Chinese ESL Learners' Understanding of the English Count-Mass Distinction

Dongfan Hua and Thomas Hun-tak Lee
Shanghai International Studies University and Hunan University

This paper investigates Chinese ESL learners' understanding of the English count-mass distinction. We first examine the parametric difference between English and Chinese with respect to noun denotations, and discuss related issues of L2 learning. Next, we report findings on learners' knowledge of the diagnostic environments for count and mass nouns, their awareness of the singular count noun rule, as well as their understanding of the semantics of count-mass distinction. Finally, we conclude with several generalizations about the Chinese learners' acquisition of the English count-mass distinction.

1. The count-mass distinction in English and Chinese

It is well known that the count-mass distinction in English is defined according to morphological and syntactic criteria rather than ontological distinctions (Quine 1960, Gleason 1965, Pelletier 1975, McCawley 1975, Quirk 1978, Allan 1980, Mufwene 1984, Bunt 1985, Gordon 1985, 1988, Gathercole 1986). As shown in (1-3), count nouns such as *computer* and *idea* can be pluralized; they can be enumerated by cardinal numerals and the fuzzy quantifier *many*; they can also be modified by the distributive universal quantifiers *every* and *each*, and the disjunctive quantifier *either*. Mass nouns such as *water* and *evidence*, on the other hand, cannot be enumerated; mass nouns generally occur in the singular and do not pluralize, and are selected by the fuzzy quantifiers *much* and *a little*.

(1) a. Two computers/many computers/every computer/both computers
    b. Three ideas/many ideas/each idea/either idea
(2) a. Much water/a little water
    b. Much evidence/a little evidence
(3) a. *Much computer/*much idea/*a little computer/*a little idea[1]
    b. *Two waters/*two evidences/*each water/*each evidence

It is clear from these examples that the distinction arises from differences in how the two types of nouns denote things in the world, and is not derivable from ontological properties of the noun referents. Count nouns can be both concrete and abstract, and so can be mass nouns. Thus the nouns *computer* and *water* denote concrete object and concrete substance respectively, though the former is count whereas the latter is mass. Likewise, whereas the nouns *idea* and *evidence* both denote amorphous abstractions, the former is count while the latter is mass.

(4) a. I bought *(a/the) computer/ I bought computers.
    b. As we know, *(a/the) computer is an electronic device/Computers are electronic devices.
    c. This is *(a) computer/These are computers.

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[1] The phrases *a little computer* and *a little idea* are of course well-formed if *little* is understood as an adjective modifying the following noun.

 Proceedings of the 7th Generative Approaches to Second Language Acquisition Conference (GASLA 2004), ed. Laurent Dekydtspotter et al., 138-149. Somerville, MA: Cascadilla Proceedings Project.

A further distributional difference between count and mass nouns in English concerns the inability for count nouns to occur in the singular without a determiner, as illustrated in (4). Count nouns must either be plural or be preceded by a determiner; bare singular count nouns are prohibited. This strict syntactic requirement, known as the singular count noun rule, applies irrespective of whether the count NP in question denotes an individual, as in (4a), or a kind, as in (4b), or functions as a predicate, as in (4c).

Chierchia (1994) proposes a way to conceptualize the count-mass distinction in English and capture the distributional characteristics of these two classes of nouns. It is argued that count and mass nouns draw from two separate semantic domains for their denotations. A count noun denotes a set of individuals or atoms and subgroups formed from these individuals. A mass noun, on the other hand, denotes only portions of stuff, and fusions of portions of stuff, and its denotational domain does not consist of individuals. It is argued that all languages have a mass domain for noun denotations. However, languages differ in whether a count domain is available for noun denotations. Languages like English have both a count semantic domain and a mass semantic domain, whereas languages like Chinese have only a mass semantic domain.

The above postulations allow us to account for the distributions of count and mass nouns in English. Count nouns can be enumerated and pluralized, since they denote individuals or atoms. Mass nouns cannot be enumerated because they do not denote individuals. Further, if one follows Chierchia (1998) in assuming that singular count nouns cannot denote kinds, and only mass nouns and plural count nouns are able to do so, the prohibition against singular count nouns in sentences such as (4b) have a ready explanation.

It has been suggested by various semanticists (e.g. Bach 1989, Chierchia 1994, 1998) that Chinese nouns do not encode a count-mass distinction, and that all nouns in Chinese are mass nouns. The enumeration and quantification of Chinese nouns require the presence of classifiers, as can be seen from (5) and (6). On this view, classifiers can be seen as ways of individuating or measuring the mass denotations provided by the nouns. In the case of the words meaning "computer table" and "idea" in (5), the sortal classifiers *zhang* and *ge* individuate the denotations of *diannao* and *xiangfa* so that enumeration and quantification are possible. In the examples in (6), the classifiers meaning "glass" and "item" provide units of measure for quantizing the denotations of the words *shui* and *zhengju*, meaning "water" and "evidence" respectively.

(5) a. San *(zhang) diannaozhuo[2]
Three CL computer-table
"Three computer tables"

b. Mei *(ge) xiangfa
Every CL idea/thought
"Every idea/thought"

(6) a. Liang *(bei) shui[3]
Two glass water
"Two glasses of water"

b. Ji *(xiang) zhengju
Several item evidence
"Several items of evidence"

The view that all nouns in Chinese draw from a mass domain has two desired consequences, namely, that number morphology is lacking in the language. First, since all nouns are mass in Chinese, and draw on the mass domain, they do not denote individuals, and cannot be pluralized, just as mass nouns in English cannot.[4] Secondly, since mass nouns can denote kinds, bare NPs can occur as

[2] CL=classifier; z*hang*= classifier for thin, flat objects; *ge*= general sortal classifier.

[3] The classifiers *bei* "glass" and *xiang(mu)* "item" are also nouns in their own right.

[4] The plural suffix *-men* in Chinese has a restricted distribution. It can be attached to pronouns such as *wo* "I/me", *ni* "you (singular)" and *ta* "s/he", to give *wo-men* "we/us", *ni-men* "you (plural)", and *ta-men* "they/them". The suffix can also be attached to certain human nouns to form plural NPs such as *laoshi-men* "teachers", *pengyou-men* "friends". As observed by Li (1999), once the noun is pluralized by *-men*, it cannot be enumerated. Thus the phrases **san-ge laoshi-men* "three-CL-teachers" and **liang-ge pengyou-men* "two-CL-friends" are ill-formed.

arguments in Chinese, in addition to being able to function as predicates. In (7) the noun for "computer" is a bare NP denoting a kind. In (8) the noun for "computer" preceded optionally by a numeral and a classifier functions as a predicate. As shown in (9), when a noun denotes a kind, it must be bare and cannot be modified by a numeral plus a classifier.

(7) Diannao shi (yi zhong) dianzhi shebei
Computer be (one kind) electronic equipment
"(A) computer is a kind of electronic equipment"
(8) Zhe shi diannao/ zhe shi yibu diannao
This be computer/this be one-CL computer
"This is (a) computer"
(9) (*Yibu) diannao shi (yi zhong) dianzhi shebei
One-CL computer be (one kind) electronic equipment
"A/the computer is a kind of electronic equipment"

Scholars who work on Chinese since Chao (1968) have argued that while indeed nouns are not marked for the count-mass distinction, this does not mean that the count-mass distinction is not relevant to Chinese nominal syntax. The view put forward by Chao, and more recently by Cheng and Sybesma (1998, 1999) says that the count-mass distinction in Chinese is encoded not in nouns, but in the classifier system. In general, classifiers can be divided into two broad classes, sortal classifiers, also called individual classifiers, which encode ontological properties of the referents of the nouns that they select, and mensural classifiers, which are typically nouns in their own right, and provide units of measure for counting the noun denotations. Thus, the sortal classifier *zhang* in (5) selects nouns whose referents are thin, flat objects. The mensural classifier *bei* and *xiang* are units of measure and can stand on their own as nouns. It has been suggested by Cheng and Sybesma (1998, 1999), that the sortal classifiers correspond to count-classifiers, and the mensural classifiers correspond to mass-classifiers. The distinction between count and mass classifiers is reflected in differences in syntactic distribution such as whether a nominalizer can be inserted between the classifier and the noun.[5]

2. Issues in the L2 learning of the English count-mass distinction

The major task facing the L2 learner of English with regard to the count-mass distinction is to become sensitive to the distributional environments of the count and mass nouns, which, as we have seen, can be largely derived from the denotational differences of these nouns. Further, the learner needs to learn that bare singular count nouns cannot denote kinds and cannot stand alone as argument NPs.

For the Chinese learner of English, it is an open question whether the count-mass distinction encoded in classifiers in Chinese will transfer to their learning of the English count and mass nouns. If the categorial distinction between count-classifiers and mass-classifiers does not affect the learning of English count and mass nouns, will the learner acquire this noun subcategorization on an item by item basis, or will learners rely on the ontological properties of the noun referents so that in the absence of positive evidence, they will assume that solid discrete objects are mapped onto count nouns, and nonsolid amorphous substance is mapped onto mass nouns?

Chinese learners will find it difficult to acquire the singular count noun rule, since as we have seen, Chinese allows bare nouns to denote kinds. To acquire English nominals, the Chinese learner will have to unlearn the Universal Grammar option that bare nouns can denote kinds in some languages, an option available in their L1. Examples of errors of violation of the singular count noun rule are easily found in the spontaneous productions of Chinese L2 learners, as can be seen from (10), taken from the writings of university English majors.[6]

[5] Chien, Lust and Chiang (2003) report experimental evidence showing that young Chinese children have knowledge of the semantic difference between count-classifiers and mass-classifiers.
[6] Examples of L2 errors of count-mass usage can also be found in George (1972).

(10) a. *Problem arises.
b. *Most of these people live in congested urban area.
c. *Idea is the foundation of ideational theory.

Two additional complexities in the learning of the count-mass distinction should be mentioned. First, many nouns have both count and mass uses corresponding systematically to different senses. The nouns in (11) illustrate this ambiguity: their count use denotes an individuated object carrying or embodying the attribute concerned; the mass use denotes the attribute itself. A second complication is that as observed by functional and cognitive linguists (Hopper and Thompson 1984, 1985, Langacker 1987), the singular count noun rule may be relaxed if the noun occurs in referentially non-salient positions such as non-argument positions. Bare singular count nouns are found in prepositional object positions and inside derived nominals, as shown in (12).[7] In our paper, a NP is said to be referential when the speaker has a specific entity or a delimited set of entities in mind when using the NP. An NP that is not used referentially is non-referential.

(11) *Time, thought, truth, action, theory, shape*
(12) *At school/car-racing*

Our study is divided into three parts. Part I of the study examines learners' sensitivity to the count and mass contexts of English nouns. We focus on two research issues, namely, (a) the extent to which advanced L2 learners are sensitive to the selective contexts for count and mass nouns in English; and (b) whether the concrete-abstract ontological distinction will have any effect on the learners' cognition of the count-mass status of nouns. Part II of the study explores (a) the extent to which ESL learners have mastered the singular count noun rule; and (b) whether learners' sensitivity to the singular count noun rule depends on referentiality. Part III investigates learners' sensitivity to the semantic distinction between count and mass uses of the same noun.

3. Part 1 of the Study

3.1. Methods and procedure

In Part 1 of the study, we used a grammaticality judgment task involving 20 nouns. 8 of them were count, 8 mass, and 4 collective. With regard to noun denotations, half of the count nouns and half of the mass nouns denote concrete entities, while the remaining half denote abstract entities, as shown in Table 1. The count and mass concrete nouns differ in that the former denote concrete solid objects whereas the latter concrete substance.

Table1. Nouns used in the grammaticality judgment task of Part I

Count	Concrete	*computer, dictionary, mobile phone, credit card*
	Abstract	*sentence, idea, month, dilemma*
Mass	Concrete	*water, beef, rice, smoke*
	Abstract	*work, information, evidence, help*
	Collective	*furniture, equipment, data, stationery*

The 20 nouns were embedded in two count contexts: one in which the nouns were preceded by a numeral and one in which the nouns were preceded by the fuzzy quantifier *many*. The same nouns also included a mass context, with the nouns preceded by the fuzzy quantifier *much*. This gave a total of 60 test sentences (20 nouns × 3 contexts), exemplified in (13-21). The subjects were asked to give one of three judgments to each of the test sentences: grammatical, ungrammatical, not sure.[8]

[7] Hopper and Thompson (1984) include the incorporation of obliques and noun compounding as ways in which NPs may lose their prototypical referential usage.

[8] It should be noted that learners' judgments of a particular test sentence may be based on factors other than their sensitivity to the count-mass status of a target noun embedded in a sentence. However, as will be seen later, we are comparing subjects' responses to test sentences that differ minimally with respect to a count-mass distributional

Table 2. Count- and mass-selective contexts used in Part I

Count-selective	Mass-selective
many	*much*
cardinal numeral	

(13) Count nouns in count-selective contexts (numerals)
   a. Four computers in the private study area exploded this afternoon, injuring a number of students.
   b. One sentence on the first page of William Faulkner's novel "The Sound and the Fury" was extremely difficult to understand.

(14) Count nouns in count-selective contexts (*many*)
   a. Not many computers in the private study area exploded this afternoon, but a number of students were injured.
   b. Not many sentences on the first page of William Faulkner's novel *The Sound and the Fury* were easy to understand.

(15) Count nouns in mass-selective contexts (*much*)
   a. *Not much computer in the private study area exploded this afternoon, but a number of students were injured.
   b. *Not much sentence on the first page of William Faulkner's novel *The Sound and the Fury* could be understood by the beginner.

(16) Mass nouns in mass-selective contexts (*much*)
   a. The neighbors did not see much smoke coming out of the chimney of Mr. Ramsey's house; this suggests that he was often away from home.
   b. The detective was not able to find too much evidence in support of the charges against the arrested robbers.

(17) Mass nouns in count-selective contexts (numerals)
   a. *The neighbors saw ten smokes coming out of the chimney of Mr. Ramsey's house; this suggests that he was inside the house.
   b. *The detective found three evidences in support of the charges against the arrested robbers.

(18) Mass nouns in count-selective contexts (*many*)
   a. *The neighbors did not see many smokes coming out of the chimney of Mr. Ramsey's house; this suggests that he was often away from home.
   b. *The detective was not able to find too many evidences in support of the charges against the arrested robbers.

(19) Collective (mass) nouns in mass-selective contexts (*much*)
   The chemistry laboratory did not acquire much equipment in the last three years.

(20) Collective (mass) nouns in count-selective contexts (numerals)
   *The chemistry laboratory acquired ten equipments in the last three years.

(21) Collective (mass) nouns in count-selective contexts (*many*)
   *The chemistry laboratory did not acquire many equipments in the last three years.

The test subjects included three groups of ESL learners in Shanghai: senior high school students (N=9), first- and third-year university English majors (N=15 for each group). The subjects also included a group of 17 first- and second-year university students in Hong Kong. In addition, a group of 6 native speakers served as control. The subjects chosen for the experiment all completed a word translation test, which indicated that they were familiar with the meaning of the English count and mass nouns used in the test. The mean numbers of acceptances were computed for each subject group, and the data are presented in Tables 3A and 3B.

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property, for example, whether the noun can be modified by a count quantifier or mass quantifier, or whether the noun is determined or bare. In such a design, systematic differences in subjects' responses to these minimally different test items should be attributable to learners' knowledge of the count-mass distinction, or their knowledge of the singular count noun rule.

3.2. Findings

As shown in Table 3A, university students' judgments of count and mass nouns in compatible contexts are similar to those given by native speakers, with mean numbers of acceptances mostly well exceeding 3.[9] Senior high school learners did not judge as accurately as university students.

Table 3A. Mean numbers of acceptances for count nouns in count contexts, and mass nouns in mass contexts (maximum=4)*

			SH	U1	U3	HKU	Native
Count	Concrete	numeral	2.22	3.33	3.40	3.47	3.67
		many	3.22	3.27	3.47	3.65	3.17
	Abstract	numeral	2.33	2.80	2.93	3.35	4.00
		many	1.89	3.33	2.93	3.18	3.33
Mass	Concrete	*much*	2.89	3.33	3.67	3.65	2.67
	Abstract	*much*	2.56	3.13	3.53	3.35	2.50
	Collective	*much*	2.11	3.27	3.27	2.41	3.17

*SH=Senior high students
U1=First-year university students in Shanghai
U3=Third-year university students in Shanghai
HKU=First- and second-year university students in Hong Kong
Native=Native English speakers

Table 3B shows how the subjects judged the count and mass nouns in incompatible contexts. The lower the acceptance rate, the better the relevant types of nouns were acquired. We find that the university students generally gave low acceptance rates for count nouns in mass contexts, their acceptance rates ranging from 0.2 to 1.53. Likewise, they generally gave low acceptance rates for mass nouns occurring in count contexts, their acceptance rates ranging from 0.33 to 1.73. High school students followed a similar pattern.

Table 3B. Mean numbers of acceptances for count nouns in mass contexts, and mass nouns in count contexts (maximum=4)

			SH	U1	U3	HKU	Native
Count	Concrete	*much*	0.78	0.40	0.20	0.47	0.17
	Abstract	*much*	1.89	1.53	1.13	1.24	0.33
Mass	Concrete	numeral	1.11	1.13	0.40	0.71	0.33
		many	0.44	1.07	0.37	0.82	0.00
	Abstract	numeral	1.44	1.73	0.80	1.65	0.00
		many	0.44	0.87	0.33	1.65	0.00
	Collective	numeral	1.44	1.47	0.67	1.71	0.17
		many	0.67	1.73	0.73	1.65	0.17

It is interesting that while the learners across all levels gave low acceptance rates for count and mass nouns in incompatible contexts, their acceptance rates were different for concrete and abstract nouns. In the case of count nouns in the mass context, learners accepted test sentences much more when the nouns were abstract than when they were concrete. This difference was statistically significant for the university learners (1.53 vs. 0.40, t=4.43, p=.001 for U1 students; 1.13 vs. 0.20, t=4.53, p=.000 for

[9] The native speakers' low level of acceptance of the mass nouns in mass-selective contexts was contrary to expectation. On closer examination of the data, it was found that only one of the six native speaker subjects accepted the test items (a) and (b), which contributed to the low acceptance rates. One may conjecture that the use of the non-assertive subject NPs was not favored by the native speaker.

(a) Not much beef could be sold these days, because people were afraid of the mad cow disease.
(b) Not much information about the war could be collected by the journalists because they were prevented from going to the battlefield.

U3 students; 1.24 vs. 0.47, t=3.49, p<0.005 for HKU students).

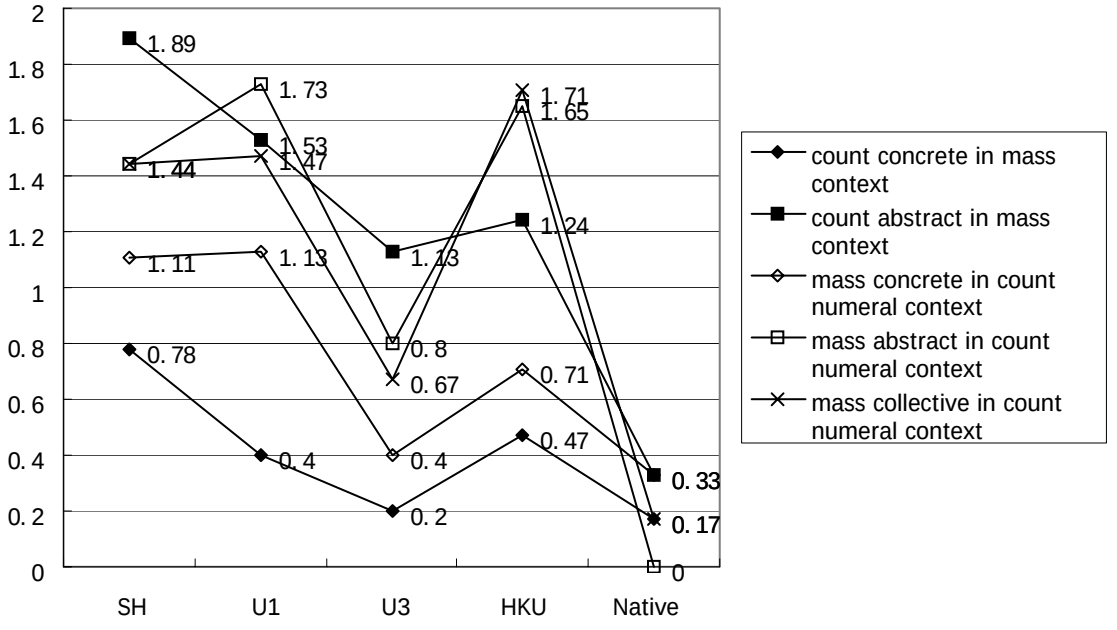

Figure 1. Mean numbers of acceptances of concrete and abstract nouns in incompatible contexts

For mass nouns occurring in incompatible count contexts, learner judgments were relatively more accurate in the fuzzy quantifier *many* context than in the numeral context. Moreover, acceptance rates given by the Shanghai subjects for the mass abstract and collective nouns were generally slightly higher than the mass concrete nouns in the numeral context. This tendency for mass abstract and collective nouns to receive higher acceptance rates in the numeral context was more pronounced with Hong Kong university learners.[10] The rates for the mass abstract and collective nouns were 1.71 and 1.65, whereas the rate for the mass concrete nouns was 0.71. The difference reached statistical significance (t=4.02, p=.001; t=3.67, p=.002).

Figure 1 shows the effects of the concrete-abstract ontological distinction on learners' judgments of count and mass nouns in incompatible contexts. As shown in Figure 1, count concrete nouns received the lowest acceptance rates across all learner levels when they appear in mass contexts. Mass concrete nouns in the count numeral contexts received the lowest acceptance rates of the three types of mass nouns. Count abstract, mass abstract, and collective nouns were judged quite similarly across all learner levels.

The reason why count concrete nouns in the mass context received the lowest acceptance rates is that they have prototypical count denotations, i.e. they denote individuated objects. The reason why mass concrete nouns in the count numeral contexts received the lowest acceptance rates, compared with the other two types of mass nouns, is that the mass concrete nouns used in the test denote substances, which are prototypical mass denotations.

The collective nouns used in the test ontologically denote individuated objects, and should therefore be expected to be more compatible with the count numeral context than mass concrete nouns that denote substances, in the absence of positive evidence. The result of learner judgments of abstract nouns, count or mass, indicates that abstract nouns could be conceptually treated as denoting entities that are intermediate between individuated objects and amorphous substances.

[10] This may reflect the relative greater emphasis on explicit grammar instruction in the English curriculum of schools in Shanghai, compared to the English curriculum of schools in Hong Kong. The Shanghai learners may have been more conscious of typical errors of count-mass usage than the Hong Kong learners because of pedagogical differences in the two cities.

4. Part II of the Study

4.1. Methods and procedure

Part II of the study investigated the extent to which Chinese ESL learners have mastered the singular count noun rule in English. The test items included the count nouns shown in (22).

(22) *computer, dictionary, mobile phone, credit card*
religion, sentence, dilemma, tragedy

These nouns, either preceded by an indefinite article or in bare noun form, appeared in subject, object, and prepositional object positions of the test sentences. The noun phrases in subject position were used either generically or referentially. The NPs in object position were used either referentially or were predicate nominals. The test design included 32 test sentences for subject position (8 nouns × 2 NP forms × 2 referentiality contexts), another 32 test sentences for object position, and 16 test sentences for the prepositional object position (8 nouns × 2 NP forms). Sample test sentences are given in (23-29), illustrating the relevant noun phrase forms, syntactic positions, and referentiality variations.

(23) Subject, concrete nouns, referential
  a. A computer stands on the top of the office desk, with the screen showing a beautiful painting.
  b. *Computer stands on the top of the office desk, with the screen showing a beautiful painting.
(24) Subject, concrete nouns, non-referential
  a. A computer is an electronic device that stores information in the form of ones and zeroes.
  b. *Computer is an electronic device that stores information in the form of ones and zeroes.
(25) Subject, abstract nouns, referential
  a. A sentence was given to the students, who were asked to draw a tree to represent its internal structure.
  b. *Sentence was given to the students, who were asked to draw a tree to represent its internal structure.
(26) Subject, abstract nouns, non-referential
  a. A sentence is a group of words that contain a verb and one or more nouns or noun phrases.
  b. *Sentence is a group of words that contain a verb and one or more nouns or noun phrases.
(27) Object, referential
  a. Yesterday, John bought a computer that is just as powerful as a desktop, with respect to speed and storage capacity.
  b. *Yesterday, John bought computer that is just as powerful as a desktop, with respect to speed and storage capacity.
(28) Object, non-referential
  a. The laptop that John bought yesterday is a computer that is just as powerful as a desktop, with respect to speed and storage capacity.
  b. *The laptop that John bought yesterday is computer that is just as powerful as a desktop, with respect to speed and storage capacity.
(29) Prepositional object
  a. Many complicated computations can be done in the fraction of a second with a computer.
  b. *Many complicated computations can be done in the fraction of a second with computer.

The task was administered to the same university subjects and native speakers who participated in Part I of the study. The senior high subjects for Part II of the study were not all identical to the previous ones, since some of the subjects in Part I failed the word translation task for Part II. As in Part I, the subjects were asked to give one of three judgments (grammatical, ungrammatical, not sure) to each test sentence. The mean numbers of acceptances were calculated for each of the subject groups, and according to syntactic positions and the referential properties of the nouns.

4.2. Findings

The findings are presented in Tables 4A, 4B, and 4C. First of all, we should make the general observation that senior high school learners did not reliably differentiate determined and bare singular count nouns, in subject, object or prepositional object positions. The mean acceptance rates for determined and bare nouns in all relevant syntactic positions ranged between 1.56 and 2.67. This clearly indicates that the singular count noun rule had not yet been acquired by the high school subjects.

Table 4A. Mean numbers of acceptances for sentences containing determined and bare nouns in subject position (maximum=4)*

		Det-N					Bare N				
		SH	U1	U3	HKU	Native	SH	U1	U3	HKU	Native
Concrete	Ref	2.67	3.27	3.40	3.24	3.33	2.00	0.47	0.47	1.59	0.00
	–Ref	2.33	3.27	3.33	2.94	3.83	2.44	2.20	1.73	2.71	0.17
Abstract	Ref	1.56	2.80	3.20	3.06	2.67	1.67	1.40	1.00	1.65	0.33
	–Ref	2.11	2.73	2.80	2.12	3.83	1.67	2.40	2.20	2.47	1.83

*Ref=Referential; –Ref=Non-referential

Table 4A gives the data for subject position. The results indicate that the university learners are sensitive to the singular count noun rule when the nouns are referential, but not when the nouns denote kinds. For referential count nouns in subject position, university learners accepted those with determiners significantly more than those without determiners, regardless of whether the count nouns were concrete or abstract (HKU: t=5.34, p=0.000 for concrete nouns; t=4.39 for abstract nouns; U1: t=10.019, p=0.000 for concrete nouns and t=3.862, p=0.002 for abstract nouns; U3: t=8.876, p=0.000 for concrete nouns, and t=6.205, p=0.000 for abstract nouns).

For non-referential count nouns in subject position, Table 4A shows that university learners generally accepted them regardless of whether the count nouns were determined or bare. This was true of both concrete and abstract nouns. Only the third-year Shanghai university students accepted determined nouns significantly more than they did bare nouns, and only with respect to concrete nouns (t=3.434, p=0.004). This may be seen as a L1 transfer effect, since as shown in (9), a kind-denoting subject NP in Chinese is well-formed if it is a bare NP, but ill-formed if it is a singular determined NP.

Table 4B. Mean numbers of acceptances for sentences containing determined and bare nouns in object position (maximum=4)

		Det-N					Bare N				
		SH	U1	U3	HKU	Native	SH	U1	U3	HKU	Native
Concrete	Ref	1.89	3.13	3.27	2.94	3.33	1.67	1.07	0.53	0.88	0.33
	–Ref	1.89	3.07	3.47	2.71	3.33	1.78	0.87	0.67	0.88	0.50
Abstract	Ref	1.56	1.87	2.27	2.82	3.17	1.78	1.13	0.80	0.88	0.50
	–Ref	2.67	3.40	3.27	2.88	3.67	1.89	1.20	0.47	1.18	1.33

Table 4B indicates that for referential count nouns in object position, university level learners accepted those with determiners significantly more than those without determiners, except for U1 learners in the case of abstract nouns. (HKU: t=6.31, p=0.000 for concrete nouns, and t=6.41, p=0.000 for abstract nouns; U1: t=6.254, p=0.000 for concrete nouns; U3: t=13.252, p=0.000 for concrete nouns, and t=4.036, p=0.001 for abstract nouns). For non-referential count nouns in object position, university students accepted those with determiners significantly more than those without determiners, regardless of the concrete and abstract distinction (HKU: t=4.73, p=0.000 for concrete nouns; t=4.26, p=0.001 for abstract nouns; U1: t= 8.401, p=0.000 for concrete nouns and t=6.736, p=0.000 for abstract nouns; U3: t=11.523, p=0.000 for concrete nouns and t=10.693, p=0.000 for abstract nouns). This means learners were aware that singular count nouns serving as objects of linking verbs should be preceded by a determiner.

The data for PP object position in Table 4C indicate that university learners accepted count nouns with determiners more than count nouns without determiners. This difference was significant for the U3 students, for both concrete nouns (t= 6.468, p=.000) and abstract nouns (t=4.459, p=0.001). For Hong Kong university learners, this difference was significant only if the count noun is concrete (HK: t=2.89, $p<0.05$), and not if the count noun is abstract. This difference was not significant for the first-year university students.

Table 4C. Mean numbers of acceptances for sentences containing determined and bare nouns in preposition object position (maximum=4)

	Det-N					Bare N				
	SH	U1	U3	HKU	Native	SH	U1	U3	HKU	Native
Concrete	2.44	2.80	3.40	3.24	3.33	1.78	2.00	1.07	2.29	0.83
Abstract	1.89	2.13	2.93	2.59	3.17	1.22	1.47	1.27	2.12	1.17

The overall data from the three tables suggest that grasp of the singular count noun rule developed first for the object position. As for the subject position, the rule was mastered earlier for referential contexts than non-referential contexts. Generally, awareness of the rule was keener for concrete nouns than for abstract nouns.

5. Part III of the Study

In Part III of the study, a forced choice task was used in which subjects had to choose between a determined noun and a bare noun, given a context which is appropriate for one of the uses. For the test items chosen, the count use differed from the mass use in a general way: the count use denotes an individuated object carrying or embodying the attribute concerned; the mass use denotes the attribute itself. The count context consisted of either a referential subject or object position. The mass context is the subject of a generic sentence, or the object of a preposition, or the complement of a copula. The count and mass nouns used are given in (30). Sample test sentences are shown in (31-32).

(30) *Time, thought, truth, action, theory, shape*

(31) Count context

a. _____ (Thought/A thought) came to the student's mind as he listened to the professor lecturing in the room.

b. Fifty years ago, two biologists invented _____ (theory/a theory) that shook the rest of the world, discovering the structure of the human gene.

c. When asked to draw something, the child drew _____ (shape/a shape) that looked like a triangle**,** using a blue marker.

(32) Mass context

a. Whether _____ (thought/a thought) depends on language seems to be an issue that has interested many philosophers, linguists and psychologists.

b. Which is more important in scientific investigations: _____ (theory/a theory) or data? This is a question which has puzzled many beginners in the research community.

c. When designing a piece of sculpture, one of the factors which an artist must pay attention to is _____ (shape/a shape).

The figures in Table 5 reveal that university students were able to use the indefinite determiner in referential contexts, in which the nominal denotes an individuated object, and use the bare noun in a generic or oblique context, in which the nominal denotes an attribute. The senior high school students did not seem to have grasped this distinction as well as the university students.

Table 5. Mean numbers of correct choices of determined and bare nouns for count and mass contexts (maximum = 6)

	Determined nouns for count contexts	Bare nouns for mass contexts
SH	3.89	5.56
U1	5.07	5.13
U3	4.87	5.67
HKU	5.18	5.00
Native	5.33	5.67

6. Conclusions

In this paper, we have investigated Chinese ESL learners' sensitivity to the distributional environments of English count-mass nouns, their knowledge of the singular count noun rule, as well as their understanding of some semantic correlates of the count-mass distinction. Advanced Chinese-speaking learners of English are sensitive to the diagnostic count-selective and mass-selective contexts in English. Learners do not understand the English count-mass distinction solely on a word by word basis. In the absence of positive evidence, they rely on knowledge of ontological properties of noun referents to some extent. An L1 transfer effect can be observed in learners' understanding of the singular count noun rule. Advanced learners are sensitive to the singular count noun rule for noun phrases in object position and for subject NPs when these are referential, but not when they denote kinds. Learners' grasp of the singular count noun rule appears earlier for concrete nouns than for abstract nouns. Learners are aware of certain systematic semantic differences between count and mass uses of the same noun.

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