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Nominal Reference in two Classifier Languages*

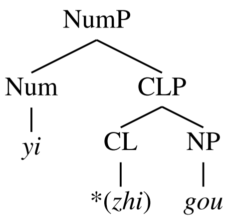
Tue Trinh
Massachusetts Institute of Technology
tuetrinh@mit.edu

Abstract. In this paper, we first present observations that have been made concerning the distribution and interpretation of nominals in Mandarin Chinese and propose an account for them. We will then contrast Mandarin Chinese with Vietnamese, and show that differences with respect to the syntax and semantics of noun phrases between these two languages can be reduced to the fact that they differ minimally in lexical resource. Implications of the analysis for a theory of semantic variation are also discussed.

1 Mandarin Chinese

Mandarin Chinese is a "classifier" language of the East Asian variety. Thus, count nouns in this language cannot combine directly with numerals without the mediation of grammatical morphemes: the classifiers (cf. Ren 1968; Cheng & Sybesma 1999, 2005; Lee 1986; Li & Thompson 1989; Shyu 1995; Tang 1990; Tsai 1994, 2001; Xu 1996). For example, 'one dog' has to be expressed as *yi zhi gou*, where *yi* is the numeral 'one' and *gou* is the word for 'dog'. The word *zhi* is the classifier which enables *gou* to combine with *yi*, so to speak. I am going to assume, following several works, that the numeral c-commands both the classifier and the noun, and that the classifier c-commands the noun, as in (1).

(1)



It turns out that each constituent of NumP can appear independently in sentences. For example, the bare noun *gou*, the classifier phrase *zhi gou* and the numeral phrase *yi zhi gou* can all be arguments of verbs. However, these categories differ both in distribution and interpretation. This fact is captured suc-

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cinctly in a quote from Cheng & Sybesma (2005: 263): "In Mandarin, bare NPs can be interpreted as definite, indefinite or generic. Num-CL-NPs [numeral phrases] and CL-NPs [classifier phrases] are invariably indefinite [...] All indefinites occur in postverbal position only."[1] Cheng and Sybesma's observation is replicated by several other researchers, and will be illustrated with examples in the following subsections. Some facts which pertain to the use of nominals as predicatives (i.e. complements of the copula verb) will also be presented. These, to the best of my knowledge, are novel.

1.1 Interpretation of NP

The sentences in (2) exemplify the interpretation of NP in subject positions: (2a) shows that bare nouns (NPs) can be definite, singular or plural, and (2b-c) evidence the generic reading of NP, both as arguments of individual-level predicates such as 'to be intelligent,' and kind-predicates such as 'to be extinct.'

(2) a. Gou yao guo malu (Cheng & Sybesma 1999: 510)
dog want cross road
'The dog(s) / *a dog / *dogs want(s) to cross the street'

b. Gou hen jiling (Yang 2001: 20)
dog very smart
'The dog(s) / dogs is/are intelligent'

c. Gou juezhong le (Rullmann & You 2006: 176)
dog extinct ASP
'Dogs are extinct'

The sentences in (3) are examples of NP in post-verbal position. We can see that NP in object positions has all the readings that NP in subject positions has, plus the indefinite reading, which is number-neutral. Thus, *kanjian gou* (see dog) can mean 'see the dog,' 'see the dogs,' 'see a dog,' or 'see (some) dogs.'

(3) a. Wo kanjian gou le (Rullmann & You 2006: 176)
I see dog ASP
'I saw the dog(s) / a dog / dogs'

[1] As can be seen from their examples, Cheng and Sybesma intended the term "generic" to mean both 'kind-refering' (or 'D-generic'), as in *dogs will be extinct*, and 'characterizing' (or 'I-generic'), as in *dogs like meat* (Krifka 1987; Krifka, Pelletier, Carlson, ter Meulen, Chierchia & Link 1995). We will use "generic" in the same way here. Note, also, that we exclude from the discussion the so-called "quantity interpretation" of numeral phrases ('five children cannot finish ten bowls of rice'), under which these phrases can occupy subject positions (Li 1998). If the analysis proposed below is correct, numeral phrases in this reading must have more structure than that represented in (1). I leave this topic to future research.

b. Wo xihuan gou (Cheng & Sybesma 1999: 510)
I like dog
'I like dogs'

c. Turing faming dyannao (Leo Chen personal communication)
Turing invent computer
'Turing invented the computer'

(4a) and (4b) illustrate the use of NP as predicatives (Leo Chen, T.-C. James Huang, Zhang Min personal communication). Again, we witness number-neutrality: the bare noun *gou* can be predicated of a singular subject like Fido, or a plural one like Fido and Pluto.

(4) a. Fido shi gou
Fido be dog
'Fido is a dog'

b. Fido he Pluto shi gou
Fido and Pluto be dog
'Fido and Pluto are dogs'

1.2 Interpretation of CLP

The next category, CLP [classifier phrase], can only appear in post-verbal positions, as evidenced by the contrast in (5). In addition, it can only be interpreted as a singular indefinite: (5a) has the implicature that the speaker bought one but not two books.

(5) a. Zuotian wo mai le ben shu (Rullmann & You 2006: 175)
yesterday I buy ASP CL *book*
'I bought a book yesterday'

b. *Zhi gou yao guo malu (Cheng & Sybesma 2005: 262)
CL *dog want cross road*

Just like NP, CLP can function as predicatives. However, it differs from NP in that it requires a singular subject: *zhi gou* can be predicated of a singular individual such as John, but not of a sum individual such as Fido and Pluto (Leo Chen, T.-C. James Huang, Zhang Min, personal communication).

(6) a. John shi zhi gou
John be CL *dog*
'John is a dog'

b. *Fido he Pluto shi zhi gou
Fido and Pluto be CL *dog*
('Fido and Pluto are dogs')

1.3 Interpretation of NumP

The numeral phrase has basically the same syntax and semantics as the classifier phrase: it can only appear in post-verbal positions, and interpreted as an indefinite, as (7) shows.

(7) a. Wo kan le san ben shu (Yang 2001: :133)
I read ASP *three* CL *book*
'I read three books'

b. *Sange xuesheng zai xuexiao shoushang le (Li 1998: :694)
three student at school hurt ASP
('Three students were hurt at school')

c. *yi zhi gou xihuan chi rou (Cheng & Sybesma 2005: :262)
one CL *dog like eat meat*
('A dog (generally) likes to eat meat')

NumP can also appear post-copula, in which case the subject must match the predicative in number. (8) shows that the phrase *liang zhi gou* (two CL dog) can be predicated of Fido and Pluto, but not of Fido alone.

(8) a. Fido he Pluto shi liang zhi gou
Fido and Pluto be two CL *dog*
'Fido and Pluto are two dogs'

b. *Fido shi liang zhi gou
Fido be two CL *dog*

1.4 Summary

The facts just described are summarized in (9). The generalization is that all nominal categories can be indefinites or predicatives, but only bare nouns can be generic or definite. Furthermore, Mandarin Chinese does not allow indefinite subjects.

(9) Generalizations about Chinese NP, CLP and NumP
a. Indefinite and predicative: all categories
b. Definite and generic: NP
c. Subjects cannot be indefinite

1.5 The Universe of Discourse

We turn now to the analysis. The starting point will be a domain of quantification U which contains both singularities and pluralities ($U = \{a, b, c, ..., a + b, b + c, a + b + c, ...\}$), as assumed in many previous works (Chierchia 1998; Landman 1989; Link 1983; Schwarzschild 1996). The sum operator + which maps singular to plural individuals, and the 'part of' relation $\leq$ which partially orders U, are understood in the usual way (i.e. $x+x=x, x+y=y+x, (x+y)+z=x+(y+z), x \leq y \leftrightarrow x+y=y$).

It would help to define two notions which will feature in the analysis to be developed below. First, given any subset P of U, an atom of P, or a P-atom, will be a P-individual which has no proper part which is itself a P-individual.

(10) Atoms of P
$x \in AT(P)$ iff $x \in P \wedge \forall y((y \in P \wedge y \leq x) \rightarrow (y=x))$
$\Rightarrow$ 'x is a P atom iff x is P and has no proper part which is P'

Second, the maximal element of P will be that individual which has every element of P as part. This definition employs the notion 'supremum of P', which is defined in (12).

(11) Maximal element of P
$MAX(P) = SUP(P)$ if $SUP(P) \in P$, undefined otherwise
$\Rightarrow$ 'The maximal element of P is that individual in P which has every individual in P as part'

(12) Supremum of P
$x \in P \rightarrow x \leq SUP(P)$ and $\forall y(y \in P \rightarrow y \leq z) \rightarrow SUP(P) \leq z$
$\Rightarrow$ 'The supremum of P is the smallest individual that has every element of P as part'

To illustrate, suppose $P = \{a, b, a+b\}$. Then, $MAX(P) = SUP(P) = a+b$. If $P = \{a\}$, then $MAX(P) = SUP(P) = a$. If $P = \{a, b\}$, $SUP(P) = a+b$ but $MAX(P)$ is undefined. A consequence of (11) is that if $P = AT(P)$, then $MAX(P)$ is defined only if P is a singleton.[2]

Last but not least, I assume that U contains a set G of kinds. Following Chierchia (1998) and Chierchia & Turner (1988), I assume that kinds are atoms of the universe, i.e. $G \subseteq AT(U)$. At the same time, they are intensional entities, or more precisely, they are individual concepts, i.e. $G \subseteq U^W$. The idea is that each kind k is an individual correlate of a property P: it maps each possible world w to the sum individual which encompasses all individuals which are P in w. This will be made more precise below.

[2] To see this, let $P = AT(P)$ and $MAX(P)$ be defined. It follows from the definition of MAX (11) that there is some x such that (i) $MAX(P) = x$, (ii) $x = SUP(P)$, and (iii) $x \in P$. Given that $P = AT(P)$, it follows that (iv) $x \in AT(P)$. Now suppose P is not a singleton. Then there is some y such that (v) $y \in P$ and (vi) $y \neq x$. Given the definition of SUP (12), it follows from (ii) and (v) that (vii) $y \leq x$. Given the definition of AT (10), it follows from (iv), (v) and (vii) that $y = x$. But (vii) contradicts (vi). Thus, P is a singleton. QED.

1.6 Semantic Interpretation

1.6.1 Predicatives

I turn now to the semantics of nominals in Mandarin Chinese. Following Chierchia (1998), I assume that nouns in classifier languages are "cumulative" predicates, and that the function of *CL* is to make predicates "atomic." The definitions of "atomic" and "cumulative" are given in (13). Basically, X is an atomic predicate if the extension of X necessarily consists of atoms of X, and X is a cumulative predicate iff the extension of X is necessarily a set closed under the sum operation (cf. Krifka 1989; Quine 1960).

(13) X is an atomic predicate iff $[\![X]\!]_w = AT([\![X]\!]_w)$
X is a cumulative predicate iff $[\![X]\!]_w = +AT([\![X]\!]_w)$[3]

The classifier *CL* is defined as in (14). It denotes the atomizing function AT, which applies to a set and yields the atoms of this set.

(14) $[\![CL]\!]_w \subseteq D_{<e,t>} \times D_{<e,t>}$
$[\![CL\, X]\!]_w = AT([\![X]\!]_w)$

From the definition of *CL* in (14), we can derive the theorem that classifier phrases are atomic predicates.

(15) Theorem 1
$[CL\, X]$ is an atomic predicate[4]

We can now explain the predicative use of NP and CLP. Since NP is cumulative, its extension includes both singularities and pluralities, which means it can be true of both singular and plural individuals, as shown in (16a-b). Since CLP is atomic, it can be true of only singular individual, as shown in (16c-d). Assuming that analytically false sentences are ungrammatical (cf. Von Fintel 1993; Gajewski 2003; Abrusán 2007) we explain the contrast seen in (6).

(16) a. $[\![\text{Fido shi gou}]\!]_w = 1$ iff $[\![\text{Fido}]\!]_w \in \{a, b, c, a+b, b+c, a+c, a+$

[3] $+P$ is the closure of P under $+$, i.e. $+P = \{SUP(Q) : Q \subseteq P\}$. For example, if $P = \{a, b, c\}$ then $+P = \{a, b, c, a+b, b+c, a+c, a+b+c\}$. In this and all subsequent definitions, free variables are to be understood as universally quantified over.

[4] We prove Theorem 1 by proving that $[\![CL\, X]\!]_w = AT([\![CL\, X]\!]_w)$. Given the definition of CL (14), this means proving that $AT([\![X]\!]_w) = AT(AT([\![X]\!]_w))$, or more generally that $AT(P) = AT(AT(P))$, i.e. that $x \in AT(P)$ iff $x \in AT(AT(P))$. Now it follows from the definition of AT (10) that if $x \in AT(AT(P))$ then $x \in AT(P)$. The same definition implies that we can prove the other direction by showing that if $x \in AT(P)$ then $((y \in AT(P) \wedge y \leq x) \rightarrow (y = x))$, i.e. that if (i) $x \in AT(P)$, (ii) $y \in AT(P)$ and (iii) $y \leq x$, then $y = x$. Given, again, the definition of AT (10), it follows from (ii) that (iv) $y \in P$, and from (i), (iv) and (iii) that $y = x$. QED.

$b+c\}$

b. $[\![\text{Fido he Pluto shi gou}]\!]_w = 1$ iff $[\![\text{Fido}]\!]_w + [\![\text{Pluto}]\!]_w \in \{a, b, c, a+b, b+c, a+c, a+b+c\}$

c. i $[\![\text{Fido shi zhi gou}]\!]_w = 1$ iff $[\![\text{Fido}]\!]_w \in \{a, b, c\}$

d. $[\![\text{Fido he Pluto shi zhi gou}]\!]_w = 1$ iff $[\![\text{Fido}]\!]_w + [\![\text{Pluto}]\!]_w \in \{a, b, c\}$, i.e. iff $\perp$

As for the numeral phrase NumP, we follow Ionin & Matushansky (2006) and assume that only individuals of the same cardinality can be counted. One way to flesh out this idea is to require that the predicate P which is the complement of a numeral necessarily contain only individuals of the same number of P-parts. This is written into the definition of numerals, as exemplified by the definition of *liang* in (17).[5]

(17) $[\![\text{liang}]\!]_w \subseteq D_{<e,t>} \times D_{<e,t>}$
$[\![\text{liang } X]\!]_w$ is defined iff $\exists n(\forall w'(\forall u(u \in [\![X]\!]_{w'} \rightarrow |u|^{[\![X]\!]_{w'}} = n)))$
If defined, $[\![\text{liang } X]\!]_w = \lambda x(x \in +[\![X]\!]_w \wedge |x|^{[\![X]\!]_w} = 2)$

From (17) we can derive the theorem that the complement of *liang* must be an atomic predicate, and also that the numeral phrase itself is an atomic predicate.

(18) Theorem 2 - $[\![\text{liang } X]\!]_w$ is defined iff X is an atomic predicate[6]

(19) Theorem 3 - $[\![\text{liang } X]\!]_w$ is an atomic predicate[7]

The predicative use of NumP follows: as *liang zhi gou* (two CL dog) denotes a set of pluralities of dogs, or more precisely a set of duos of dogs, only a plural individual like Fido and Pluto can be in that set. A singular individual like Fido cannot be in the extension of *liang zhi gou*. Again, assuming that analytically false sentences are ungrammatical, we explain the contrast seen in (8).

(20) a. $[\![\text{Fido he Pluto shi liang zhi gou}]\!]_w = 1$ iff $[\![\text{Fido}]\!]_w + [\![\text{Pluto}]\!]_w \in \{a+b, b+c, a+c\}$

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[5] Notationally, $|x|^P$ denotes the number of P-parts of x, i.e. $|x|^P = \#\{y | y \in P \wedge y \leq x\}$.

[6] Theorem 2 is proved as follows. Suppose X is not atomic. From the definition of "atomic" (13), it follows that for some w', $AT([\![X]\!]_{w'}) \neq [\![X]\!]_{w'}$, hence $AT([\![X]\!]_{w'}) \subset [\![X]\!]_{w'}$. This means that there exists some $u \in [\![X]\!]_{w'}$ such that $u \notin AT([\![X]\!]_{w'})$, which means there is some $v \in [\![X]\!]_{w'}$ such that $v < u$, i.e. such that $|v|^{[\![X]\!]_{w'}} \neq |u|^{[\![X]\!]_{w'}}$. It follows from (17) that $[\![\text{liang } X]\!]_w$ is not defined. Now suppose X is atomic. Then for all w', $[\![X]\!]_{w'} = AT([\![X]\!]_{w'})$, hence for all w', $|u|^{[\![X]\!]_{w'}} = 1$ for all $u \in [\![X]\!]_{w'}$, which means that $[\![\text{liang } X]\!]_w$ is defined. QED.

[7] Here is the proof. Suppose $[\![\text{liang}X]\!]_w$ is not an atomic predicate. Then for some w', $[\![\text{liang}X]\!]_{w'}$ contains v and u such that $v \neq u$ and $v + u = u$. By assumption, $|v|^{[\![X]\!]_{w'}} = |u|^{[\![X]\!]_{w'}} = 2$. As $v + u = u$, $|v+u|^{[\![X]\!]_{w'}} = |u|^{[\![X]\!]_{w'}} = 2$, which means $v = u$. This contradicts our assumption. QED.

b. $[\![\text{Fido shi liang zhi gou}]\!]_w = 1$ iff $[\![\text{Fido}]\!]_w \in \{a+b, b+c, a+c\}$, i.e. iff $\perp$

1.6.2 Generics

We now come to the generic reading of nominals. First, let us consider D-genericity, i.e. kind-predication exemplified by sentences such as 'dogs are extinct' or 'dogs are related to wolves.'

Chierchia (1998) advances a theory of kind reference which include the following assumptions. (i) There is a linguistic operator – which we will symbolize as "K" in this paper – that maps nominal predicates (i.e. expressions of type $< e,t >$) into names of kinds (i.e. expressions of type e). (ii) Kinds are "individual concepts of some sort [...] functions from worlds [...] into pluralities, the sum of all instances of the kind [...]." (iii) The operator is a partial function, which means that some nominal predicates are not in its domain, i.e. "not all individual concepts are going to be kinds" (Chierchia 1998: 349-350).

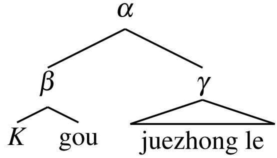
We will adopt these assumptions. We flesh out Chierchia's idea in the following definition of K.

(21) $[\![K]\!]_w \subseteq D_{<e,t>} \times G$
$[\![K\ X]\!]_w = \lambda w(MAX([\![X]\!]_w))$ if $[\![K\ X]\!]_w \in G$, undefined otherwise

Thus, K combines with a predicate X and yields an individual concept, a function from each possible world w to the maximal X-individual in w. Furthermore, the individual concept denoted by $[K\ X]$ must be a kind: $[K\ X]$ is undefined if it does not denote a kind.

Given the definition of K, it is clear how to generate kind-predication sentences, i.e. the D-generic reading. The LF of 'dog extinct' will be something like (22a), which will have the meaning that the kind dog, or canis, is extinct.

(22) a.



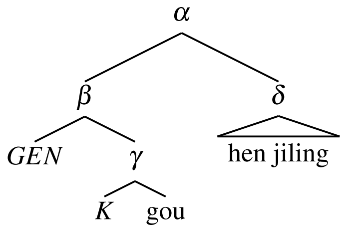
b. $[\![\alpha]\!]_w = 1$ iff canis $\in [\![\text{extinct}]\!]_w$

Let us now turn to the I-generic reading, as exemplified by sentences such as "dogs are intelligent." We will assume, following several works, that the I-generic reading comes about via a generic operator, *GEN*, which takes a kind and returns a generalized quantifier (Krifka 1987; Krifka et al. 1995; Chierchia 1998). Basically, *GEN* takes a kind and a predicate and returns true iff instances of the kind generally fall under the predicate. The definition of *GEN* is given in (23).[8]

(23) $[\![GEN\ X]\!]_w$ is defined iff $[\![X]\!]_w \in G$
If defined, $[\![GEN\ X]\!]_w = \lambda P_{<e,t>}(generally_x(x \leq [\![X]\!]_w(w) \to x \in P))$

So a sentence such as 'dogs are intelligent' will have the LF in (24).

(24) a.



b. $[\![\alpha]\!]_w = 1$ iff $generally_x(x \leq [\![K\ \text{gou}]\!]_w(w) \to x \in [\![\text{hen jiling}]\!]_w)$, i.e. iff it is generally the case that instances of canis in w are intelligent in w.

We have explain how bare nouns can have the generic reading, i.e. how they can denote kinds and restrict *GEN*. It remains to explain why classifier and numeral phrases cannot be generic. Again, we will base the explanation on an idea in Chierchia (1998: :350), namely that "something which is necessarily instantiated by just one individual [...] would not quality as a kind" (Chierchia 1998: 350). We explicate this idea by postulating the constraint in (25), which basically says that $[K\ X]$ would denote a kind only if for some world w', the sum individual which represents $[K\ X]$ in w' is plural. We have defined $[K\ X]$ as function from worlds to $MAX(X)$. This means that $[K\ X]$ is a kind only if $MAX(X)$ consists of more than one X-atoms in some possible world.

(25) $[\![K\ X]\!]_w \in G$ only if for some w', $|MAX([\![X]\!]_{w'})|^{AT([\![X]\!]_{w'})} > 1$.

Thus, a predicate like *gou* 'dog' can combine with *K* because there is a possible world where the maximal dog consists of more than one dog-atom. But a predicate like 'being identical to Gennaro Chierchia' will not be able to combine with K, because in every world, the maximal element in this predicate consists of exactly one Gennaro atom. Given (25), we can prove that *K* cannot combine with an atomic predicate, because if X is an atomic predicate, $MAX(X)$ is

[8] The generic operator assumed in Chierchia (1998) also selects a kind as its restrictor, even though this is not stated explicitly in Chierchia's paper (I thank Gennaro Chierchia for pointing this out to me). For how the word "generally" in the definition of *GEN* is to be understood, see Krifka (1987); Krifka et al. (1995).

either undefined or contain just one X-atom.[9]

(26) Theorem 4
$[\![K\ X]\!]_w$ is undefined if X is an atomic predicate

Because genericity is expressed via kind-reference, and kind reference requires cumulative predicates, it follows that classifier phrases and numeral phrases cannot have a generic interpretation, because as we have proved, both of these categories are atomic predicates.

1.6.3 Definites

We come now to the definite reading of nominals. Recall that in Chinese, only bare nouns can be definite. Given that only bare nouns can denote kind, this fact suggests that definiteness is also expressed via kind-reference in Chinese. It turns out that there is a very natural way that this can be done. We have defined kinds as function from worlds to maximal individuals, and it is run of the mills to analyze definiteness in terms of maximality (cf. Kadmon 1990; Roberts 2003; Sharvy 1980). So all we have to do is to define an operator EXT which takes an individual concept and applies it to the evaluation world.[10]

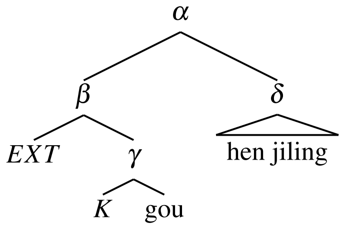
(27) $[\![EXT\ X]\!]_w = [\![X]\!]_w(w)$

This means that EXT combined with $[K\ X]$ will give us the meaning of 'the X.' It also means that only $[K\ X]$ can combine with EXT, because only $[K\ X]$ denotes an intension. And since only bare nouns can combine with K, only bare nouns can be definite. So the LF in (28a) will give us the meaning 'the dog is intelligent' in a world where there is exactly one dog, and the meaning 'the dogs are intelligent' in a world where there are more than one dogs.

[9] Theorem 4 is proved as follows. Let X be an atomic predicate and w' be a world. Given the definition of "atomic predicate" (13), $[\![X]\!]_{w'} = AT([\![X]\!]_{w'})$. We have proved in footnote 2 that $MAX([\![X]\!]_{w'})$ is defined only if $[\![X]\!]_{w'}$ is a singleton. Thus, $|MAX([\![X]\!]_{w'})|^{AT([\![X]\!]_{w'})} = n$ only if $n = 1$. Since w' is an arbitrary choice, no w'' is such that $|MAX([\![X]\!]_{w''})|^{AT([\![X]\!]_{w''})} = n$ and $n \neq 1$. This means that no w'' is such that $|MAX([\![X]\!]_{w''})|^{AT([\![X]\!]_{w''})} > 1$. Given the constraint on G (25), $[\![K\ X]\!]_w \notin G$, and given the definition of K (21), $[\![K\ X]\!]_w$ is undefined. QED.

[10] In this sense, EXT has the same function as the operator $^{\vee}$ of Montague (1973).

(28) a.

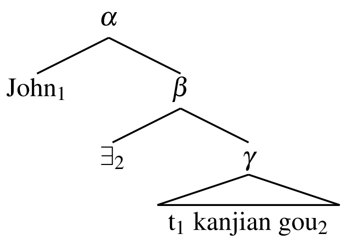


b. $[\![\alpha]\!]_w = 1$ iff $MAX([\![\text{gou}]\!]_w) \in [\![\text{hen jiling}]\!]_w$, i.e. iff the dog(s) in w is/are intelligent in w

1.6.4 Indefinites

Indefinite reading is only available to object nominals in Chinese. To account for the possibility of indefinite objects, we assume that verbs and objects in Chinese can compose via the rule of Restrict (Chung & Ladusaw 2004), and Existential Closure applies at the VP level, binding free variables in it (Heim 1982; Diesing 1992). To account for the impossibility of indefinite subjects in Chinese, we assume that subjects in Chinese cannot reconstruct into VP (Tsai 2001), hence cannot be existentially closed. The LF of *John kanjian gou* 'John saw dog' is given in (29a), its truth conditions in (29b).

(29) a.



b. $[\![\alpha]\!]_w = 1$ iff $\exists_x(saw(j,x) \wedge x \in [\![gou]\!]_w)$

By hypothesis, $[\![gou]\!]_w$ contains both singular and plural dogs, which means *John kanjian gou* is true iff John either saw a single dog, or he saw a plurality of dogs. This is the result we want (cf. (3)). If instead of *gou* 'dog,' we have the classifier phrase *zhi gou* 'CL dog' or the numeral phrase *yi zhi gou* 'one CL dog', we predict the sentence to have the implicature that John saw a single dog (cf. Zweig 2009).

2 Vietnamese

Vietnamese is a classifier language, just like Chinese. The two languages resemble each other with regard to every aspect of nominal syntax and semantics save the expression of definiteness. Recall that in Chinese, NPs (bare nouns) can be definite, while classifier phrases (CLP) and numeral phrases (NumP) cannot. Vietnamese differs from Chinese in a rather bizarre way: it shows the exact opposite. Classifier and numeral phrases can be definite in Vietnamese, while bare nouns cannot.

(30) a. Cho thich an thit
dog like eat meat
'Dogs / *The dog(s) like(s) to eat meat'

b. Con cho thich an thit
CL *dog like eat meat*
'The dog likes to eat meat'

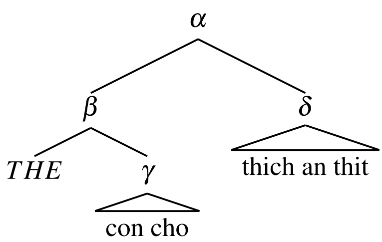
c. Hai con cho thich an thit
two CL *dog like eat meat*
'The two dogs like to eat meat'

Our account of this difference has two components. The first is the assumption that Chinese and Vietnamese differ with respect to lexical resource: instead of EXT, Vietnamese has THE, which is defined in (31).

(31) $[\![THE]\!]_w \subseteq D_{<e,t>} \times U$
$[\![THE\ X]\!]_w = MAX([\![X]\!]_w)$

This allows CLP's and NumP's to have the definite reading. The LF for (30b), for example, would be that in (32).

(32)



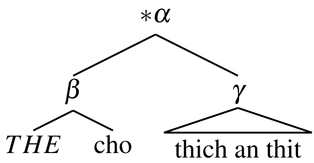
The second component of the account is a preference principle which says that when both K and THE *can* be used, i.e. when neither of them causes type mismatch, K *must* be used.[11]

[11] Chierchia (1998) proposes the same preference of the kind operator over the definite article. Chierchia's framework makes it possible to motivate this preference. The account developed here is incapable of this task. Thus, we will leave (33) as a primitive for the present.

(33) Preference Principle
Prefer K to THE!

The LF in (34) would then be ill-formed. This explains why bare nouns cannot be definite in Vietnamese.

(34)



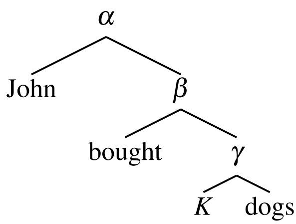
3 Remaining Issues and Conclusion

3.1 Inventory of Semantic Rules

The contrast in (35) in English motivates Chierchia's (1998) rule of Derived Kind Predication (DKP). (36) shows the LF of (35a) and how it is interpreted under application of DKP.

(35) a. John bought dogs
b. *John bought dog

(36) a.



b. $\text{DKP}([\![\alpha]\!]_w) = \exists_x(\textit{bought}(j,x) \wedge x \leq [\![K \text{ dogs}]\!]_w(w))$

Crucially, DKP requires the relevant nominal in the input to be a kind term. As *dogs* can and *dog* cannot denote a kind, we predict that DKP is inapplicable in (35b), while it is in (35a). Now in order to rule out (35b), we also have to say that English cannot express indefiniteness by way of Restrict/Existential Closure, since of it could, (35b) would be well-formed with the meaning of 'John bought a dog.'

Can we use DKP for Chinese and Vietnamese instead of Restrict and Existential Closure to effect the indefinite reading for bare nouns? The answer seems to be negative. Recall that we take numeral phrases in these languages to be of type $< e,t >$, and to be atomic predicates. This means that DKP cannot apply, since atomic predicates cannot be mapped to kinds. We would then predict that numeral phrases cannot be interpreted as indefinites, which is wrong. Now suppose we say numeral phrases are generalized quantifiers, i.e. expressions of type $< et, t >$. Then we would correctly predict the indefinite reading of these phrases to be possible, but we would also predict - incorrectly - that indefinite numeral phrases are possible in subject positions.

Thus, what we have to say is that English has DKP but not Restrict /Existential Closure, and Chinese and Vietnamese have Restrict/Existential Closure but not DKP. In other words, we have to assume that languages vary not only with respect to lexical representation, but also in the inventory of interpretive rules.

3.2 Conclusion

Research on how the mass count distinction plays out in different languages promises to inform our understanding of the relation between grammar, cognition and the physical world. Investigation of the contrast between number marking and classifier languages, and of the micro variation among languages of both types, should be of special relevance. A vast amount of work in the semantic literature has been devoted to the meaning of noun phrases in number marking languages. Analyses of classifier languages, however, have been fewer and less rigorous, and the micro variation between them has not received much attention. In this paper, we attempt to take a small step toward eliminating this discrepancy: we present a set of facts concerning the distribution and interpretation of nominals in two classifier languages – Mandarin and Vietnamese – and derive these facts from precisely formulated assumptions. Our proposal builds entirely on suggestions that have been made in previous works. Thus, we contribute no “new idea.” Our aim is rather to show which old ideas can be selected – and explicated in certain ways – to capture the observations, and what implications this has for the parametric theory of language.

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