speaker, implying a vagueness of quantity. This is relatable to cross-linguistic tendencies.

The data is similar to a phenomenon observed by Acquaviva (2008:109), termed “Greater Plural”. He gives the following example:

(4.50) The river discharges its **waters** into the lake.

The noun in question is *waters*, which is in this sentence interpreted as ‘a big quantity of water’, and not as ‘some kinds of water’ or ‘several servings of water’, as usually expected for mass noun plurals. The typical interpretation of this kind of plural is that the phrase in question is understood as the maximum sum of instances of N. Additionally, this implies the idea of abundance. Even more, Acquaviva (2008) describes that the idea of scatteredness is typical for this kind of operation. To him, the outcome denotes a mass with a concrete extension.

All these are features also described by my informants. The idea of abundance was already discussed above, and also the impression of scatteredness, associated with the reduplication is described. Alexiadou (2009) describes another interesting feature for this kind of pluralization for Greek. To her, typically there are two kinds of pluralization in a language, one productive kind, and one unproductive, morphologized kind, that can exhibit mass plural properties. This prediction for mass noun plurals is also borne out in the Chinese data, which is not accepted by all speakers. Mass noun plurals are also found in Greek, see Alexiadou (2009) and Tsoulas (2006), with similar interpretations.

The above is evidence against Paris (2007)’s assumption, that the Chinese-type classifier reduplication fulfills the purpose of the Indo-European-type plural. The two pluralizations are very different from each other. Indo-European-type plural is a highly productive morphological process, and can be added to almost any noun, including and exceeding “two”. In semantics, this kind of pluralization presupposes atomized nouns.

Chinese classifier reduplication yields only a subjectively high quantity of which the exact amount is normally left unspecified. It is not at all the case that every noun is specified for number by having a reduplicated or not-reduplicated classifier, which is what Paris (2007) would suggest. It is not even the case that every noun can in theory be specified for number in this way. The classifier reduplication appears only in limited positions, such as the subject position of a sentence. A real correlate to Indo-European-type number in Chinese may be the plural suffix 们 *men*, as will be explained below. There is, however, ways of expressing plural even in a language that does not have a grammatically expressed category for doing so.

Let me again refer to Chierchia (1998), who assumes that all Chinese nouns are mass nouns, which means in his conceptualization that they are lexically pluralized.

Consequently, he expects that pluralization in languages like Chinese does not exist. The claim that classifier reduplications are a form of (non-Indo-European-type) plural evidently stands in conflict with his claim.

This conflict calls for some theoretical adjustments. As already mentioned above, we deal with a phenomenon that is typical to the pluralization of mass nouns. In Chierchia (1998)'s conception, the problem is that mass nouns are already pluralized and thus do not only contain atoms, as would be expected from languages whose nouns are standardly of type $\langle e, t \rangle$. The most plausible solution to this is that the Chinese classifier-reduplication plural cannot assume atomicity as a condition, which is also suggested as one possible solution by Tsoulas (2006). Such a solution would still require a different mass noun conception, not necessarily as two different domains, but a lexical pluralization, as Chierchia (1998) suggests, would not do either.

Note that there still exists another kind of pluralization in Mandarin, which is formed by suffixing 们 *men* to a noun. This operation can only apply to humans. The restriction may suggest that it is closer to Indo-European-type pluralization, because possibly humans are actually represented as individual entities, and not pluralities or however else the difference between mass and count nouns may be conceptualized. The assumption that the domain of this pluralization is restricted to individuals may be strengthened by the fact that this kind of plural suffix may also appear with proper names, as pointed out by Iljic (1994:111):

- (4.51) 小羌们 什么 时候 来?
Xiǎo-Qiāng-men shénme shíhòu lái?
 Little-Qiang-MEN what time come
 When are Little Qiang and the others coming?’

The sentence can also have the interpretation of ‘people that have the same properties as Little Qiang’. The main discussion in the literature was whether this is actually a plural suffix or a collective marker. However, this distinction does not lessen the contradiction in which this data stands to Chierchia (1998)'s claims, but compels us to assume there is still more to be said about the count-mass distinction.

There is one easy and one difficult solution to the problem. One solution is to posit that Chinese makes use of type-shifting devices for this kind of pluralization. Another solution is to chose the traditional solution of distinct domains for count and mass nouns, in which the Chinese count nouns would take up only a relatively small portion. This is a solution adopted by Kurafuji (2004). The decision on this question is left to further research.

To sum up briefly I would like to suggest that Chierchia (1998)'s observation is valid for plurals that require atomicity, but not for other ways of expressing plurality. Also, there may be exceptions to his prediction that all nouns are mass.

The next issue I would like to discuss is the variation that the *yī*-CLF-CLF-N-type reduplication exhibits in interpretation. As already discussed above, the interpretation of these phrases implies a big number of instances of N, but also conveys an idea of scatteredness or dispersedness. This reading may be further modified by contextual restrictions.

I will start by comparing the following examples with each other:

(4.52) = (4.3), repeated

海滩上 他 把 一枚枚 贝壳 打开来 看看
Hǎitān-shàng tā bǎ yī-méi-méi bèiké dǎ-kāi-lái kàn-kàn
 beach-on he PREP one-CLF-CLF shell knock-open-come see-see
 里面 有 没 有 珍珠。
lǐ-miàn yǒu méi yǒu zhēnzhū.
 in-side have not have pearl

On the beach he/she knocked open a lot of shells to see whether there was a pearl inside.

(4.53) 服务员 上来 道道 菜。
Fúwù-yuán shàng-lái dào-dào cài.
 service-employee up-come CLF-CLF dish
 The waiter/waitress brought a lot of dishes.

(4.54) = (4.36) repeated

一 只只 小鸭 在 我 面前 过 河。
Yī zhī-zhī xiǎo-yā zài wǒ miàn-qián guò hé.
 ONE CLF-CLF little.duck PREP I face-before cross river
 A lot of little ducks crossed the river in front of my eyes.

(4.55) 从 10 点 开始, 一棵棵 树 都 被 砍倒, 12
Cóng 10 diǎn kāishǐ, yī-kē-kē shù dōu bèi kǎn-dǎo, 12
 from 10 o'clock start one-CLF.CLF tree ALL PASS chop-fall, 12
 点 一下子 停下来。
diǎn yīxiàzi tíng-xià-lái.
 o'clock suddenly stop-down-come
 Starting from 10 o'clock, a lot of trees were chopped down, at 12 o'clock it suddenly stopped.

(4.56) = (4.43) repeated, (Hsieh 2008:3) with adjusted translation

... 一 块 贫瘠 及 乏人 呵护 的 园地, 能
yī kuài pínjí jí fá rén hēhù de yuándì, néng
one CLF barren MFP and lack care MFP land can
 开出 朵朵 健康 的 花蕊 ...
kāi-chū duǒduǒ jiànkāng de huā-ruì ...
grow-out CLFCLF healthy MFP flower-bud
 ... on a barren and unattended patch of land many healthy flowers can
 blossom ...

Consider (4.52) first. What this sentence implies is that the person in question opens one shell after the other, until he has finally opened a lot of shells. The action is described as a sequence of identical sub-actions. It is not always the same shell that is opened. Example (4.53) is similar. It is understood that the waiter brings different dishes one after the other. Interestingly, the logically possible option of a waiter with a giant tray who brings a huge number of different dishes at once is not the preferred reading. Note that this sentence belongs to the exceptions discussed above, because the numeral — *yī* ‘one’ does not appear.

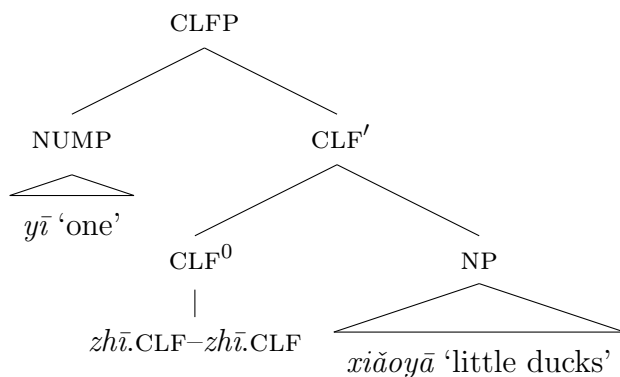
Sentence (4.54) is less specific. Native speakers report that they do not know whether this means one duck follows the other duck or many ducks cross the river at once. Also the second option implies sequentiality for some ducks, but not for all. (4.55) behaves likewise. If the context gives no clue *e.g.* as to how many workers were involved, nothing can be said about whether it was one tree after the other or many trees at once that were chopped. Also sentence (4.56) is unclear about when or how the flower buds bloom, the only thing that is clear is that different flower buds are meant.

The solution to this problem does not lie in the grammatical features of the phrases in question. As the above examples show, the interpretations clearly interact with what is contextually likely or not, and is influenced by the world knowledge of the speakers. Thus, the sequentiality interpretation is governed mainly by two factors: one of them is lexical semantics. If the reduplication cooccurs with a predicate that allows for simultaneous realization of more than one process, this is the way it may be interpreted. If the predicate implies the action in question occurs one after the other, then this reading will be preferred. The second factor is the number of the agent. If there exists more than one agent, it is more likely that the process need not emerge in a consecutive fashion. If there is only one, however, it is most likely that this agent does whatever he/she does one after the other.

4.2.2.3 Syntactic Behavior

A syntactic structure for the $yī$ -CLF-CLF-type of reduplication is proposed in (4.57).

(4.57) $yī$ -CLF-CLF-type reduplication



This structure is supposed to capture the following syntactic facts: The reduplication is a morphological process. This can be seen because no constituent can intervene between the reduplictees, thus examples like the following are ungrammatical:⁴

(4.58) * 一只又一只小鸭
 yī zhī yòu zhī xiǎo-yā
 one CLF again CLF little-duck

Because the reduplication can exclusively follow 一只 *yī* 'one', a standard classifier structure was chosen. These structures were discussed in section 2.3. Future research will have to determine the status of this ambiguous numeral more carefully.

This section showed the $yī$ -CLF-CLF-type of reduplication is a form of plural formation. From a semantic perspective, this required the discussion of the obvious contradiction to the prediction that mass nouns are not expected to pluralize. A syntactic structure was proposed, suggesting this kind of reduplication is a morphological process.

4.2.3 The NUM-CLF-NUM-CLF *de* n-Type

The third type of reduplication that we saw had the sequence NUM-CLF-NUM-CLF preceding the noun. Consider the following example:

(4.59) 狼吃了 一只 一只的 小鸭子
 Láng chī-le yī-zhī yī-zhī(de) xiǎoyāzi.*
 Wolf eat-PERFASP one-CLF one-CLF MFP

The wolf ate the little ducks one by one.

⁴又 *yòu* 'again' was chosen because it can intervene in the NUM-CLF-NUM-CLF-kind of reduplication

Compared to the other types of reduplication, this one differs in form as well as content. The numeral appears two times in this sentence, and the reading associated with this is ‘to do something in a NUM by NUM fashion’. The next section is going to explore the features of this type of reduplication with the goal of proposing a semantic and syntactic analysis.

This reduplication exhibits a much more free distribution. This refers to the degree of freedom in the choice of the numeral, which will point us to the semantic structure of distributive numerals. The freedom with respect to the choice of syntactic position, which is also related to the obligatory presence of the modifying particle 的 *de*, will be the main evidence for the syntactic structure proposed.

4.2.3.1 A First Assessment

One of the most ostensible features of this reduplication is that also numerals apart from 一 *yī* ‘one’ are usable in this construction, as the next example shows.

- (4.60) ? 博物馆里 每个 画家 才 有 两幅 画,
Bówùguǎn-lǐ měi-gè huàjiā cái yǒu liǎng-fú huà,
 Museum-in every-CLF painter only exist two-CLF painting
 两幅 两幅地 挂着。
liǎng-fú liǎng-fú-de guà-zhe.
 two-CLF two-CLF-MFP hang-PROGASP

There are only two paintings per artist in the museum, hanging two by two.

What the example (4.60) shows is an actual numeral interpretation, as opposed to the idiosyncratic interpretation of 一 *yī* ‘one’ that was witnessed in the *yī*-CLF-CLF-type of reduplication.

This type of reduplication is far less constrained in the positions in which it can appear. Thus, in addition to the object position in example (4.60), we can find it in subject as well as adverbial position. Example (4.61) shows the former, (4.62) the latter.

- (4.61) 一只 一只的 小鸭子 都 吃 面包。
Yī-zhī yī-zhī-de xiǎo-yāzi dōu chī miànbāo.
 one-CLF one-CLF-MFP little-duck all.ADV eat bread

One duck after the other eats bread (They queue to eat bread)

- (4.62) 狼 把 小鸭子 一只 一只地 吃掉。
Láng bǎ xiǎo-yāzi yī-zhī yī-zhī-de chī-diào.
 Wolf PREP little-duck one-CLF one-CLF-MFP eat-drop

The wolf eats the little ducks up one by one.

(4.62) is basically a transitive structure, but the object is preposed for information structure purposes. This is not related to the reduplication process itself. What this example also shows is that this reduplication can be subject to overt movement as a constituent. We can see that the noun head of the phrase, 小鸭子 *xiǎoyāzi* ‘little ducks’ appears not in the same phrase as the reduplication.

Note also the the particle 的/地 *de* exhibits two different orthographic variants. In (4.62), an adverbial position, it is written 地, whereas in adnominal uses, as in example (4.61), the character 的 is used. This difference is neglected in the relevant literature (Paul 2005; Rubin 2002; Sio 2006), and thus will also be in this treatment.

Notably, the particle has been present in all the cases of NUM-CLF-NUM-CLF-N reduplication that were shown so far. The particle is obligatory in this structure, as is shown in the following example:

- (4.63) * 一只 一只 小鸭子 都 吃 面包。
 Yī-zhī yī-zhī xiǎoyāzi dōu chī miànbāo.
 one-CLF one-CLF little duck all.ADV eat bread

The particle 的 *de* appears in multiple contexts in the Chinese language. It can be used as an adjective, possessive, and relative clause marker, in addition to its usage in phrases with classifiers. The exact properties of it were already discussed in chapter 3. There is one property of 的 *de* that is crucial to the argument in this section: Rubin (2002) and Sio (2006) found that 的 *de* is the head of its own projection, which is also what I will assume for the reduplication usage.

4.2.3.2 Semantic Behavior

As mentioned above, the reduplication bears the interpretation of ‘doing a thing in a NUM by NUM manner’. As described in Gil (2008), this interpretation is a crosslinguistically frequent phenomenon for reduplicated numerals: this pattern is analyzed as a distributive numeral marking. The following sentence helps explain what is meant by distributivity:

- (4.64) Bill and Mary carried three suitcases.

According to Gil (2008), this sentence has two possible interpretations, one in which, say, Bill carried one suitcase and Mary carried two or the other way round. The second reading is that they carried three suitcases per person, meaning six suitcases in total. A third reading, not mentioned by Gil (2008), namely one in which the two persons carry all the three suitcases together may be added as a subclass of the first reading. Typological evidence shows that many other languages have a

grammaticalized device in order to select the second reading. This can involve different strategies, but in the corpus of the 250 languages in the *World Atlas of Language Structures* there are 84 languages that mark their distributive numerals with reduplication. Gil (2008:2) gives the following example from Georgian:

- (4.65) *Romanma da Zurabma sam-sami čanta*
 Roman.ERG and Zurab.ERG DISTR-three.ABS suitcase.ABS
caixo.
 carry.PSG.3SG
 (i) Roman and Zurab carried three suitcases each/apiece.
 (ii) Roman and Zurab carried the suitcases three by three.

The example with its reading (ii) strikingly resembles the Chinese examples that we have seen so far. Note that the example also includes a reduplicated numeral *sam-sami* ‘DISTR-three’, although in the Georgian case, they are not phonetically identical. The Chinese translations of the two readings are given in the following:

- (4.66) Roman 和 Zurab 都 提了 三个 箱子。
Roman hé Zurab dōu tí-le sān-gè xiāngzi.
 Roman and Zurab ALL carry-PERFASP three-CLF suitcase
 Roman and Zurab carried three suitcases each.
- (4.67) Roman 和 Zurab 三个 三个地 把 箱子
Roman hé Zurab sān-gè sān-gè-de bǎ xiāngzi
 Roman and Zurab three-CLF three-CLF-MFP PREP suitcase
 提过来。
tí-guò-lái.
 carry-over-come.
 Roman and Zurab carried the suitcases over three by three.

The reason for these differences seems to lie in the multiple possibilities to express distributivity in Chinese. Either the predicate is distributed over, as in example (4.66), which implies that six suitcases are carried in total. Only example (4.67) distributes over the numerals in the strict sense. This example implies that there is a mass of suitcases, which are carried in a three by three manner. The sentence needs to be formed with the preposition 把 *bǎ* to capture the definiteness relation in the Georgian model. Again, we see that the presence of the particle 的 *de* triggers a mass interpretation in the noun, as was already explained in section 3.

4.2.3.3 Syntactic Behavior

Knowing more about the semantic nature of the NUM-CLF-NUM-CLF-type of reduplication, we can now proceed to the syntactic discussion. Interestingly, from what

I showed so far, it is a little misleading to deal with this kind of reduplication under the label of “classifier reduplication”, what it actually should be thought of is a case of reduplication of the numeral. Still, also the first term is justified in a way, because we are actually faced with two instances of the classifier in the phonological form.

Granted that the reduplication indeed targets the numeral, it is not obvious why a sequence NUM–NUM–CLF would not be possible. This brings us back to the discussion of the make-up of a classifier phrase that was brought up in section 2.3. It was mentioned that there exist different opinions about whether the classifier is a clitic to the numeral quantifier or projects a phrase on its own. The evidence from reduplication suggests that the classifier is enclitic to the numeral, because it reduplicates with it.

There are still some other ways in which this kind of reduplication is different from the other types. As opposed to the reduplications in section 4.2.1 and 4.2.2, of which the possibilities for movement were very limited and other constituents could not intervene between the classifiers involved in the reduplication and the “numeral” — *yī* ‘one’, this is not at all the case here: The number phrase can be realized separately from the noun. Also, the adverb 又 *yòu* ‘again’ can appear between the reduplicated numerals, as is shown below:

- (4.68) 一只 又 一只的 小鸭
 yī-zhī *yòu* *yī-zhī-de* *xiǎo-yā*
 one-CLF again one-CLF-MFP little-duck
 one and yet another little duck

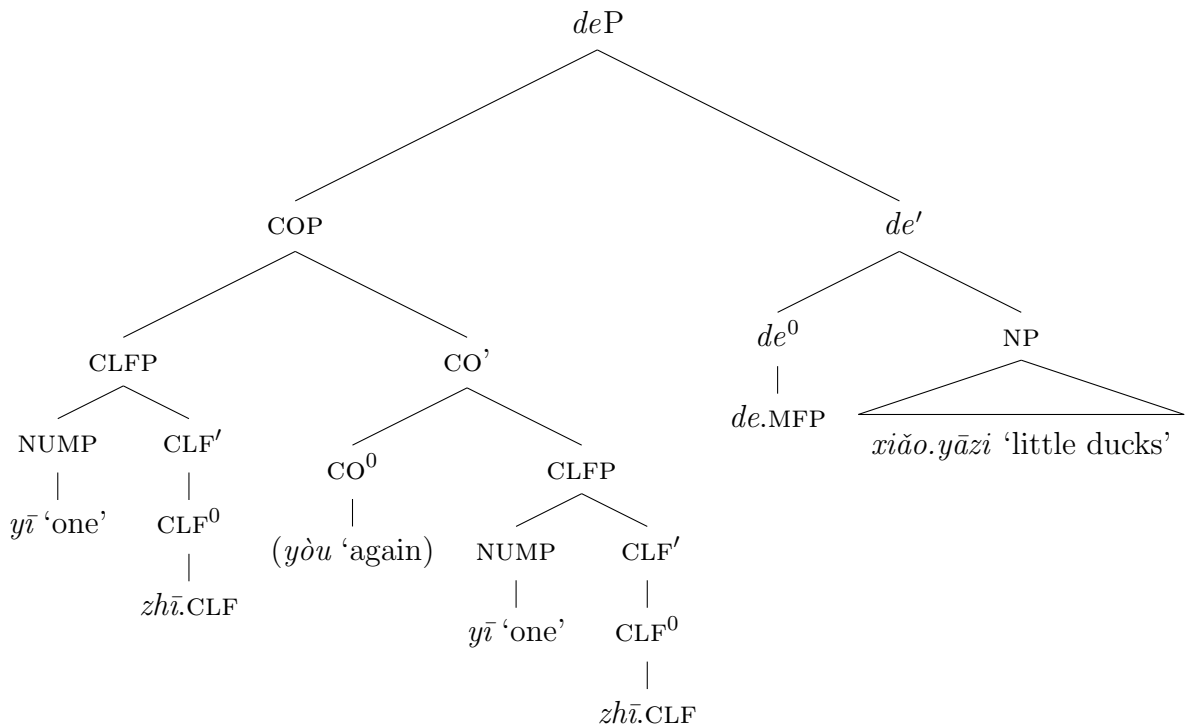
It is predicted because of the behavior of the obligatory particle 的 *de* that the reduplication and the noun it is applied to are realized in separate phrases, thus, the higher degree of mobility is expected. In the discussion of the other reduplication types, I already mentioned that I assume these processes to be morphological. The possibility for an intervening item 又 *yòu* ‘again’ shows that the NUM–CLF–NUM–CLF–type of reduplication is a syntactic formation.

It has been stated for independent reasons that the particle 的 *de* heads its own category. Rubin (2002); Sio (2006) claim this with respect to adjective phrases, I will assume the same for the usage involving classifiers. This further means that the whole reduplication is embedded in this phrase. The 的 *de*P itself immediately c-commands the NP below it. Note that this stands in contradiction with Cheng & Sybesma (1999), who claim that every Chinese NP is always preceded by a classifier, be it overtly or covertly. Future work will need to determine the question of whether there is any functional structure realized above these phrases.

As for the relation of the classifiers with respect to each other, they must be within one phrase, because they can be target of a movement operation together. Also because there is no differences in accent or phonological reduction there, I assume a coordination structure of the form proposed in Johannessen (1996) and Aoun *et al.* (1994).

A structure is proposed in the following:

(4.69) Structure Numeral Reduplication



This structure captures some crucial facts: Because the whole reduplication is embedded in a *deP*, and thus not directly selects for the noun, a greater degree of positions is assumed for it. Thus, the fact that it can appear with NPs as well as VPs is not surprising.

The particle 又 *yòu* ‘again’ serves us as evidence for assuming the in the above example empty category *CoP*. This category can optionally be filled by the particle, yielding a strikingly similar interpretation.

In the above section, it was argued that the NUM–CLF–NUM–CLF–type of reduplication is a case of distributive numeral formation. Semantic and syntactic arguments were taken into account for this conclusion.

4.3 Summary

In this chapter, I introduced the classifier reduplication data. I analyzed three distinct patterns:

The CLF–CLF pattern is an expression of distributivity, thus, it has to cooccur with the distributivity marker 都 *dōu* ‘all.ADV’. Structurally, it has the function of a quantificational DP.

The *yī*–CLF–CLF-type is a mass plural formation. This raises many issues concerning the theoretical semantic conception of mass nouns, some of which were covered in the relevant discussion.

The NUM–CLF–NUM–CLF-form of reduplication is a case of distributive numeral formation. Structurally, this reduplication resides within a phrase projected by the modifying particle 的 *de*, and is formed by a coordination operation.

The data presented in this chapter does not point to the fact that these reduplications are all different outcomes of the same process. It was shown that the evidence suggests the CLF–CLF-type and the *yī*–CLF–CLF-type result from a morphological process, whereas the NUM–CLF–NUM–CLF-type is syntactic in origin. Semantically the processes also appear very different.

However, there is a little common ground in the semantics, which is distributivity. It was already made explicit in the above discussions that the CLF–CLF and the NUM–CLF–NUM–CLF-pattern express distributive universal quantification and distributive numbers. Also the collective plural interpretation was described to imply some dispersedness and scatteredness, which are typically seen as a hallmark of distributive interpretations. Thus, even though the processes are not generatively related, these data still suggest that the numeral and classifier phrases are the locus in which distributivity is encoded in Chinese.

Chapter 5

Conclusion

In order to form a basis for the syntactic and semantic analysis of the classifier reduplication in Mandarin Chinese, this thesis explored some important properties of classifiers.

From a typological perspective, Chierchia (1998) argued that classifier languages are not expected to reflect the mass–count distinction in the noun, but rather represent all nouns as mass nouns, which are argumental in their character. Consequently, because mass nouns do not pluralize, these languages are not expected to have a morphological plural. This prediction does not hold for the data examined in this work.

Following Cheng & Sybesma (1998), this thesis assumes that in syntax, classifiers and measures must be represented differently. However, arguments against the view that the mass–count distinction is manifested in the difference between classifiers and measures were presented, one of them being that there exists the systematic possibility for classifiers to be used in measure–contexts. Rather, it was assumed that most classifying items can be ambiguous between a measure and classifier function.

It was pointed out that Cheng & Sybesma (1999)’s idea that bare nouns in Mandarin are governed by a covert classifier phrase does not make clear predictions for the cases in which 的 *de* appears after a classifier. Because of the serious interpretation difference that this modifying particle induces, it was argued that these instances cannot be treated in the same manner as the bare noun cases.

Thus, the syntactic structure of this analysis assumes that mass interpretations appear in a position adjoined to the noun, whereas classifying interpretations c-command it. In order to account for the definiteness phenomena that occur with classifier phrases, it was proposed that the numeral — *yī* ‘one’ can move to DP in order to obtain an indefinite reading.

On basis of these general observations and assumptions, I analyzed that the cases of classifier reduplication fall in three classes.

- (i) CLF–CLF–N. This pattern was argued to be a distributive quantifier. Evidence for this was its cooccurrence with the distributive adverb 都 *dōu* ‘all’. Syntactically, it behaves parallel to other quantificational determiners. Also the limitation of the reduplication to occur only in pre-verbal position can be explained if movement to a scopal position DISTP is assumed along the lines of Beghelli & Stowell (1997).
- (ii) $Y\bar{t}$ –CLF–CLF–N. The sequence was shown to bear a plural interpretation, which stands in contrast to the predictions made by Chierchia (1998), who assumes that the nouns in classifier languages are actually mass nouns, which do not pluralize. Conversely, the structure above calls for a new approach to the generalizations about classifier languages. Syntactically, the structure was argued to behave like a complex classifier.
- (iii) NUM–CLF–NUM–CLF–N. This reduplication is an instance of distributive numerals, which is attested frequently when numerals are reduplicated. Syntactically, this is achieved with a coordination phrase, which is itself embedded in a modifier phrase headed by 的 *de*. This is the reason why this phrase can appear in contexts modifying nouns as well as verbs.

Despite the fact that all of the structures above involve multiply represented classifiers, my research showed that they do not actually perform classifier functions. Additionally, it is interesting to see that the common denominator in the reduplication structures seems to be distributive meanings, although they result in very different structures and interpretation.

As always, further work ought to be done. In this case, this would concern the issues of quantification. Remaining open questions concern the scopal behavior of the reduplication, but also of classifier phrases themselves. Additionally, it remains unsolved how classifiers interact with determiners. I hope to be able to address some of these topics in future research.

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Appendix

Glossary

个 <i>gè</i>	Default classifier
位 <i>wèi</i>	Honorary classifier for humans
匹 <i>pī</i>	Horses
卷 <i>juǎn</i>	Rolled items like films in photocameras; rolled kinds of books
只 <i>zhī</i>	Small animals like birds, bugs, cats; small items like watches, dumplings, shoes
块 <i>kuài</i>	Pieces of a whole; monetary units; small items like stones
头 <i>tóu</i>	Agricultural animals, cows, pigs
峰 <i>fēng</i>	Camels
幅 <i>fú</i>	Hanging items like pictures, calligraphies, also glasses
张 <i>zhāng</i>	Flat items like pieces of paper, beds, tables
本 <i>běn</i>	Books
朵 <i>duǒ</i>	Flowers, clouds
条 <i>tiáo</i>	Long Objects like branches, twigs; long animals like snakes, fish; textiles like towels, trousers; abstract objects like news, ideas
枚 <i>méi</i>	Small flat things like coins, medals, stamps, shells
根 <i>gēn</i>	Long items, hairs, sticks, tails
棵 <i>kē</i>	Trees, cabbages, plants
次 <i>cì</i>	Verbal Classifier, signifying times done an activity

辆 <i>liàng</i>	All kinds of vehicles; cars, bicycles, motorcycles
道 <i>dào</i>	courses of food, doors, (exam) questions
面 <i>miàn</i>	Flat objects like mirrors

Zusammenfassung auf Deutsch

Die vorliegende Arbeit beschäftigt sich mit dem Phänomenkomplex der Reduplikation von Klassifikatoren im Mandarin-Chinesischen. Sie geht anhand von semantischen und syntaktischen Kriterien davon aus, dass die folgenden drei Gruppen von Reduplikation existieren:

- (i) Klassifikator–Klassifikator–Reduplikation: Dieser Reduplikationstyp trägt die distributive Interpretation “jedes einzelne N”. Es ergeben sich daraus Interaktionen mit dem Adverb 都 *dōu* ‘alle’, das als Markierer von distributiven Interpretationen analysiert wurde. Syntaktisch wird die Reduplikation als Determinator gesehen.
- (ii) *yī*–Klassifikator–Klassifikator–Reduplikation: Diese Sequenz ist ein Beispiel für die Formation von Massenpluralen. Diese Analyse steht im Kontrast mit der in der Fachliteratur gemachten Behauptung, dass die Differenzierung zwischen Massen- und zählbare Nomen im Chinesischen nicht kodiert sei, sondern alle von ihnen Massennomen sein. Pluralisierung wird bei diesen ausgeschlossen. Syntaktisch handelt es sich um einen morphologisch komplexen Klassifizierer.
- (iii) Numerale–Klassifikator–Numerale–Klassifikator–Reduplikation: Dieser Typ stellt eine distributive Numerale dar, die typologisch häufig durch eine Reduplikation gebildet wird. Die Interpretation, aber auch die für diese Form obligatorische Modifikationspartikel 的 *de* sind der Grund, dass die Reduplikation auch in adverbialer Form auftreten kann. Sie hat die syntaktische Form einer Koordination.

Als Grundlage für diese Analyse wird auch Fachliteratur über Klassifikation besprochen. Typologische Arbeiten besprechen die möglichen syntaktischen Folgen sowie diachrone Entwicklung, weiters die typischen semantischen Kategorien, die durch Klassifikation abgedeckt werden (Greenberg 1975; Croft 1994). Im Widerspruch zur Hypothese, ein Reduplikationstyp sei ein Fall von Massenplural ist der Artikel von Chierchia (1998), der voraussagt, dass Nomen in Klassifikatorsprachen

nur Massennomen seien, deren besondere Eigenschaft es ist, dass sie schon lexikalisch pluralisiert sind. Davon ableitbar sind die zutreffenden Voraussagen, dass Klassifikatorensprachen keinen morphologischen Plural und keine Artikel haben.

Eine wichtige Stellung nehmen auch die Arbeiten über die Syntax des Chinesischen ein. In dieser Domäne wird diskutiert, ob es einen syntaktischen Unterschied zwischen Klassifikatoren und Maßwörtern geben soll (Cheng & Sybesma 1998), sowie die unterschiedlichen Interpretationen von unmodifizierten Nomen (*bare nouns*) und deren strukturelle Repräsentation (Cheng & Sybesma 1999).

Ein Seitenthema ist die Beschaffenheit der Modifikationspartikel 的 *de*, spezifisch in Klassifikatorphrasen. Der Analyse von Rubin (2002) folgend, wird analysiert, dass es sich um eine funktionale Kategorie handelt, die sich in der Adjunktposition ihres Modifikatums befindet. Davon wird abgeleitet, dass nur Masseninterpretationen von Nomen mit dieser Partikel auftreten können.

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