Chapter Two

Linguistic Properties and Literature Review of Chinese Classifiers

In this chapter, linguistic properties of count and mass classifiers will be introduced in section 2.1. A classification of count and mass classifiers in terms of various semantic features will also be presented. Previous theoretical studies on Chinese classifiers will be reviewed in section 2.2. Empirical studies on language acquisition of Chinese classifiers will be discussed in section 2.3. Finally, a brief summary of this chapter will be given in section 2.4.

2.1 Linguistic Properties of Chinese Classifiers

In Chinese, simple numerals cannot quantify a noun by itself (Chao 1968, Li and Thompson 1981, Tai and Wang 1990, Myers 2000, Tien, Tzeng and Hung 2002). Instead, the language relies on what are known as measure words or classifiers. They are used along with numerals to define the quantity of a given object or objects and indicate the unit of measurement of some object just as their English counterparts in phrases like "five *bottles* of milk" or "a *piece* of paper."

Counting and measuring are two different ways to get the quantity information of entities. Measuring, or quantification, applies to mass-like entities. Counting, however, requires individuation of the noun referents and therefore applies to countable units. According to Cheng and Sybesma (1998), Chinese classifiers are of two categories, count classifiers and mass classifiers. The former is typically used with individual entities whereas the latter is used with mass-like entities. In other words, in a classifier language like Chinese, counting/measuring thus involves the obligatory occurrence of count and mass classifiers respectively. In this section we attempt to give a classification of Chinese count and mass classifiers and their respective subcategories. Each of the categories will be defined and explored with

collocating nouns specified.

2.1.1 Types of Count Classifiers

The presence of count classifiers marks not only the result of individuation but also classification (Chao 1968, Allan 1977). They are forms which denote a particular quality in the noun classified and carry information about the inherent traits of the noun referents being counted. In other words, a speaker is often constrained in the choice of a count classifier to be used with a given referent. If the referent is an animal, for example, s/he may be forced to use the animal classifier; if the referent is a vehicle, s/he may be constrained to use the vehicle classifier, thereby denoting a natural unit of animal or a natural unit of vehicle.

Given these, the classes encoded by the count classifiers tend to be semantically based (Tai and Wang 1990, Tai 1992, Tai 1994, Myers 2000). In what follows we will probe into count classifiers based on the major animate/inanimate distinction and their respective subtypes with collocating nouns specified.

Type 1: ANIMACY

Count classifiers comprise two categories: animacy and inanimacy. That animacy should be treated as a class apart is not surprising since the animate/inanimate distinction is always relevant in describing numeral classifier systems (Adams and Conklin 1973, Alan 1977, Tai 1992, Tai 1994, Li 1998, Wang 2001), and since animacy is often involved in distinctions drawn in the operation of other segments of the grammars of various languages, e.g., the structure of pronoun system, plural marking (Comrie 1989). Moreover, within the Chinese classifier system, the animate/inanimate split is also reflected by the fact that animate referents are always referred to with one of the limited number of animate classifiers, never

with other members of the system (to be discussed below) which are available to re-classify inanimate referents in the classifier system[1].

Within the animate subsection of the Chinese classifier system, the distinction between human and non-human is well maintained.

Type 1-1: human

Human classifiers can be further divided into two subtypes: general human classifier and honored human classifier (Myers 2000). The latter exhibits a higher social status of the human referents while the former denotes common humans who are not in the categories 'people to be polite to.' Therefore, an expression such as *yi ge ren* 'one CLcount (general) person' as in (1a) refers to any man or woman in the street, and *yi ge xiaotou* 'one CLcount (general) thief' refers to someone who steals things and thus is viewed as immoral and does not deserve any respect. In contrast, the expression *yi wei laoshi* 'one CLcount (honored) teacher' as in (2a) portrays the fact that in the Chinese society teachers are highly respected and traditionally enjoy high social status.

Type 1-1-1: general human

(1) a. *yi* *ge* *ren*

one CL person

'a (general) person'

b. *yi* *ge* *nanhai*

one CL boy

'a (general) boy'

[1] The default classifier *ge* is an exception. It is the most frequently used classifier when a more specific classifier one does not apply. Hence, *ge* can be used for classes as disjointed as humans, three dimensional objects, and abstractions. Even so, *ge* has a core meaning of 'human' (Myers 2000).

Type 1-1-2: honored human

(2) a. *yi* *wei* *laoshi*

one CL teacher

'a (honored) teacher'

b. *yi* *wei* *keren*

one CL customer/guest

'a (honored) customer/guest'

Type 1-2: animal

Animal classifiers consist of two types of classifiers. One is the classifier *zhi* and the other is the classifier *tou*. Both classifiers *zhi* and *tou* are used to specify animals being enumerated. *Zhi* is used with any animals, functioning as a general animal classifier such as *yi zhi mayi* 'an ant' as in (3b). *Tou*, on the other hand, is based on the part-whole relationship between the animal enumerated and its head. That is, one prominent attribute (e.g., head) of the animal referent is used to refer to the whole referent (e.g, cow, and elephant). For instance, the expression *yi tou niu* 'a cow' as in (4a) emphasizes the salient perceived property of the cow's head and therefore the classifier *tou* is used to refer to the whole cow.

Type 1-2-1: animal

(3) a. *yi* *zhi* *gou*

one CL dog

'a dog'

b. *yi* *zhi* *mayi*

one CL ant

'an ant'

Type 1-2-2: animal

(4) a. *yi* *tou* *niu*

one CL cow

'a cow'

b. *yi* *tou* *daxiang*

one CL elephant

'an elephant'

Type 2: INANIMACY

Chinese count classifiers used to enumerate inanimate concrete objects[2] exhibit the feature of classifying nouns on the basis of two rather distinct subgroups. One comprises the **shape/dimensionality** classifiers, in which three basic shapes of long, flat and round are encoded. These shape classifiers are used for categories containing extremely disparate referent types unified by one particular physical property, e.g., long and slenderness (Tai and Wang 1990, Tai 1992, Tai 1994). The other subgroup comprises the **function/type** classifiers, which characterize classes such as bounded volumes, tools, plants, and buildings (Wiebusch 1995). Such function/type classifiers usually refer to objects of a similar function or to entities of the same type. *Dong*, one of the classifiers for buildings, for instance, is used with a group of referents share the same physical composition, characteristic function, method of construction, etc. In other words, the building classifier *dong* can be used with entities such as *gongyu* 'apartment,' *dalou* 'high-rise,' and *haozhai* 'mansion.' It denotes categories whose members share a number of properties.

In what follows, we will only talk about count classifiers belonging to the

[2] Here, we will only focus on the physically semantic properties of Chinese classifiers rather than their natural extension and metaphorical extension.

shape/ dimensionality category, for there is still no general consensus on the cognitive categorization of function/type classifiers.

The **shape/dimensionality** classifiers are dominated by shape-denoting forms such as *tiao*, *zhang*, and *ke*. Such shape classifiers fall into three subtypes: one dimension, two-dimension, and three-dimension (Allan 1977, Tai and Wang 1990, Tai 1992). As discussed earlier, members of the same shape classifier (e.g., *shengzi* 'rope,' *chuan* 'boat,' and *xianglian* 'necklace,' *congyoubing* 'deep-fried scallion pancake,' *baozhi* 'newspaper,' and *kapian* 'card') may have nothing in common other than the fact that *shengzi, chuan,* and *xianglian* are all long and slender, and thus can co-occur with the classifier *tiao,* or that *congyoubing*, *baozhi*, and *kapian* are flat and thin, and thus can co-occur with the classifier *zhang*.

Type 2-1: saliently 1-dimentional (long)

There are three classifiers for saliently one-dimensional objects in Mandarin, namely, *tiao*, *gen*, and *zhi*. *Tiao* indicates long and more flexible entities whereas *gen*[3], and *zhi* indicate long and more rigid entities (Tai and Wang 1990, Loke 1991). Take *xiangpijin* 'rubber band' and *zhuzi* 'pillar' for example. A rubber band is a long and bendable object and therefore it can be classified by *tiao*. On the other hand, a pillar is a tall upright post used as a support for a roof or bridge. It is strong and will not bend or change its shape and thus can be classified by *gen.* In addition to being used with long and rigid objects, *zhi* also denotes cylindricity of the saliently 1-D rigid objects.

[3] According to Tai and Wang (1990), *gen* and *zhi* are used with long and rigid objects (e.g., *yi gen gunzi* 'a rod' ; *yi zhi qiang* 'a gun'), while Lien and Wang (1999) argue that both *tiao* and *gen* have the feature 'extensible' that *zhi* does not share. For example, *yi tiao xiaohuanggua* 'a cucumber' and *yi gen toufa* 'hair' are potentially extensible and *yi zhi gunzi* 'a rod' is not extensible. Here, we will follow Tai and Wang's proposal that *gen* is used with long and rigid objects.

For instance, cylindrical objects such as *bi* 'pen,' *qianbi* 'pencil,' *lazhu* 'candle,' and *xiangyan* 'cigarette' all take *zhi* as their classifiers. See below for more examples.

(5) a. *yi* *tiao* *xiangpijin*
one CL rubber band
'a rubber band'

b. *yi* *gen* *diaoyugan*
one CL fishing rod
'a fishing rod'

c. *yi* *zhi* *qianbi*
one CL pencil
'a pencil'

Type 2-2: saliently 2-dimentional (flat)

There are three classifiers which can be used for saliently two-dimensional objects in Mandarin, namely, *zhang*, *pian*, and *mian*. *Zhang* denotes flat and thin entities such as *zhi* in (6a). *Pian* indicates flat, thin, and small objects such as *yezi* in (6c). *Mian* refers to objects with flat surfaces such as *qiang* in (6b) (Tai and Wang 1990, Loke 1991, Loke 1996).

(6) a. *yi* *zhang* *zhi*
one CL paper
' a piece of paper '

b. *yi* *mian* *qiang*
one CL wall
' a wall '

c. *yi* *pian* *yezi*

one CL leaf

' a leaf '

Type 2-3: saliently 3-dimentional (round)

There are three classifiers for saliently three-dimensional roundish objects of different sizes in Mandarin, namely, *ge*, *ke* and *li*. *Li* is for roundish objects which are so small that they are hard to count when they are together, e.g., *yi li mi* 'a grain of rice,' *yi li sha* 'a grain of sand'. *Ke* denotes round entities which are big enough for the eyes to perceive, but small enough to pick up without effort, e.g., *yi ke zuanshi* 'a diamnond,' *yi ke yachi* 'a tooth,' *yi ke juzi* 'a tangerine' (Kuo 1998). *Ge* is used for round objects so big[4] that they cannot be picked up easily with one hand, e.g., *yi ge xigua* 'a watermelon,' *yi ge tai yang* 'a sun,' *yi ge qiqiu* 'a balloon'. Notice that though bearing the identity of general classifier, *ge* is limited to entities without salient one-dimensionality or two-dimensionality. For example, if we substitute *ge* for *tiao* in the phrase *yi tiao gua*, the plant will no longer be *sigua* 'a sponge cucumber' or *xiaohuanggua* 'a cucumber', which features the saliently one-dimensional shape—longness. Instead, the plant will be considered roundish such as *xigua* 'a watermelon' or *hamigua* 'a cantaloupe' featuring the salient three-dimensionality.

(7) a. *yi* *ge* *qiqiu*

one CL balloon

'a balloon'

[4] There is an overlap among the three saliently 3-D classifiers due to the fact that 'size' is gradable (Saeed 2003). Such boundaries vary from person to person.

b. *yi* *ke* *juzi*

one CL tangerine

'a tangerine'

c. *yi* *li* *sha*

one CL sand

'a grain of sand'

2.1.2 Types of Mass Classifiers

Mass classifiers indicate "a quantitative measurement of the denotatum of the noun classified" and they typically do not denote any "inherent characteristic" or "salient perceived characteristics" of the noun referents with which they are associated (Allan 1977). That is, in measuring, units such as 'kilo' and 'cup' are used, regardless of the physical properties of the measured entities. For instance, both water and bananas can be measured in kilos, and both water and sugar can be measured by cups. Unlike count classifiers, the measuring units (mass classifiers), like 'kilo' and 'cup', carry little information about the inherent properties of the commodities, viz. water, bananas and sugar, being quantified. To put it another way, mass classifiers simply denote a measure of these things. Such classifiers are imposed units involving partitions, groupings, etc., as opposed to the natural units expressed by count classifiers.

Mass classifiers can be divided into four categories: standard measures, container measures, partitive measures, and group measures (Myers 2000).

Type 1: Standard Measures

They are conventionalized units used to indicate only the quantity of the nouns such as standard for length, weight, area, or volume, and have little to do with the

conceptual properties of the following objects such as *jin* as in (8a), *bang* as in (8b), *chi* as in (8c), and *mu* as in (8d). (Chao 1968, Li and Thompson 1981, Myers 2000).

(8) a. *yi* *jin* *mianfen*

one CL flour

'a catty of flour'

b. *yi* *bang* *rou*

one CL meat

'a pound of meat'

c. *san* *chi* *bu*

three CL cloth

'three (Chinese) feet of cloth'

d. *san* *mu* *tian*

three CL farmland

'three (Chinese) acres of farmland'

Type 2: Container Measures

They are nouns used as measures and thus form an open class. That is, nouns that have the meaning of a container (e.g., *bei* 'cup or mug,' *wan* 'bowl,' *ping* 'bottle or jar jam,' *he* 'box or case,' *dai* 'bag or sack') can be used as a container measure (Chao 1968, Li and Thompson 1981, Myers 2000). The nominal modification marker *de* is often found between a container measure and its following noun, e.g., *liang ping de niunai* 'two bottles of milk.'

(9) a. *yi* *bei* *cha*

one CL tea

'a cup of tea'

b. *yi* *wan* *fan*

one CL rice

'a bowl of rice'

c. *san* *lan* *li*

three CL pears

'three baskets of pears'

d. *yi* *he* *huochai*

one CL match

'a (small) box of matches'

yi *he* *de* *huochai*

one CL MO match

'a (small) box of matches'

Type 3: Partitive Measures

Partitive measures designate partitions or parts of objects rather than groups of them (Chao 1968, Myers 2000). In other words, any substance which takes 'part of object' classifier is having this part as its salient perceptual property. For instance, the phrase *yi kuai dangao* 'a piece of cake' as in (10a) denotes not only the quantity of the cake but also stresses the fact that this is a slice of cake, which is a portion of the whole one. See below for more examples.

(10) a. *yi* *kuai* *dangao*

one CL cake

'a piece of cake'

b. *yi pian mianbao*

one CL toast

'a slice of bread'

c. *yi di yu*

one CL rain

'a drop of rain'

d. *yi jie zhuzi*

one CL bamboo

'a section of bamboo'

Type 4: Group Measures

They differ from partitive measures in that they designate a group or collection of individuals (Chao 1968, Li and Thompson 1981, Myers 2000). Most group measures can take the modification marker *de* before a following noun.

(11) a. *yi shuang xie*

one CL shoes

'a pair of shoes'

b. *yi qun yang*

one CL sheep

'a flock of sheep'

c. *yi kun shuzhi*

one CL twigs

'a bundle of twigs'

d. *yi* *lie* *huoche*

one CL train

'a train'

In this section, we have discussed the linguistic properties of the Chinese count and mass classifiers. Count classifiers denote particular salient perceived characteristics in the nouns classified and carry information about the inherent traits of the noun referents being enumerated. Mass classifiers, by contrast, carry little information about the inherent properties of the noun referents being quantified. These classifiers merely denote the quantitative measurement and are imposed units rather than the natural units expressed by count classifiers.

We have also offered a classification (see Tables 2-1 and 2-2) of count and mass classifiers in terms of various semantic features. **Count classifiers** in the present study mainly are divided into two categories: animany and inanimacy. **Animacy classifiers** are further divided into human and nonhuman classifiers. The former comprises general human (*ge*) and honored human (*wei*) classifiers, whereas the latter consists of small animal (*zhi*) and bigger animal (*tou*) classifiers. **Inanimacy classifiers** are composed of three kinds of shape classifiers denoting one dimension (*tiao*, *gen*, and *zhi*, longness), two dimensions (*zhang*, *pian*, and *mian*, flatness), and three dimensions (*ge*, *ke* and *li*, roundness). On the other hand, **mass classifiers** can be divided into four categories: standard measures (*bang*, and *jin*), container measures (*bei*, and *wan*), partitive measures (*huai*, and *pian*), and group measures (*qun*, and *shuang*).

Table 2-1 Classification of Chinese Count Classifiers

Category	Type	Feature	Sub-Type	Sub-Feature	Example
Animacy	T1-1	human	T1-1-1	[−honored]	*ge*
			T1-1-2	[+honored]	*wei*
	T1-2	non-human	T1-2-1	[−prominent head]	*zhi*
			T1-2-2	[+prominent head]	*tou*
Inanimacy	T2-1	long saliently 1D	T2-1-1	[+flexible]	*tiao* +1D, +flexible
			T2-1-2	[−flexible]	*gen* [−cylindrical] +1D, −flexible *zhi* (枝) [+cylindrical] +1D, −flexible
	T2-2	flat saliently 2D	T2-2-1	[+flexible]	*zhang* +2D, +flexible
			T2-2-2	[−flexible]	*pian* +2D, −flexible* *mian* +2D, −flexible*
	T2-3	round saliently 3D	T2-3-1	[+big]	*ge* +3D, +big
			T2-3-2	[−big]	*ke* +3D, −big *li* +3D, −big

Table 2-2 Classification of Chinese Mass classifiers

Type	Example	
standard measures	*yi bang rou*	'a pound of meat'
	yi jin rou	'a catty of meat'
container measures	*yi bei cha*	'a cup of tea'
	yi wan fan	'a bowl of rice'
partitive measures	*yi kuai dangao*	'a piece of cake'
	yi pian[5] *tusi*	'a slice of toast'
group measures	*yi qun yang*	'a flock of sheep'
	yi shuang kuaizi	'a pair of chopsticks'

2.2 Previous Theoretical Studies of Classifiers in Chinese

In this section, I will review Tai and Wang's (1990), Tai's (1992, 1994), Cheng and Sybesma's (1998) studies on Chinese classifiers. Tai and Wang analyze the cognitive and syntactic distinction between count and mass classifiers. Cheng and Sybesma argue that the cognitive count-mass distinction should be grammatically reflected at the level of the classifier.

2.2.1 Tai and Wang (1990), Tai (1992, 1994)

Tai and Wang (1990:38) attempted to differentiate mass classifiers from count classifiers by proposing distinctions between them.

(12) **Classifier**[6] **and Measure Word Distinction:**

A classifier categorizes a class by picking out some salient perceptual properties, either physically- or functionally based, which are permanently

[5] Two classifiers *pian* and *kuai* can function as partitive classifiers as well as count classifiers (Tai 1992). When used as partitive measures, the two classifiers denote the 'part' of the noun referents instead of the whole. By contrast, when used as count classifiers, *pian* and *kuai* denote a particular quality in the noun classified. That is, *pian* refers to objects which are flat and thin whereas *kuai* refers to objects which are rigid and not round.

[6] Tai and Wang did not use the terms 'count classifier' and 'mass classifier.' Rather, the former was presented as 'classifier' or 'specific classifier' and the latter was regarded as 'measure word' in their papers.

associated with the entities named by the class of nouns; a measure word does not categorize but denotes the quantity of the entity named by a noun (Tai and Wang 1990:38).

This distinction has a cognitive basis in that while count classifiers refer to "relatively inherent or permanent properties" of an entity, mass classifiers refer to "contingent or temporary properties" (Tai 1992). For instance, a count classifier like *tiao* denotes the properties of being long, thin, cylindrical, and flexible, which are permanent or inherent properties associated with and shared by entities such as ropes, snakes, pants, or fish. *Tiao* picks out these properties and groups these entities into a set. A mass classifier like *bei* 'cup' does not denote any properties permanently or inherently associated with or shared by things such as water, rice, sugar, or flour. It simply denotes a measure of these things.

According to Tai and Wang (1990) and Tai (1992, 1994), the permanent and sustaining relationship between count classifiers and their noun referents contributes to different syntactic behaviors between count and mass classifiers. At a glance, both types of classifiers should be obligatorily present between the determiner/numeral and the noun. Mass classifiers resemble count classifiers not only in that they co-occur with numerals but in that they express units of enumeration. Nevertheless, Tai (1994) examined their syntactic differences—the *de* insertion and *ge* substitution. First, the modification marker *de* can optionally occur between a mass classifier (e.g., *xiang* 'box') and a noun (e.g., *shu* 'book'); but it cannot occur between a count classifier (e.g., *ben*) and a noun (e.g., *shu* 'book'):

(13) a. *wu xiang shu* → *wu xiang de shu*

five CL book five CL DE book

'five boxes of books' 'five boxes of books'

b. *wu ben shu* → **wu ben de shu*

five CL book five CL DE book

'five books' 'five books'

Second, the classifier *ge* is widely regarded as generalized and neutralized and is always used to replace other specific classifiers (Liu 1965, Ahrens 1994, Myers 2000). If *ge* is substituted for other classifier without changing the original numerical meaning, then this classifier belongs to count classifiers. On the other hand, if the numerical meaning changes, this unsubstituted classifier belongs to mass classifiers.

(14) a. *san gen xiangjiao* = *san ge xiangjiao*

three CL bananas three CL bananas

'three bananas' 'three bananas'

(same numerical meaning *gen*: count classifier)

b. *san jin xiangjiao* ≠ *san ge xiangjiao*

three CL bananas three CL bananas

'three catties of bananas' 'three bananas'

(different numerical meaning *jin*: mass classifier)

The cognitively-based distinctions between count and mass classifiers proposed by Tai and Wang (1990) and Tai (1992, 1994) effect a better understanding of the nature of categorization in the Chinese classifier system. Nonetheless, the syntactic grounds Tai (1994) argues pose a problem. According to Tai, mass classifiers can

co-occur with the modification marker *de*, whereas count classifiers cannot. This seems to counter to our intuition while some count classifiers such as *li* and *tiao* do take the modification marker *de*. For instance, these two classifiers can co-occur with *de* in sentences like *ta mai le yi he wu li de pingguo* 'He bought a box of five apples' and *wo yao xiao tiao de yu* 'I want the small fish.' Further investigation is still needed.

(15) a. *ta mai le yi he wu li de pingguo.*
He buy LE one CL-mass five CL-count DE apple
'He bought a box of five apples'

b. *wo yao xiao tiao de yu.*
I want small CL-count DE fish
'I want the small fish.'

2.2.2 Cheng and Sybesma (1998)

According to Cheng and Sybesma (1998), the count-mass distinction is indeed relevant in Chinese grammar. As described in Cheng and Sybesma's 1998 paper on Chinese classifiers and massifiers, count nouns refer to things that present themselves naturally in discrete countable units, while mass nouns refer to substances which do not present themselves in such units. Cheng and Sybesma claimed that, in contrast with English, where the cognitive count-mass distinction is grammatically reflected at the level of the noun, in Chinese the differences between mass nouns and count nouns are grammatically reflected at the level of the classifier. To be more specific, in English, count nouns can be counted by putting the numeral directly in front of nouns (e.g., ***five** apples*) but mass nouns can only be counted with the help of so-called measure word (e.g., *a **carton** of fruit juice*, *a **school** of fish*). In Chinese, on the other hand, all nouns, mass or count ones, are like English mass nouns in the sense that, in

order for a noun to be countable, a measure word or a classifier is always necessary, including for those whose counterparts in English would be count nouns. For instance, when Chinese mass nouns like *jiu* 'liquor' and *tang* 'sugar' are quantified, they have to co-occur with classifiers like *ping* and *wan*. Similarly, when Chinese count nouns like *ren* 'people' and *bi* 'pen' are enumerated, they also have to co-occur with classifiers like *ge* and *zhi*.

(16) mass nouns

a. *san* *ping* *jiu*
three CL-bottle liquor
'three bottles of liquor'

b. *san* *wan* *tang*
three CL-bowl soup
'three bowls of soup'

(17) count nouns

a. *san* *ge* *ren*
three CL people
'three people'

b. *san* *zhi* *bi*
three CL pen
'three pens'

Therefore, Cheng and Sybesma differentiate Chinese classifiers into two subcategories: the "count classifiers" and the "mass classifiers" and argue that while count classifiers are "individual classifiers" that provide information about how entities named by a noun are partitioned in a natural way, mass classifiers are

"non-individual" classifiers that "create a unit of measure" and are used to quantify portions of entities.

Cheng and Sybesma (1998) further maintained that, although both count classifiers and mass classifiers are nominals, count classifiers form a closed set with elements functioning solely as classifiers (e.g., *duo* for counting flowers). Mass classifiers do not form a closed set. The elements that constitute mass classifiers can occur as classifiers as well as independent nouns. For example, *bei* 'cup' is a small round container as well as a unit for measuring water.

Like Tai and Wang (1990), Cheng and Sybesma (1998) also provide arguments that count and mass classifiers differ syntactically in Chinese. For example, a classifier phrase (Numeral-CL-N) with a count classifier (CLcount) is structurally different from a classifier phrase with a mass classifier (CLmass). The syntactic facts listed by Cheng and Sybesma to demonstrate the count-mass distinction include the following. First, the 'optional' presence of *de*: Mass classifiers allow "the appearance of the modifier *de*" between the determiner/numeral and the noun whereas count classifiers do not allow the insertion of *de* between its preceding determiner/numeral. Therefore, a phrase such as *liang xiang de shu* 'two CLmass (box) of books' is grammatical, but the phrase *ba tou *de daxiang* 'eight CLcount (head) of elephants' is not. Second, the presence of adjectives: In a classifier phrase, it is possible for an adjective (e.g., *da* 'big' or *xiao* 'small') to occur between the numeral and a mass classifier such as in (18), yet it is impossible for the adjective to occur between the numeral and a count classifier such as in (19). In other words, the occurrence of an adjective in front of a classifier is sensitive to the kind of classifier involved: while count classifiers cannot be modified by an adjective, mass classifiers can. Consequently, the expression *liang da xiang shu* 'two big-CLmass (box) of books' such as in (18a) is grammatical, but the expression *yi *da wei laoshi* 'one

*big-CLcount teacher' such as in (19a) is not[7].

(18) a. *liang da xiang shu*

two big CL-box book

'two big boxes of books'

b. *yi xiao wan fan*

one small CL-bowl steamed rice

'a small bowl of steamed rice'

(19) a. **yi da wei laoshi*

one big CL teacher

'one *big-CL teacher'

b. **yi xiao zhi qianbi*

one small CL pencil

'one *small-CL pencil'

The analysis of Cheng and Sybesma (1998) provides an insightful approach to examining the features of Mandarin Chinese classifiers. Nevertheless, similar to Tai (1994), their syntactic arguments, namely the optional presence of *de* and the presence of adjectives, are problematic. Firstly, as mentioned earlier, some count classifiers as in (15) do allow the appearance of the modifier *de* between the numeral and the noun. Secondly, whether a classifier can co-occur with an adjective seems not a factor to differentiate count classifiers from mass ones. That is, both count and mass classifiers can co-occur with adjectives as shown in (20) and (21).

[7] Cheng and Sybesma (1999) also propose that count classifiers and mass classifiers actually behave differently syntactically. They claim that count classifiers are base-generated in CL position, while mass classifiers undergo N-CL movement.

(20) count classifiers

a. *yi da/xiao ke pingguo*

one big/small CL-count apple

'a big/small apple'

b. **yi hong ke pingguo*

one red CL-count apple

'a red apple'

c. *yi ke hong pingguo*

one CL-count red apple

'a red apple'

(21) mass classifiers

a. *wu xiang shu*

five CL-box book

'five boxes of books'

b. *wu da xiang shu*

five big CL-box book

'five big boxes of books'

c. **wu zhong xiang shu*

five heavy CL-box book

'five heavy boxes of books'

Interestingly, as revealed by (20) and (21), though both count and mass classifiers can co-occur with adjectives, it seems that the choice of adjective is constrained. That is, adjectives which occur in the left of the classifiers are limited to the ones denoting size, i.e., *da* 'big' and *xiao* 'small.' Further scrutiny about this issue is necessary.

2.3 Previous Empirical Studies on the Acquisition of Classifiers

How Chinese children acquire the intricate classifier system has been the interest of linguists studying child language acquisition. Research conducted by Fang (1985), Erbaugh (1986), Hu (1993), and Chien et al. (2003) has constituted a big step toward understanding classifier acquisition by Chinese children. These studies are of two kinds in terms of their methodology: longitudinal (Erbaugh 1986) and experimental (Fang 1985, Hu 1993, Chien et al. 2003).

2.3.1 Fang (1985)

Studies have shown that there is an order of classifier emergence and that Chinese children's proficiency in classifiers is closely related to their educational level, linguistic environment, and cognitive development (Ying and Chen 1983, Chang 1983). In his quantitative study of Chinese preschoolers' acquisition of classifiers, Fang (1985) attempted to address two research questions: (1) Do children from Mandarin, Cantonese, and bilingual (Mandarin and English or Cantonese and English) environments exhibit significantly different proficiency in classifiers? (2) What are the processes of these children's classifier acquisition?

The subjects, tested for their ability to use count classifiers in two tasks, were 36 Mandarin, 36 Cantonese and 30 bilingual speakers, divided into three age groups: four, five and six. In the first task, in order to investigate which classifiers children at a certain age had acquired, twelve pictures of familiar objects were used to elicit numerical constructions from children. Twelve classifiers denoting animacy, arrangement, function, and shape were expected with one stimulus for each classifier. In the second task, Fang tested children's comprehension (bilingual child subjects excluded) of four shape classifiers, viz *zhang*, *li*, *tiao*, *kuai*, among twelve novel objects with pseudo names. After hearing a stimulus containing a specific shape

classifier, the subjects were asked to select one appropriate object out of the four for that shape classifier. The same set of the four objects was repeatedly used for each of the four shape classifiers. There were three trials for each classifier. If a child was correct on all three trials, he or she was said to know the use of the classifier.

As predicted, the results of the first task showed that the children's proficiency in classifiers was significantly affected by their educational level, linguistic environment, and cognitive development. That is to say, the children's command of classifiers increased with age. Even though the four-year-olds' ability to use classifiers was poor, their ability improved quickly as they grew older. Interestingly, children at the age of four predominantly used the general classifier *ge*, and by the age of six they still used *ge* more often than other count classifiers. Furthermore, as shown by Table 2-3, influenced by English, the bilingual children exhibited lower proficiency than the monolingual ones despite the fact that all children, either bilingual or monolingual, tended to use the general classifier *ge* for almost any noun in production.

Table 2-3: Comparison of Monolingual and Bilingual Groups in Task One (Fang 1985)

age	**language**	**correct production of classifiers**			***ge* as a substitute classifier**		
		mean	standard deviation	T test	mean	standard deviation	T test
4y	monolingual	3.3	1.7	p<0.001	4.5	2.3	p<0.001
	bilingual	1.2	0.6		7.8	0.6	
5y	monolingual	5.6	1.7	p<0.001	2.3	1.9	p<0.001
	bilingual	1.4	0.5		6.3	2.9	
6y	monolingual	6.9	1.8	p<0.001	1.4	1.4	p<0.001
	bilingual	2.8	2.3		5.8	2.9	

As for the second task, the results shown in Tables 2-4 and 2-5 show that very few of the 4-year-olds demonstrated knowledge of any of the four shape classifiers tested. About half of the 5-year-olds knew two of the four classifiers, and almost all 6-year-olds knew all four classifiers. To put it differently, the children's classifier ability was found to be directly related to their cognitive development of abstract thinking and the power of generalization.

Table 2-4: Percentages of the Passing Subjects in Task Two (Fang 1985)

Age	language	*zhang*	*li*	*tiao*	*kuai*
4y	Mandarin	16.7	0	8.3	0
	Cantonese	25.0	16.7	33.3	8.3
5y	Mandarin	58.3	16.7	75.0	33.3
	Cantonese	75.0	83.3	91.7	66.7
6y	Mandarin	91.7	91.7	100.0	83.3
	Cantonese	75.0	91.7	100.0	66.7

Table 2-5: Number of the Correct Classifiers Used in Task Two (Fang 1985)

age	language	mean	standard deviation	T test
4y	Mandarin	0.25	0.59	p>0.1
	Cantonese	0.83	1.20	
5y	Mandarin	1.83	0.99	p<0.01
	Cantonese	3.16	1.28	
6y	Mandarin	3.67	0.75	p>0.3
	Cantonese	3.33	0.94	

Based on his findings, Fang proposed three acquisition processes. Children were claimed to first learn the general classifier *ge* within their grasp, then classifiers with narrow application (e.g., *ben* for counting books; *ke* for counting trees) and at last those with wide application (e.g., *zhang* denoting features such as "flat, rectangular, two dimensional and horizontal"; *kuai* denoting a large thick piece of something that does not have an even shape). For classifiers with narrow application, the children would treat the classifier and noun construction as an inseparable linguistic unit and learn them by simple memorization. For classifiers with wide application (the more difficult ones), the acquisition process would involve three steps: first, the mechanical memorization of the classifier-noun construction as an inseparable linguistic unit; then, the abstraction and generalization of the salient features of the classifier; finally, the application of the acquired rule to describe new objects and overgeneralization of the use of both general and specific classifiers.

Fang's study does shed some light on classifier acquisition. Nevertheless, this study is still in doubt at some points. First, he only designed one task for one study. It would be better if two tasks could be designed for one study, with one task supporting and echoing the other. In Fang's case, there were actually two different studies under the guise of two tasks. Second, Fang's proposal of acquisition processes implies that children's early classifier-noun sequence with classifiers of either narrow or wide application is an inseparable unit; their generalization and attaching meanings to classifiers with wide application will come later. If classifier-noun sequences are inseparable in children's early classifier constructions, then children may not be able to expand this sequence by inserting an adjective into the sequence. Therefore, whether children can separate the classifier-noun sequence needs to be further investigated.

2.3.2 Erbaugh (1986)

In her paper "Taking Stock: The Development of Chinese Noun Classifiers Historically and in Young Children," Erbaugh (1986) conducted a longitudinal study of Chinese children's acquisition in noun classifiers and stated that the historical semantic development of Chinese classifiers from 1,400 B.C. to the present[8] parallels both child acquisition and modern adult use. According to Erbaugh, Chinese classifier use is variable rather than categorical and obligatory. This can be attributed to the fact that Chinese noun classes have always been fuzzy sets, mutually overlapping, with quite variable references. Hence, certain nouns (i.e., *shitou* 'stone') can take several classifiers (such as *yi **li** shitou* 'a relatively small stone', *yi **ke** shitou* 'a small stone', *yi **kuai** shitou* 'a big stone') and even the same speaker may alternate among several classifiers without any evident meaning or stylistic contrast. Erbaugh further maintained that the children used the same core set of classifiers as the adults in identical discourse settings. They were almost as reliable as the adults in using classifiers wherever one was required. Even so, children overwhelmingly preferred the general classifier *ge*.

Erbaugh's subjects were four Chinese two-year-olds in Taipei, Taiwan, who were all from middle-class, urban, Mandarin-speaking mainlander families. She first selected two children, Lao Hu (male; age 2.0) and Zhong Rong (female; age 2.6), as the pilot study, and then the other two, Pang (female; from age 1.10 to age 2.10) and Kang (male; from age 2.10 to age 3.10), as the final longitudinal study. The data was collected through transcribed types of the four subjects at play with their families at home one hour every two weeks for each child for one year.

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[8] Based on the historical data, Erbaugh (1986) further pointed out the possibility that the classifier system might not be native to Chinese but rather borrowed from Thai, "possibly repeatedly over several periods of close historical contact and exchange of tribute and goods." Historically speaking, the enormous majority of objects classified have been concrete, discrete, and movable, as well as highly valued and culturally significant.

Under Erbaugh's observation, these children demonstrated a sound knowledge of the basic syntactic nature of classifiers at a very young age. It was found that her two participants (Pang and Kang) "were almost as reliable as the adults in using classifiers whenever one was required."

Erbaugh further divided children's classifier acquisition into three stages: (1) early use: the lexical stage, (2) later use: the prototypical stage, and (3) broadening use: generalization. Erbaugh proposed that children's early use of classifiers should be lexical in nature rather than feature-based. The results showed that children seemed to acquire specific classifiers first as lexical items. Then they would extend their use of specific classifiers from the most prototypical exemplars outwards to the peripheries of each category. Finally they would generalize classifiers to more members of the class.

To be more specific, **at the lexical stage**, Erbaugh's subjects almost never used specific classifiers before the age of 2.6. One child's (Pang's) early use of classifiers was lexical rather than feature-based, most of which referred to a single item rather than to a class. Pang did use each of her rare early classifiers correctly, yet there was no evidence that she saw them as defining noun classes. **At the prototypical stage**, the children's classifiers included potentially larger and more heterogeneous sets, but each new classifier typically appeared with its prototypical nominal referent first. It was at this stage that the children chose prototypes which were the most representative family members. For example, at age 2.6, both Zhong Rong and Pang had *ben* for books and *jing* for dresses. Kang used *kuai* for its prototypical referent, a piece of cloth. Once the children learned the prototypical referent, they chose a significant feature to **generalize** from. Later conventionalized use rests on this foundation. Shape (especially vertical extension and small size) were the most frequently generalized features. For instance, Pang correctly generalized *tiao* "long

thing" from snakes to boats to dragons.

Erbaugh also found that, both diachronically and developmentally speaking, classifier emergence order was as follows.

1. Valued items before ordinary ones. Early marking of animals, flowers, books, and weapons is prominent;
2. Concrete objects before abstractions and honorifics. A general classifier for concrete objects is also quite early;
3. Measures before special noun classifiers;
4. Unique reference before prototypical;
5. Length abstracted before flatness;
6. Use of classifiers with both number and noun before anaphoric use without noun.

Erbaugh's study of Chinese noun classifiers offers an interesting discussion of classifier acquisition and historical development. However, this study leaves the following to be desired. First, her sample size was small. Though she observed four children, in fact only the data of three children viz Zhong Rong, Pang and Kang were examined. Second, her subjects were too young (ages 1.10 to 3.10) to have acquired classifiers of different semantic domains such as animacy, function, and shape and their subcategories. This could be the reason why even by age three the children in her study still used very few specific classifiers of different semantic domains. They usually used the general classifier for nouns belonging to different semantic categories. Third, Erbaugh's longitudinal observation might not identify the classifiers that children had acquired, because a specific classifier is only obligatory when the noun of that semantic category is present. In natural settings, without appropriately-designed stimuli eliciting specific classifiers, it is possible that certain classifiers will not occur in the child's speech, even if the child had already acquired them.

2.3.3 Hu (1993)

Hu (1993) investigated the acquisition of the general classifier *ge* and twelve count classifiers[9] denoting animacy, function, shape and arrangement. She further explored the relative acquisition order of different classifiers and the development of semantic co-occurrence constraints on classifier-noun sequences. Also under investigation were the relation between children's comprehension and production of classifiers and the relation between their cognitive development and comprehension/ production of classifiers. Hence, Hu's study mainly addressed the following research questions.

1. Do children initially acquire the general classifier *ge* as a place holder? Are children's early classifier-noun sequences inseparable? Do children generalize the use of the general classifier widely or narrowly?
2. At what stage do children begin to acquire count classifiers? Is there a connection between perceptual saliency and the order of classifiers acquired? Does the acquisition of count classifiers block the use of general classifier? Are the semantic co-occurrence constraints on classifier-noun sequences generalized or learned item by item?
3. Is there any consistent order to the classifier acquisition from child to child, either in terms of different classifiers or classifier constructions? Which classifiers are acquired early?

[9] Hu's materials for classifiers are as follows.

SEMANTIC DOMAIN	Animacy				Arrangement	Function				Shape		
EXPECTED CLASSIFIER	*ge*	*wei*	*zhi*	*pi*	*shuang*	*liang*	*tai*	*ba*	*jian*	*tiao*	*zhang*	*ke/li*

4. What information is more accessible to children when they generalize the rules for classifier use, morphological information of nouns, or semantic classification of the noun referent?
5. Does the acquisition of some classifiers follow other cognitive attainments, such as the ability to perceive various physical dimensions, to categorize, to count and conserve numbers? Is there a correlation between children's cognitive development and classifier acquisition?

On the basis of the above research questions, Hu designed an experimental design which consisted of three production tests and four comprehension tests. The subjects were twenty-four Mandarin-speaking children from three to six years in age with an equal number of males and females. They were further divided into four age groups with six subjects in each group. First, each subject was given **three production tests** where numerical noun phrases (the *numeral + CL + noun* sequences) were elicited with visual stimuli and some assisting questions[10]. The visual stimuli consisted of line drawings of familiar, less familiar, or unfamiliar objects (imaginary objects with created names). The reason why the latter kinds of objects were chosen was to explore whether children could generate rules about classifier use even for nouns referring to less familiar or unfamiliar entities.

After the production tests, each child was given **four comprehension tests.** Inspired by Fang (1985), Hu employed the comprehension tests to probe into the children's understanding of certain classifiers, and their perceptual and categorizing ability. In the **first** comprehension test, the subjects were presented with the same objects of different shapes (one dimension, two dimensions, and three dimensions)

[10] For example, children were asked the question *Tupian li you duoshao X*? 'How many *X* are there in the picture?' Here *X* stood for the name of the object in the picture. A classifier was expected in the subject's responses to the questions.

and were asked to pick up an object based on the classifier they heard from the verbal stimulus[11]. All the objects in the same set had the same name (*xianpi-tang* 'rubber candy'), color, and texture; thus, the only distinction among them was their shapes. In addition, the subjects were tested about whether they were able to make a clear distinction between the classifier *pian* for small flat-thin objects and *zhang* for larger flat-thin. The children were presented a full piece of paper, a small piece of paper and a roll of paper and were asked to pick up an object according to the classifier they heard from the oral stimulus[12]. In the **second** comprehension test, the materials and the procedures were the same as the first comprehension test except that in this test adjectives rather than classifiers were used for the oral stimuli[13]. The subjects were asked to choose a shape to match the adjective given. In the **third** comprehension test which aimed to test the subjects' comprehension of classifiers denoting animacy, arrangement and function, each subject was presented two sets of five pictures separately and was instructed to complete the experimenter's spoken incomplete numerical noun phrase (e.g., *yi tou*...'one CL-larger animal...', *yi zhi*...'one CL-small animal...') by choosing an object from the set of five pictures. In the **last** comprehension test, an additional classification test was employed to investigate

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[11] An example of the verbal stimulus can be seen below:
(i) *Gei wo yi TIAO xianpi-tang*
Give me one CL (long-flexible) rubber candy.
'Give me a long piece of rubber candy.'
(ii) *Gei wo yi KE xianpi-tang.*
Give me one CL (small-round) rubber candy.
'Give me a small-round piece of rubber candy.'
(iii) *Gei wo yi PIAN xianpi-tang.*
Give me one CL (falt-thin) rubber candy.
'Give me a piece of rubber candy.'

[12] Sentence (i) is an example of oral stimuli.
(i) *Gei wo yi PIAN zhi.*
Give me one CL (piece) paper.
'Give me a piece of paper.'

[13] See sentence (i) below:
(i) *Gei wo yi ge CHANG de xianpi-tang.*
Give me one CL (general-thing) long rubber candy.
'Give me a LONG rubber candy.'

whether children at various ages had the ability to classify things based on common features[14], they were instructed to group together all pictures according to the given cues[15].

Hu's results were as follows. To begin with, the children seemed to acquire the general classifier from the syntactic distribution alone, because they used the general classifier regardless of the semantic property of the noun's referent. Hu's subjects used the general classifier with nouns of different semantic classes. Not only did they use *ge* with nouns referring to familiar, less familiar objects, and imaginary objects with created names, they even used it when they were not sure of the name of an object. Furthermore, although the children acquired the general classifier first, and acquired it through the syntactic distribution, they did not seem to consider the *numeral +CL+N* construction as an inseparable unit as Fang (1985) suggested. On the contrary, they generalized the general classifier widely with all noun phrases containing numerals. They could even drop or add an element in the *numeral +CL+N* construction. This was supported by the fact that by age three, the children could use three different types of numerical constructions (*numeral +CL*, *numeral +CL+N*, and *numeral +CL+ADJ+N*) correctly and with ease.

Second, it was observed in Hu's production data that children at age three used one or two count classifiers. Similar to Erbaugh's finding that children at 2;6 did not use any count classifiers, count classifiers seemed to emerge at around the age of three. In spite of the fact that the subjects at this age mostly used the general classifier, and very few count classifiers, the frequency and the number of different count

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[14] Five categories were tested: winged creatures, four-legged animals, vehicles, hand tools and clothing items.

[15] Sentence (i) is an example of the given cues:

(i) *Ba hui fei de zhichulai.*
'Show me those that can fly.'
Ba nenggou chuan de zhichulai.
'Show me those that people can wear.'

classifiers they used correlated positively with their age. As for the emergence order of count classifiers, it is suggested that the animacy classifier *zhi* might be one of the earliest acquired count classifiers. Table 2-7 shows the emergence order of early acquired count classifiers in Hu's experiment:

Table 2-6: The Emergence Order of Early Acquired Count Classifiers in Hu's (1993) Study

zhi (the animacy classifier) → ***shuang*** (the arrangement classifier) → ***pi*** (the classifier for hourse) → ***zhang*** (the shape classifier denoting two dimensions and thinness) → ***ba*** (the function classifier) → ***jian*** (the function classifier)

Notice that in Hu's study, the classifier *zhang* denoting two dimensions was among the early acquired classifiers and preceded the one-dimensional classifiers *tiao* (long-flexiable), *zhi* (long-rigid), and *gen* (long). These one dimensional classifiers also preceded the three-dimensional classifier *ke*. This 2-D, 1-D, 3-D emergence order differed from the results of Erbaugh (1984) and Fang (1985), where 1-D features were found more salient than 2-D features, and 2-D features were more salient than 3-D features.

Third, according to Hu, the semantics of the classifier becomes essential to children's acquisition of count classifiers and the co-occurrence constraints on classifier-noun sequences.

Fourth, contrary to the widely accepted notion that children's classifier development correlates with their cognitive development (Erbaugh 1982, Fang 1985), Hu's findings indicate a discrepancy between children's classifier production, comprehension and their cognitive ability. According to Hu's observation, children's perception of physical shapes and categorization abilities are in advance of their

ability to comprehend or produce the relevant classifiers. That is, they perceive and categorize objects much better than they comprehend and produce relevant classifiers. Hence, children's abilities to perceive different shapes and to categorize objects based on semantic properties do not necessarily guarantee the acquisition of either the relevant shape classifiers, or the classifiers denoting corresponding categorical properties. In other words, the order of perception of different shapes does not parallel the emergence of shape classifiers. Nor does the children's categorization ability parallel the emergence order of classifiers denoting the same categories.

In her attempt to investigate the Chinese children's acquisition of count classifiers, Hu succeeded in conducting a systematic study and answering the research questions she set. Nonetheless, there are methodological problems that need improving. Firstly, her sample size was small with six subjects in one age group totaling twenty-four children. In addition, there were an unequal number of trials for different classifiers in the four comprehension tests—two trials for the comprehension of shape classifiers and only one trial for the other three comprehension tests.

2.3.4 Chien et al. (2003)

Following Cheng and Sybesma's claim that in Chinese the cognitive count-mass distinction is grammatically reflected at the level of classifiers, Chien et al. (2003) examined Chinese children's comprehension of count classifiers and mass classifiers. The objectives of this study were twofold. One was to test whether Chinese children, at early stages of language acquisition, possess knowledge of the grammatical count-mass distinction. If so, then they should apply count classifiers to individuated objects and mass classifies to mass-like substances. The other was to test whether Chinese children, at early stages of development, have the ability to make relatively fine distinctions in comprehension between and among fourteen count

classifiers.

Chien et al. examined 80 Chinese-speaking children between the ages of 3 and 8, and 16 adults, who served as the comparison group. All the participants came from Taipei, Taiwan, and were sampled from day-care centers, nursery schools, kindergartens, and elementary schools. Additionally, the children were assigned to one of five different age groups (G1 to G5) with one-year interval. Hence, there were sixteen children in each age group.

In order to answer the above research questions, Chien et al. conducted two comprehension experiments which were identical in methodology and design, but each tested a different set of classifiers. Totally, fourteen count classifiers and four mass classifiers (all container measure words) were selected. Table 2-8 provides details of the count and mass classifiers in each experiment and their respective meanings. The subjects involved were told to play a guessing game with the experimenter and the cartoon character Mickey Mouse (a stuffed animal). For each turn in the guessing game, the experimenter would show Mickey Mouse three different things, and then Mickey Mouse would pick up one thing he wanted. The child was asked to guess what Mickey Mouse wanted and pointed it to the experimenter.

Table 2-7: Count Classifiers and Mass Classifiers Used in Chien et al. (2003)

	Meanings
	Experiment 1
Count classifiers	
zhi	CL for something long, thin, cylindrical, and rigid
zhang	CL for something with a thin, flat, rectangular, and two-dimensional extended surface
ke	CL for plants
ding	CL for hats and sedan chairs
liang	CL for vehicles
tiao	CL for something (animate or inanimate) long, thin, cylindrical, and flexible
ge	the general CL
Mass classifiers	
bei	cup or mug
wan	bowl
	Experiment 2
Count classifiers	
jian	CL for clothing items and the superordinate categorical names such as 'tools', 'furniture', or 'weapon'
zhi	CL for most animals (non-human)
ben	CL for bound volumes
duo	CL for flowers or clouds
kuai	CL for a chunk, a lump, or a piece of something
gen	CL for something long, either rigid or flexible
pian	CL for something thin, or a slice of something
Mass classifiers	
ping	bottle or jar jam
bao	bag

Notice that a count classifier or a mass classifier was embedded in Mickey Mouse's requesting sentences. A sample setting for the comprehension task is as follows.

(22) *Zhe shi qiche, zhe shi shu, zhe shi shui.*

This is car, this is book, this is water

Milaoshu shuo ta yao yi-liang something.

Mickey Mouse say he want one-CL_{count} something

Gaosu laoshi Milaoshu yao yi-liang sheme.

Tell teacher Mickey Mouse want one-CL_{count} what

'This is a car, this is a book, this is water. Mickey Mouse says that he wants something (vehicles denoted by the CL_{count} *liang*). Tell teacher (i.e., the experimenter) what Mickey Mouse wants.'

If a child comprehended the grammatical count-mass distinction, then he or she would choose an entity corresponding to a count noun in the count-selective context (i.e., numerical constructions with a count classifier and an unknown noun, e.g., *Milaoshu shuo ta yao yi-**duo*** something) and an entity corresponding to a mass noun in the mass-selective context (i.e., numerical constructions with a mass classifier and an unknown noun, e.g., *Milaoshu shuo ta yao yi-**ping*** something).

Chien et al.'s results provided evidence for children's knowledge of the count-mass distinction at their early stages of language acquisition, and cohered with the linguistic analysis that the count-mass distinction is represented in Chinese grammar at the level of the classifier, as suggested by Cheng and Sybesma (1998). Such count-mass distinction, as revealed in this study, is available to their subjects at early stages of Chinese language acquisition. Their subjects predominately used an entity corresponding to a count/mass noun when provided a count/mass selective context and "rarely mistakenly used count classifiers to quantity substances or use mass classifiers to enumerate individuated objects." (Chien et al. 2003, p.113) In addition, the subjects were able to draw subtle differences between and among

fourteen count classifiers and their respective corresponding referents. They knew that the relationship between a count classifier and an entity denoted by a noun is relatively fixed. Interestingly, comparing the results of count and mass classifiers, Chien et al. found that these children's abilities in dealing with count classifiers and mass classifiers were roughly comparable[16].

In order to become a conventional speaker of Mandarin Chinese, a child faces the challenge of acquiring all aspects of the intricate classifier system. It has been found that children's acquisition of classifiers is not complete until the end of the preschool years (Fang 1985). Chien et al.'s study, echoing Fang (1985), also found that there were developmental differences among Chinese children's abilities to comprehend count and mass classifiers. The older the children were, the better they performed. But even so, these differences tended to fade by age four.

Finally, it was found that the general classifier *ge* posed the biggest problem in the comprehension task. Young children mainly used the general classifier *ge* for almost every noun. They tended to overuse the general classifier *ge* and allow it to co-occur with nouns regardless of different semantic properties denoted by their referents. The "*ge*-preference" was seen even in the production of the adult subjects.

In conclusion, Chien et al.'s results confirmed that young children are highly adept in comprehending the grammatical count-mass distinction and that they have equal abilities in dealing with count classifiers and mass classifiers. Nonetheless, there are still some problems with their research. To begin with, even though they randomly selected fourteen count classifiers and four mass classifiers from among the top thirty classifiers produced by adults, they failed to give a detailed classification of such classifiers. In other words, is there a hierarchy of difficulty in Chinese children's

[16] Combining the results of Experiments 1 and 2, children performed slightly better for mass classifiers (81.10%) than count classifiers (78.84%); however, the difference was not statistically significant: $F(1,75) = 2.46$, $p > .05$.

acquisition of count and mass classifiers? What is the semantic feature, either within-category or cross-category, governing such hierarchical use of count and mass classifiers? These questions were not addressed in their study.

Second, Chien et al. focused mainly on children's acquisition of mass classifiers related to containers (e.g., *bei* 'cup' or *ping* 'bottle or jar'). There are other types of massifiers such as units for measuring length, volume, or weight (e.g., *chi* 'meter,' *gongsheng* 'liter,' or *bang* 'pound'), group measures (e.g., *qun* 'crowd, group, or school' or *dui* 'pile') or partitive measures (e.g., *kuai* 'piece,' or *pian* 'slice'). Do children perform similarly in their acquisition of such mass classifiers? This question is worth investigating. Also, Chien et al.'s research consisted mainly of two comprehension experiments. Whether children respond differently to the count/mass distinction in the production task still remains unknown.

2.4 Summary of Chapter Two

In this chapter, we have discussed the linguistic properties of the Chinese count and mass classifiers. Also, we have offered a classification of count and mass classifiers in terms of various semantic features. Besides the discussion and classification of count and mass classifiers, we have reviewed four major linguistic analyses of Chinese classifiers (i.e., Tai and Wang 1990, Tai 1992, Tai 1994, Cheng and Sybesma 1998)[17]. Tai and Wang (1990) and Tai (1992, 1994) attempted to differentiate mass classifiers from count classifiers by proposing their semantic and syntactic distinctions. Cheng and Sybesma (1998) maintained that in Chinese the difference between mass nouns and count nouns should be grammatically reflected at

[17] Myers (2000) also investigates the Chinese classifier system, particularly the general classifier *ge*. He argues that *ge* is the unique 'general' classifier selected by a default rule whereas the remaining 'specific' classifiers are selected by analogy with exemplars. To put it differently, *ge* is not controlled by analogy. If speakers cannot find an exemplar in memory that goes with a specific classifier, then they will use *ge*. Specific classifiers, on the other hand, are processed by analogy.

the level of classifiers and thus differentiated Chinese classifiers into two categories: count classifiers and the mass classifiers.

Four empirical studies on language acquisition of Chinese classifiers were reviewed in this chapter as well. Fang (1985) investigated Mandarin, Cantonese and bilingual children and attempted to find out if children from different linguistic environments and developmental stages exhibit significantly different proficiency in the use of classifiers. The results confirmed that children's proficiency in classifiers was strongly influenced by their educational level, linguistic environment and cognitive development. Erbaugh (1986) conducted a longitudinal study of Chinese children's acquisition of noun classifiers and showed that children demonstrated a sound knowledge of the basic syntactic nature of classifiers at a very young age. Hu (1993) examined children's acquisition of the general classifier *ge* and eleven count classifiers denoting animacy, function, shape and arrangement. She also explored the emergence order of classifiers denoting properties of different semantic domains and the relation between children's cognitive development and their classifier acquisition. Chien et al. (2003) examined children's comprehension of count and mass classifiers and claimed that these young children honored the grammatical count-mass distinction.

Nonetheless, the acquisition of Chinese classifiers is still one of the most understudied areas in child language acquisition. First, previous studies failed to provide a clear and comprehensive overview of children's comprehension and production of classifiers. Some only focused on children's correct use of classifiers in production or in comprehension, rather than both comprehension and production. Furthermore, the empirical studies reviewed above were mainly concerned with count classifiers rather mass classifiers. Even though Fang (1985) and Hu (1993) conducted

sub-studies[18] to explore their subjects' comprehension of classifiers, both studies dealt exclusively with count classifiers, and hence shed no light on children's comprehension of mass classifiers. Chien et al. (2003) did examine children's comprehension of mass classifiers. However, their study mainly focused on children's comprehension of container measure words, not other types of mass classifiers.

Based on the linguistic properties and the previous studies reviewed in this chapter, we will present the methodology and the experimental design of the present study in Chapter Three.

[18] Fang, in one sub-study, tested 36 four to six year-old Mandarin speaking children's comprehension of four shape classifiers whereas Hu, in two sub-studies, investigated the relation between production and comprehension with 24 children aged between three and six.