

## General Number and the Semantics and Pragmatics of Indefinite Bare Nouns in Mandarin Chinese

**1. Introduction.** Recent discussions of the semantics of number in Mandarin Chinese have focused on the absence of a mass/count distinction and the role of the numeral classifier in making nouns ‘countable’ (Krifka 1995, Chierchia 1998a,b). This paper discusses a related aspect of nominal semantics in Mandarin, namely the semantic and pragmatic properties of indefinite bare nouns compared to those of full DPs. By bare nouns we mean nouns which lack any determiners or classifiers. More specifically, we focus on bare nouns with an indefinite interpretation. (Bare nouns in Mandarin can also have generic and definite interpretations, depending on various factors that do not concern us here; cf. Cheng and Sybesma 1999, Yang 2001). Our starting point is the observation that in Mandarin (as in many other languages) indefinite bare nouns are neutral (or unspecified) for number:

- (1) Zuotian wo mai le shu.  
yesterday I buy ASP book ‘Yesterday, I bought one or more books.’

The bare noun *shu* ‘book’ in (1) is neither singular nor plural. Following Corbett (2000), we will say that it has GENERAL NUMBER. By contrast, in English nouns are always specified for number; that is, every occurrence of a noun is either singular or plural (except maybe in compounds such as *bookstore*). Although Mandarin is a language without inflectional number morphology on nouns, it is not the case that all noun phrases in the language are semantically numberless. In contrast to the bare noun in (1), the full DP (*yi ben shu* ‘(one) classifier book’ in (2) is semantically singular, and the full DP *yixie shu* ‘some books’ in (3) is semantically plural:

- (2) Zuotian wo mai le (yi) ben shu.  
yesterday I buy ASP one CL book. ‘Yesterday, I bought a/one book.’
- (3) Zuotian, wo mai le yixie shu.  
yesterday, I buy ASP some book. ‘Yesterday, I bought some books.’

One of the goals of this paper is to explicate the notion of general number. A second goal is to explore the semantic and pragmatic differences between indefinite bare nouns and indefinite full DPs. We will argue that bare nouns do not only differ from full DPs in the fact that they have general number, but also with respect to discourse anaphora, scalar implicatures, and scope. Our third goal is to give a theoretical account of these differences making use of Chung and Ladusaw’s (ms., 2001) theory of restriction and saturation as two different “modes of combination”.

**2. Bare nouns are not ambiguous in number.** The fact that a bare noun has general number does not mean that (1) is ambiguous between a singular reading ‘Yesterday I bought a book’ and a plural reading ‘Yesterday I bought books.’ Rather the sentence has a single meaning which in English can only be paraphrased by means of a more cumbersome circumlocution such as ‘Yesterday I bought one or more books.’ Evidence for this claim comes from traditional ambiguity tests. Mandarin has a construction that is the functional equivalent of VP deletion in English, which is illustrated in (4).

- (4) Wo you tie fanwan. Yuehan ye you.  
I have iron bowl. John also have  
‘I have (an) iron bowl(s). So does John.’ or ‘I have (a) steady job(s). So does John.’

This construction can be used as a test for ambiguity in the same way as VP deletion in English (Zwicky and Sadock 1975, Cruse 1986). The noun *tie fanwan* in (4) is ambiguous, meaning ‘iron bowl’ or ‘steady job’. When the object is elided under identity in the second conjunct, the deleted phrase and its antecedent needs to have the same sense as its antecedent. As a result, the two-sentence discourse as a whole is only two-ways ambiguous, not four-ways. Applying this test for

ambiguity to bare nouns, we see that they are number neutral, rather than ambiguous. (5), for instance, is true if the speaker and John each bought one book, or if they each bought more than one book, but also if the speaker bought one book and John bought more than one, or vice versa.

- (5) Zuotian wo mai le shu. Yuehan ye mai le.  
 Yesterday I buy ASP book. John also buy ASP.  
 ‘Yesterday I bought one or more books. So did John.’

When we compare (1) to its English counterpart (6), an important question arises.

- (6) Yesterday I bought a book.

At least since Grice, it has generally been assumed that (6) is actually true if the speaker bought more than one book. The fact that, without further information, the hearer may conclude from (6) that the speaker did not buy more than one book is a conversational implicature rather than a logical entailment. But if (6) is true iff the speaker bought one or more books, then what exactly is the difference between (6) in which the noun is singular and its Mandarin counterpart (1) in which the noun has general number? We argue that although (1) and (6) have the same truth conditions, they clearly differ in meaning, as will become clear when we look at discourse anaphora and implicature.

**3. Discourse anaphora.** In English, a singular indefinite can only be referred back to by a singular pronoun, whereas a plural indefinite requires a plural pronoun:

- (7) a. Yesterday I bought a book. I brought it/\*them home with me.  
 b. Yesterday I bought (some) books. I brought them/\*it home with me.

In Mandarin, an indefinite bare noun can be referred back to with either a singular or a plural overt pronoun, or with a null pronoun (indicated as  $\emptyset$ ) which itself is unspecified for number:

- (8) a. Zuotian wo yudao le tongshi. Wo qing ta/tamen chifan le.  
 Yesterday I meet ASP colleague. I invite {him,her}/them eat ASP  
 ‘Yesterday, I met one or more colleagues. I invited him/her/them to dinner.’  
 b. Zuotian wo mai le shu. Wo ba ta/tamen dai hui jia le.  
 yesterday I buy ASP book. I BA it/them bring back home ASP  
 ‘Yesterday, I bought one or more books. I brought it/them home.’  
 c. Zuotian wo mai le shu. Wo dai  $\emptyset$  hui jia le.  
 yesterday I buy ASP book. I bring back home ASP  
 ‘Yesterday, I bought one or more books. I brought it/them home.’

This contrasts with singular indefinite DPs formed with *yi* ‘one’ plus a classifier or just a classifier. These can only be referred back to with the singular pronoun *ta* ‘it’ or with a null pronoun:

- (9) a. Zuotian wo yudao le (yi) ge tongshi. Wo qing ta/\*tamen chifan le.  
 Yesterday I meet ASP one CL colleague. I invite {him,her}/\*them eat ASP  
 ‘Yesterday, I met one colleague. I invited him/her to dinner.’  
 b. Zuotian wo mai le (yi) ben shu. Wo ba ta/\*tamen dai hui jia le.  
 yesterday I buy ASP one CL book. I BA it/\*them bring back home ASP  
 ‘Yesterday, I bought one book. I brought it home.’  
 c. Zuotian wo mai le (yi) ben shu. Wo dai  $\emptyset$  hui jia le.  
 yesterday I buy ASP one CL book. I bring back home ASP  
 ‘Yesterday, I bought one book. I brought it home.’

Conversely, DPs with *yixie* ‘some’ are semantically plural and require a zero or plural pronoun:

- (10) a. Zuotian, wo yudao le yixie tongshi. Wo qing \*ta/tamen chifan le.  
 yesterday, I meet ASP some colleague. I invite {\*him,\*her}/them eat ASP  
 ‘Yesterday, I met some colleagues. I invited them to dinner.’

- b. Zuotian, wo mai le yixie shu. Wo ba \*ta/tamen dai hui jia le  
yesterday, I buy ASP some book. I BA \*it/them bring back home ASP.  
'Yesterday, I bought some books. I brought them home.'
- c. Zuotian, wo mai le yixie shu. Wo dai Ø hui jia le  
yesterday, I buy ASP some book. I bring back home ASP.  
'Yesterday, I bought some books. I brought them home.'

We see that although sentences containing an indefinite with general number may have the same truth conditions (or “static” semantics; Groenendijk and Stokhof 1990) as those with singular and plural indefinites, they differ in the effect they have on the discourse context (their “dynamic” semantics). Whereas singular indefinites introduce a singular discourse referent and plural indefinites introduce a plural discourse referent, indefinites with general number introduce a discourse referent that is itself number neutral.

**4. Conversational implicature.** Another non-truthconditional difference between indefinite bare nouns and singular indefinites is in conversational implicature. Singular indefinites trigger the scalar implicature that not more than one entity is involved, but this implicature is absent with bare nouns. Therefore, singular indefinites are compatible with expressions marking the cancellation of a scalar implicature such as *qishi* ‘in fact’ (cf. Horn 1972, 1989), but bare nouns are not:

- (11) a. Zuotian wo mai le (yi)ben shu. Qishi, wo mai le wuben.  
yesterday I buy Asp one-CL book. In fact, I buy Asp five-CL  
'Yesterday I bought a book. In fact, I bought five'
- b. # Zuotian wo mai le shu. Qishi, wo mai le wuben.  
yesterday I buy ASP book. In fact, I buy ASP five-CL  
'Yesterday I bought one or more books. In fact, I bought five'

Interestingly, Mandarin has another expression *zhunque de shuo* ‘to be exact’ which can be used to further specify the number of entities involved. This expression shows the opposite pattern from *qishi*: it is fine with bare nouns but is much less felicitous with singular or plural indefinites:

- (12) a. # Zuotian wo mai le (yi)ben shu. Zhunque de shuo, wo mai le wu ben  
yesterday I buy ASP one CL book exactly MOD say I buy ASP five CL  
'Yesterday, I bought bought a book. To be exact, I bought five.'
- b. Zuotian wo mai le shu. Zhunque de shuo, wo mai le wu ben  
yesterday I buy ASP book exactly MOD say I buy ASP five CL  
'Yesterday, I bought bought one or more books. To be exact, I bought five.'

Further evidence comes from the fact that metalinguistic negation (Horn 1989) of the scalar implicature ‘not more than one’ is possible with singular indefinites but not with bare nouns (and as (14) shows the same is true of English bare plurals):

- (13) a. Zuotian wo bu (zhi) mai le yiben shu. Wo mai le wuben.  
yesterday I not (just) buy Asp one-CL book. I buy Asp five-CL  
'Yesterday, I didn't just buy one book. I bought five.'
- b. # Zuotian wo bu (zhi) mai le shu. Wo mai le wuben.  
yesterday I not (just) buy ASP book. I buy ASP five-CL.  
'Yesterday, I didn't just buy one or more books. I bought five.'
- (14) a. I didn't buy ONE/A book – I bought five.  
b. # I didn't buy books – I bought five.

**5. Scope.** Carlson (1977) has demonstrated that English bare plurals always seem to take the narrowest possible scope, unlike indefinite full DPs, which may take either wide or narrow scope:

- (15) a. Minnie wishes to talk with a young psychiatrist. (wide or narrow scope)  
 b. Minnie wishes to talk with young psychiatrists. (only narrow scope)

Sometimes a bare plural can even have narrower scope than an indefinite singular possibly can:

- (16) a. # A dog was everywhere.  
 b. Dogs were everywhere.

These observations carry over to bare nouns in Mandarin, as do Carlson's other tests (Yang 2001):

- (17) a. Mini xiang gen yige nianqing de xinlixuejia tantan. (wide or narrow scope)  
 Minnie wish with one-CL young MOD psychiatrist talk  
 'Minnie wishes to talk with a young psychiatrist'  
 b. Mini xiang gen nianqing de xinlixuejia tantan. (only narrow scope)  
 Minnie wish with young MOD psychiatrist talk  
 'Minnie wishes to talk with young psychiatrists'
- (18) a. # Yizhi gou suichugejian.  
 one-CL dog everywhere 'A dog was everywhere.'  
 b. Gou suichugejian.  
 dog everywhere 'Dogs were everywhere'

**6. Theoretical implications.** There is a fundamental difference between Mandarin and English with respect to the denotation of morphologically unmarked nouns. In English, a singular noun denotes a set of atomic individuals, and the corresponding plural noun denotes the set of all non-atomic sums that can be formed from those individuals (Link 1983, and much subsequent work). In Mandarin, however, nouns by themselves are unspecified for number. In formal semantic terms this means that a noun in Mandarin denotes a set of atomic and non-atomic individuals that is closed under sum-formation (Chierchia 1998a,b). It is the functional elements of the DP, in particular the classifier and determiner, which pick out only atomic (singular) or only non-atomic (plural) members of the semi-lattice denoted by the noun. Thus whereas in English number is a property of both the noun and the DP, in Mandarin number is only a property of the DP.

This difference between Mandarin and English in the semantics of nouns ties in with assumptions we make about the syntactic status of bare nouns vis a vis full DPs. We assume that bare nouns are NPs; that is, they are maximal projections of the lexical head N without any functional projections "on top". (It should be noted that bare nouns can be modified by non-functional material such as adjectives. This means that they must be phrasal; it would therefore be more accurate to call them "bare NPs", but we will stick with the more entrenched and less theoretically loaded term "bare nouns".) In Mandarin then there are no number distinctions at the NP level; NPs have general number and their denotation is closed under sum formation.

To implement our analysis we make use of the theoretical framework recently proposed by Chung and Ladusaw (ms., 2001), henceforth Ch&L. (It should be noted however that the main points of our analysis could probably equally well be implemented in a neo-Carlsonian framework in which bare nouns refer to kinds (Carlson 1977, Chierchia 1998a,b).) Ch&L argue that there are two "modes of composition" for a verb and a nominal: saturation and restriction. (We use the term "nominal" for the verb's syntactic argument to remain neutral with respect to its syntactic category, DP or NP.) The nominal saturates a predicate if it fills one of its argument positions, thereby reducing the arity of the predicate by one. This is the standard mode of composition traditionally assumed. Ch&L propose there is another option: the argument may restrict the verb's argument position without saturating it. The still unsaturated argument position is subsequently closed off by means of existential closure. (Ch&L argue that in some languages the argument position may be saturated by a second nominal — an option which we assume is not available in Mandarin.)

We propose that the only mode of composition available to indefinite bare nouns (i.e. NPs) in Mandarin is restriction. All the NP contributes to the semantic composition is a predicate. It does not have any quantificational force of its own. The existential interpretation comes about through the operation of existential closure (presumably applying at the VP level). One consequence of this is that bare nouns cannot take wide scope over any other element in the sentence. Indefinite full DPs, on the other hand, combine with the verb through saturation, and they are able to take wide scope by the usual means, e.g. choice functions or quantifier raising (we do not take a stand here on the choice between these two options.) This difference accounts for the scope facts in section 5.

The absence of scalar implicatures with bare nouns also naturally falls out from our analysis. Scalar implicatures crucially depend on the existence of a Horn scale (Horn 1972, 1989), i.e. a series of lexical expressions ranked by semantic “strength” or informativeness. The speaker’s choice of a given expression on the scale rather than a stronger expression implicates that the stronger expression does not apply, by the Maxim of Quantity. For the scalar implicature generated by indefinite DPs the Horn scale consists of numerals. We assume that the English indefinite article *a(n)* is just the unstressed version of the numeral *one*, and that in Mandarin the numeral *yi* ‘one’ may be deleted when unstressed. Both English DPs of the form ‘*a(n)* N’ and Mandarin DPs of the form ‘(*yi*) CL N’ therefore generate the implicature ‘not more than one N’. By contrast, bare nouns lack a determiner altogether, so there is no relevant Horn scale of expressions indicating quantity and no scalar implicature can arise. The operation of existential closure which applies to bare nouns is inherent in the compositional interpretation process and does not depend on the presence or absence of a particular lexical item. Because the speaker in that case does not choose between lexical items of different semantic strength on a Horn scale, there can be no conversational implicature.

## References

- Carlson, G. N. 1977a. *Reference to Kinds in English*. Doctoral dissertation, University of Massachusetts, Amherst.
- Carlson, G. N. 1977b. A Unified Analysis of the English Bare Plural. *Linguistics and Philosophy* 1: 413-457.
- Cheng, L. and R. Sybesma 1999. Bare and Not-So-Bare Nouns and the Structure of NP. *Linguistic Inquiry* 30: 509-542.
- Chierchia, G. 1998a. Plurality of Mass Nouns and the Notion of “Semantic Parameter.” In *Events and Grammar*, ed. S. Rothstein, 53-103. Dordrecht: Kluwer.
- Chierchia, Gennaro. 1998b. Reference to Kinds across Languages. *Natural Language Semantics* 6: 339-405.
- Chung, S. and W. Ladusaw. 2001. *Restriction and Saturation*. Ms., UC Santa Cruz.
- Corbett, G. G. 2000. *Number*. Cambridge: Cambridge University Press.
- Cruse, D.A. 1986. *Lexical Semantics*. Cambridge: Cambridge University Press.
- Groenendijk, J., and M. Stokhof. 1990. Dynamic Montague Grammar. In *Papers from the Second Symposium on Logic and Language*, ed. L. Kalman and L. Polos. Budapest: Akadémiai Kaidó.
- Horn, L. 1972. *On the Semantic Properties of Logical Operators in English*. Ph.D. thesis, UCLA.
- Horn, L. 1989. *A Natural History of Negation*. Chicago: Chicago University Press.
- Krifka, M. 1995. Common Nouns: A Contrastive Analysis of Chinese and English. In *The Generic Book*, ed. G.N. Carlson and F.J. Pelletier, 398-411. Chicago: University of Chicago Press.
- Link, G. 1983. The Logical Analysis of Plurals and Mass Terms. In *Meaning, Use, and Interpretation of Language*, ed. R. Bauerle, C. Schwarze, and A. von Stechow, 302-323. Berlin: de Gruyter.
- Yang, R. 2001. *Common Nouns, Classifiers, and Quantification in Chinese*. Ph.D. diss. Rutgers.
- Zwicky, A., and J. Sadock. 1975. Ambiguity Tests and How to Fail Them. In *Syntax and Semantics*, vol. 4, ed. J. Kimball, 1-36. New York: Academic Press.