On the Meaning of *Shenme* 'what' in Chinese Bare Conditionals and its Implications for Carlson's Semantics of Bare Plurals

Jo-wang Lin

Department of Foreign Languages and Literatures
National Chiao Tung University, Hsinchu, Taiwan, R.O.C.
Email:jowang@cc.nctu.edu.tw

Abstract

This paper shows that the semantics of *shenme* 'what' exhibits a double quantification phenomenon in Chinese bare conditionals. I show that such double quantification can be nicely accounted for if one adopts Carlosn's semantics of bare plurals and verb meanings as well as the assumption that *shenme* 'what' may denote kinds of things as bare plurals do.

1. Introduction

In this paper, I am going to examine the differences between *shei* 'who' an *shenme* 'what' in what Cheng and Huang (1996) refer to as "bare conditionals". In such constructions, the conditional and consequent clauses each contain a wh-phrase of the same form and the choice of value for the second wh-phrase varies with the choice of value for the first wh-phrase. This construction is illustrated in (1).

(1) Shei xian lai, shei xian chi
    who first come who first eat
    'If x comes first, x eats first./Whoever comes first eats first.'

I will show that the semantics of *shenme* 'what' and *shei* 'who' in such constructions differ with respect to how they refer. When the two wh-phrases in pair in bare conditionals involve *shei* 'who', they must refer to the same person as in (1); but when the wh-phrases in pair involve *shenme* 'what, they may refer to the same object as in (2) or they may refer to a different object but of the same kind as in (3).

(2) Wo zheli de dongxi, ni yao shenme, jiu na shenme
     I here Gen thing   you want what   then take what
    'As for my things here, if you want x, then you can take x.'
(3) a. Ni dapo shenme, jiu de qu mai shenme (lai pei)
       you break what   then must go buy what   to compensate
       Lit. 'If you break what, then you must go to buy what for compensation.'
    b. Gege you shenme, wo jiu ye yao you shenme
       brother have what   I   then also want have what

Lit. 'If my brother have what, then I also want to have what.'

(2) does not need comments; (3) is worth some more remarks. Imagine a situation where a person breaks a bowl and is asked to compensate for it. In this case, if (3a) is to be true, the person who broke the bowl has to buy a new bowl which is different from the original one for compensation. The meaning of *shenme* 'what' in (3a) can be compared with the meaning of *it* in (4).

(4) If you break a bowl, then you have to buy it for compensation.

Unlike (3a), for (4) to be true, what you have to buy for compensation is the original bowl, which is broken. The contrast between (3a) and (4) is similar to the contrast between (5) and (4), that is, between *it* and *one*.

(5) If you break a glass, then you have to buy (another) one for compensation.

Similar remarks apply to (3b). (3b) can be true in a situation where someone buys a new computer and his younger brother wants to have a computer too. In this situation, the two computers need not be the same one though they could be of the same brand. It thus seems that the *shenme*-anaphora seen in (3) is more like *one*-anaphora than *it*-anaphora.

In fact, a large number of bare conditionals involving *shenme* 'what' are ambiguous between the object-identity reading and the non-object-identity reading. One such example is (6).

(6) Ni   xiang chi shenme, mama   jiu zhu   shenme gei ni   chi
    you want   eat what   mother then cook what   for you eat
    a. 'If you like to eat x, then mother cooks x for you to eat.'
    b. 'If you like to eat something of kind x, then mother will cook something of that kind for you to eat.'

The purpose of this paper is to discuss what makes the interpretation of the two wh-phrases different and how this difference can be accounted for. I will show that *shei* 'who' and *shenme* 'what' actually have different kinds of denotations. While *shei* 'who' denotes the same type of things as proper names and definite descriptions, *shenme* 'what' may also denote the same type of things as bare NPs, in additional to proper names and definite descriptions. On the basis of this, I will suggest that in addition to 'thing x', *shenme* 'what' should also be optionally analyzed as 'kind x', parallel to the analysis of bare nouns. This, together with Carlson's (1977) semantics of bare plurals and verb meanings, will account for why *shenme*-anaphora behaves like English *one*-anaphora. Apart from the above issue, I will also show that unlike Carlson's approach to bare plurals, Wilkinson's (1996) approach cannot be carried over to Chinese bare conditionals. Finally, I will examine Heim's (1987) proposal of treating *what* as a disguised expression of 'something of kind x', showing that it cannot be extended to Chinese bare conditionals, either.

2. A Distinction Between *Shei* 'who' and *Shenme* 'what'

Consider the contrast between (7) and (8).

(7) Q: Ni   xihuan shei
        you like   who
         'Who do you like?'
    A: Wo xihuan Zhangsan/nei-ge nühai
        I   like   Zhangsan/that-Cl girl
         'I like Zhangsan/that girl.'
    A': *Wo xihuan nühai/jinfa-nülang
        I   like   girl/golden-hair-girl
         'I like girls/blondes.
(8) Q: Ni   xihuan shenme
        you like   what
         'What do you like?'
    A: Wo xihuan zhe-ben shu
        I   like   this-Cl book
         'I like this book.'
    A': Wo xihuan shu
        I   like   book
         'I like books.'

The examples in (7) and (8) show that to answer a *shei*-question, either a proper name or a definite description is an appropriate answer, but a bare NP is not. On the other hand, to answer a *shenme*-question, one can respond with either a definite description or a bare NP. *Shei* 'who' and *shenme* 'what' thus allow different ranges of possible answers. I take this fact to be an indication that the two wh-phrases permit different types of denotations. *Shei* 'who' may denote something of the same type as proper names or definite descriptions, whereas *shenme* 'what' may denote something of the same type as proper names, definite descriptions or bare NPs. It should be noticed here that Chinese does not have a plural marker. Therefore bare plurals take the form of bare nouns. I will show that the above distinction between *shei* 'who' and *shenme* 'what', coupled with Carlson's semantics of bare plurals to be discussed in the next section, will account for the non-object-identity reading of *shenme* 'what' in bare-conditionals.

3. Carlson's Semantics of Bare Plurals

It is well-known that bare plurals do not have a constant interpretation, as is illustrated by the examples in (9).

(9) a. Dogs are intelligent.
    b. Dogs are available.
    c. Dogs are widespread.

In (9a), the bare plural *dogs* seems to have the force of the quantifier *most or almost all* in that exceptions are admitted. As for (9b), it is appropriate to say that existential force is involved.

Finally, none of the above interpretations is appropriate for the bare plural *dogs* in (9c). Here it seems to refer to a kind of animals. Despite the variety of interpretations seen in bare plurals, Carlson (1977a, 1977b) argues that they are uniformly kind-denoting terms and that the various interpretations do not result from the ambiguity of the bare plurals themselves but can be attributed predictably to some aspect of the predicate/context which they occur with/in. According to Carlson, there are three subdomains of ontological entities in the world: stages, which are "time-space slices of individuals", objects, which are the most familiar things like *Jimmy Carter* or *this chair* , and kinds, which are individuals themselves such as the species dogs or horses. Since the predicate *widespread* in (9c) applies exclusively to kinds and the bare plural *dogs* is a kind-denoting term, (9c) translates as (10).

(10) Widespread'(d)

("d" in (10) stands for the kind of animals that are dogs.) On the other hand, the predicate *intelligent* in (9a) basically applies to objects but can be elevated by the "gnomic" operator *Gn* to a kind-level predicate, therefore giving the bare plural generic attribution. The translation of (9b) is (11).

(11) *Gn*($^\wedge$intelligent')(d)

Finally, stage-level predicates select existential readings. Carlson argues that this is "the result of applying a predicate which makes a claim about stages to the bare plural". According to him, a stage-level predicate such as *available* translates as (12), where R represents a realization relation, x^k a kind-level variable and y^s a stage-level variable.)

(12) available: $\lambda x^i \exists y^s [R(y,x)$ & available'(y)]

Thus, when the predicate *available* is applied to *dogs*, whose translation is $\lambda P^\vee P(d)$, we get the semantic interpretation (13).

(13) $\lambda P^\vee P(d)(^\wedge \lambda x^k \exists y^s [R(y,x)$ & available'(y)])

    $= \exists y^s [R(y,d)$ & available'(y)]   (after λ-reduction)

When a stage-level predicate is generalized, it can also give a generic attribution to its subject, giving a generic reading. I omit the details here. This way, Carlson successfully accounts for why bare plurals may have a variety of interpretations, though they are uniformly analyzed as kind-denoting terms.

4. A Semantic Analysis of Bare-conditional Donkey Sentences

As mentioned, proper names and definite descriptions denote the type of entity of what Carlson calls objects. Since the denotation of *shei* 'who' ranges over the same kind of individuals as proper names and definite descriptions, on the assumption that *shei* 'who' is a proform of proper

names and definite descriptions, it must introduce object-level variables in bare conditionals. On the other hand, the denotation of *shenme* 'what' ranges over the same kind of entities as proper names, definite descriptions and bare nouns. So, on the assumption that *shenme* 'what' is a proform of proper names, definite descriptions and bare nouns, it should be able to introduce kind-level variables--if Chinese bare NPs denote kinds of things as I will argue later, in addition to object-level variables. I show below that this distinction is the key to unmasking the puzzle why bare-conditional donkey sentences involving *shei* 'who' are never ambiguous but those involving *shenme* 'what' can be ambiguous.

To begin with, some assumptions are in order. Following Cheng and Huang (1996) and Lin (1996), I assume that wh-phrases in Chinese "bare conditionals" introduce restricted free variables that must be bound by some operator around the construction. Also, I assume with Kratzer (1978), Heim (1982) and Kadmon (1987) that if a conditional does not contain an overt operator for the conditional clause to restrict, it can be understood as involving a null necessity operator or a covert adverb of quantification roughly equivalent to *generally* or *always*. These null operators can bind the variables introduced by the wh-phrases (Cheng and Huang (1996) and Lin (1996)).

Now consider (3) again, repeated below.

(3) shei xian lai,   shei xian chi
    who first come who first eat
    'If x comes first, x eats first.'

Since the wh-phrase *shei* 'who' only introduces an object-level variable, the tripartite structure of (3) is (14), where the universal quantifier represents the implicit adverb of quantification of the bare conditional.

(14) $\forall x^o$ [x^o is a person and x^o comes first] [x^o is a person and x^o eats first]

In (14), since the object-level variable x^o in the restriction and the one in the nuclear scope are semantically bound by the same implicit universal operator, the value for the two variables is always the same. This explains why the two *shei's* 'who' in (3) must refer to the same individual.

Next, let us consider the case of *shenme* 'what'. As discussed previously, (8) contrasts with (3) in that the two wh-phrases do not refer to the same object, though they involve a higher level identity.

(8) Ni   dapo shenme, jiu   de   qu mai shenme (lai pei)
    you break what   then must go buy what   to compensate
    'Lit. If you break what, then you have to buy what for compensation.'

(8) has a reading equivalent to something like "If you break a glass, then you have to go to buy a

glass for compensation. If you break a bowl, then you have to go to buy a bowl for compensation. If you break a plate, then you have to go to buy a plate for compensation. And so on and so forth". In other words, for any value assignment which makes the conditional clause in (8) true, it should also make the consequent clause true and this value must be a kind of things. Moreover, given a kind of things as the value for the wh-phrase *shenme* 'what', that kind of things is understood as being existentially quantified. Imagine a glass-breaking event. If a glass-breaking event takes place, one certainly does not break all the glasses that constitute the kind of things called glass but some glass(es) that realize(s) that kind. Likewise, one can only buy some objects realizing the kind of things called glass but not the kind itself, because the verb *mai* 'buy' does not apply to a kind-level entity. One can paraphrase this semantic intuition of (8) as follows.

(15) For any kind of thing x, if there exists some object y of kind x that you break, then there
    must exist some object z of kind x such that you go to buy z for compensation.

If this paraphrase of (8) is correct, this means that the two *shenme*'s in (8) must simultaneously involve existential quantification over object-level variables and universal quantification over kind-level variables. How is this double quantification possible? Doesn't the wh-phrase *shenme* 'what' introduce a single variable under Kamp's (1981) or Heim's (1982) analysis of indefinites?

A solution to the above puzzle suggests itself when one recalls Carlson's (1977) semantics of bare plurals and verb meanings. Recall that the denotation of *shenme* 'what' ranges over bare nouns, proper names and definite descriptions. Thus, on the assumption that *shenme* 'what' is a proform of bare nouns, it is reasonable to assume that *shenme* 'what' can have a denotation similar to that of bare nouns, in addition to that of proper names and definite descriptions. Now suppose that one analyzes Chinese bare nouns the same way as Carlson (1977) analyzes English bare plurals; that is, bare nouns are names of kinds of things. In fact, Krifka (1995) has argued for this position for Chinese bare nouns. Then, it is reasonable to say that the indefinite wh-phrase *shenme* 'what' can introduce either a kind-level variable or an object-level variable. If the wh-phrase *shenme* in (8) introduces a kind-level variable, then coupled with Carlson's style of verb meanings for *dapo* 'break' and *mai* 'buy', (16) will be the logical form of (8).

(16) $\forall x^k [\exists w^s [R(w,x^k) \ \& \ break'(you',w)]][\exists z^s [R(z,x^k) \ \& \ go\text{-}to\text{-}buy\text{-}for\text{-}compensation'(you',z)]]$

(16) claims that for all x, x a kind of things, if you break some stage of x, then you have to go to buy some stage of x. The translation (16) captures the intuition that both wh-phrases in (8) have existential force. They have existential force because verbs like *dapo* 'break' and *mai* 'buy' have existential quantification over stage-level variables as part of their meaning when their object is a kind (as in Carlson's analysis of *available* in (12).) The non-object-identity reading of (8) is therefore explained, because each stage variable is bound by an independent existential quantifier introduced by the verb meaning. Moreover, since stages of a kind may be different, the stage of some kind of things that you break and the stage that you buy for compensation need not be the same. Apart from the stage-level variables bound by the existential quantifier, the logical form of (16) also contains kind-level variables. These variables are those introduced by the two *shenme*'s 'what' and are bound by the implicit universal operator of the conditional. It is the binding of the

kind-level variables by the implicit universal operator that is responsible for the intuition that the two *shenme*'s in (8) involve a higher level identity though they do not denote the same object-level individual. We thus account for why the wh-phrase *shenme* 'what' in (8) seems to involve double quantification and why *shenme*-anaphora in this case is more like *one*-anaphora than *it*-anaphora.

The above approach also accounts for why (13) is ambiguous.

(6) Ni   xiang chi shenme, mama   jiu zhu   shenme gei ni   chi
    you want   eat what   mother then cook what   to you eat
    a. 'If you like to eat x, then mother will cook x for you to eat.'
    b. 'If you like to eat something of kind x, then mother will cook something of that kind for
        you to eat.'

The ambiguity of (6) arises simply because the wh-phrase *shenme* 'what' can introduce an object-level variable as well as a kind-level variable. If an object-level variable is introduced by the two wh-phrases in (6), they will semantically refer to the same individual; on the other hand, if kind-level variables are introduced, the two wh-phrases only refer to the same kinds of things, but not the same objects.

5. Wilkinson's (1991) Semantics of Bare Plurals

As discussed above, Carlson has uniformly analyzed bare plurals as kind-denoting terms and treated existential readings as a result of verbs applying to stages. However, this analysis has been attacked by Wilkinson (1991), who tries to eliminate stages from Carlson's ontology of things. In this section, based on the result in section 4, I will show that Carlson's existential quantification over stages is independently needed, at least, in Chinese bare-conditional donkey sentences. I will first briefly outline Wilkinson's (1991) analysis of bare plurals and then show that her approach fails to account for existential interpretation seen in bare-conditional donkey sentences.

Opposing Carlson's stand, Wilkinson (1991) has argued that bare plurals are ambiguous between names of kinds and variable interpretations. According to her view, bare plurals are kind-denoting terms when they are subjects of predicates which apply exclusively to kinds such as *common*, *widespread* or *extinct*, but can be analyzed along the lines of Kamp (1981) and Heim (1982) when they are subjects of stage-level or individual-level predicates. Thus, unlike Carlson's analysis which would translate (17) and (18) as (19) and (20), respectively, she would translate the same sentences as something like (21) and (22).

(17) Fireman are available. (stage-level, existential reading)
(18) Fireman are altruistic. (individual-level, generic reading)
(19) $\exists x^S[R(x, f) \& available'(x)]$
(20) $Gn(^\wedge altruistic')(f)$
(21) $\exists_x[fireman'(x) \& available'(x)]$

(22) $Gen_x[fireman'(x)][altruistic'(x)]$

On Wilkinson's analysis, the existential reading of (17) arises because the individual variables introduced by the bare plural are bound by the existential closure operator (See Heim (1982), Diesing (1990,1992)). On the basis of this analysis, Wilkinson argues that existential quantification over stages is not necessary. She also argues that Carlson's habitual sentences have an alternative explanation along the lines of Stump (1985) and hence the use of stages can be eliminated in those cases. Since habitual sentences are not the concern of this paper, I will not go into the detail. On the other hand, Wilkinson attributes the generic reading of (18) to the fact that the sentence structure contains a generic operator. It is this generic operator that binds the variable introduced by the bare plural. She proposes that the generic operator is something like an adverb of quantification such as *generally* or *typically.*

Despite Wilkinson's attack on Carlson's analysis, I think that Carlson's account for existential readings of bare plurals in terms of stages and verb meanings is needed in the theory of grammar.

Let us consider (8) again.

(8) Ni   dapo shenme, jiu de   qu mai   shenme (lai pei)
     you break what   then must go buy   what   to compensate
     'If you break something of kind x, then you have to buy something of kind x (for compensation).'

As discussed in the last subsection, the semantics of (8) involves double quantification, namely, a universal quantification over kinds of things and an existential quantification over objects that realize those kinds of things. I have shown that the existential interpretation of the two wh-phrases in (8) is a consequence of applying the meaning of the verbs *dapo* 'break' and *mai* 'buy' to NPs denoting kinds. The problem now is: can Wilkinson's (1991) approach to English bare plurals be extended to sentences like (8)? If like my analysis, she also assumes that *shenme* 'what' is a proform of proper names, definite descriptions and bare nouns, then *shenme* 'what' under her analysis should be able to denote kind-level as well as object-level variables. Moreover, the distribution of these two kinds of variables should be determined by the predicates which take the variables as arguments. Namely, kind-level variables must be chosen when they are subjects or objects of predicates which apply exclusively to kinds. Elsewhere, object-level variables must be the denotation of the wh-phrases. These assumptions, however, would lead (8) to a nonexistent reading. In (8), since the verb *dapo* 'break' and *mai* 'buy' are not among those predicates which apply exclusively to kinds, the two *shenme*'s 'what' must introduce object-level variables rather than kind-level variables. It follows that the object that you break and the object that you buy must be the same one, because both variables are bound by the same universal operator. However, (8) does not have this reading.

I should note here that even if the two *shenme's* in (8) can introduce kind-level variables in violation of Wilkinson's own assumption, the reading thus derived is still not right. On this analysis, the logical form of (8) should be (23) below.

(23) $\forall x^k$[you break x^k][you have to go to buy x^k for compensation]

In (23), the kind-level variable x^k is bound by the universal quantifier, thus explaining universal quantification over kinds of things. However, the logical form in (23) is inadequate. As noted, one can only break or buy some objects/stages that realize a kind of things but cannot break or buy the kind itself; namely, the wh-phrases in (8) must also be understood as being existentially quantified. But this part of existential meaning is missing in (23). In order to have existential quantification over objects, an object-level variable must appear. Yet no such variable seems available under Wilkinson's approach, because presumably one wh-phrase only introduces one variable at one time. There is no doubt that extra justification is needed if one wants to claim that a single wh-phrase such as *shenme* 'what' can denote something like 'object x of kind y', i.e., introducing two different variables at one time. Since I know of no evidence that a single indefinite can introduce two different variables at one time, I take (8) to be evidence that Carlson's explanation of existential interpretation of bare plurals in terms of stages and verb meanings is at least supported by Chinese data.

6. Heim's Analysis of *What*

My above analysis of the meaning of *shenme* 'what' in Chinese bare conditionals is closely related to Heim's (1987) analysis of the meaning of English interrogative *what* in *there*-insertion constructions. Safir (1985) has reported the judgements of the following examples.

(24) Which one of the two men was there ??in the room/*drunk?
(25) Which actors were there ??in the room/?*laughing?
(26) ?Who was there in the room when you got home?

However, Heim (1987) has found that (27) is completely acceptable.

(27) What is there in Austin?

As is well-known, definite NPs are not allowed to appear after *there* in *there*-insertion construction. The above examples thus suggest that *which* is strong, just like *that*, whereas *what* seems to be weak. In order to explain why *what* is acceptable in a *there*-insertion construction such as (27), Heim first discusses (28).

(28) How many women do you blame?

She argues that to properly interpret (28), it must be semantically analyzed or reconstructed as something equivalent to *?you blame x-many women*, where x is quantified in by *how*. Namely, the semantic analysis of *how many N*-questions involve reconstructing the wh-phrase back to its pre-movement position except for the interrogative operator. Since *x-many* must qualify as weak by any semantic definition in spite of the definiteness of the variable *x*, *how many N* can certainly

appear in *there*-insertion constructions.

Heim tries to assimilate the analysis of *what* to pied-piped wh-phrases such as *how many N*. She suggests that wh-movement of *what* can be treated as some sort of pied-piping in disguise, similar to wh-movement of *how many N*. She proposes that *what* should be analyzed as though it were 'something of what kind'. Therefore, a *what*-question involves reconstructing back 'something of kind x' to its pre-movement position and only the variable *x* is bound by the interrogative operator in Comp. Since 'something of kind x' is transparently indefinite, it follows that the trace of *what* can appear after *there* in *there*-insertion constructions.

From the above discussion, it seems that my analysis of *shenme* 'what' in Chinese bare conditionals is somewhat similar to Heim's analysis of English *what* in *there*-insertion constructions. In this sense, Chinese bare conditionals can be said to support her analysis of *what* as involving a kind-level variable. Nevertheless, one crucial difference between Heim's analysis of English *what* in *there*-insertion constructions and my analysis of the kind-level *shenme* in Chinese bare conditionals cannot be ignored. Under my analysis, the semantics of the kind-level *shenme* 'what' in bare conditionals introduces only a kind-level variable and that is all there is for the meaning of the kind-level *shenme* 'what'. Existential quantification over objects that realize the kind is ascribed to the verb meaning rather than to the meaning of *shenme* 'what' itself. But Heim's analysis of English *what* is different. Apart from introducing a kind-level variable, the meaning of *what* also incorporates existential quantification over object-level things. Does this difference makes any significant prediction?

Substituting Heim's analysis of English *what* for my analysis of Chinese *shenme* 'what' will, in most cases, not make any difference for the truth conditions of Chinese bare conditionals. In particular, her analysis of English *what* can also explain why in examples like (8), the two *shenme*'s need not refer to the same object, though they involve a higher level identity with respect to kinds. They need not be coreferential with respect to object-level things, because each *shenme* 'what' has its own existential quantifier. But the kind-level variables must be bound by the same implicit universal operator, or vacuous quantification will result (Cheng and Huang (1996)). However, in some cases, Heim's analysis of *what* seems to fail to assign a bare conditional a proper truth conditions.

Consider (29).

(29) (Kan) shenme bijiao you jinian   jiazhi erqie women ye   mai-de-qi de,
        see   what   more have memorial value and   we   also buy-can-afford
     women jiu   song shenme
     we   then give what
     'If x has more memorial value and we can afford x, then we will give him/her/them x.'

Observe that the antecedent clause in (29) involves a coordinate conjunction with a shared-wh-constituent. Namely, the wh-phrase *shenme* 'what' in the conditional clause is simultaneously the subject of the verb phrase *bijiao you jinian jiazhi* 'have more value' and the object of the second verb *mai-de-qi* 'can afford'. What is significant about this fact is that the verb phrase in the first

coordinate and the verb in the second coordinate seem to select a different interpretation for the shared wh-phrase. Notice that the interpretation of (29) can be said to be equivalent to the following: If watches have more memorial value and we can afford to buy one, then we will give a watch; If necklaces have more memorial value and we can afford to buy one, then we will give a necklace; and so on and so forth. In this interpretation, there is no particular watch or necklace that has more value. It is the kind of things called watches or necklaces as a whole that has more value. In other words, the verb phrase *bijiao you jinian jiazhi* in (29) selects a kind-level subject. In contrast, the verb *mai-de-qi* 'can afford to buy', does not seem to select a kind-level object, because people only buy (some) objects of a kind of thing, rather than buying the kind itself. ((29) also has another reading in which the wh-phrase refers to an object-level entity. This reading is not relevant to my discussion here.)

Above we have seen that the shared wh-phrase *shenme* 'what' in (29) can be interpreted differently according to the predicate it combines with. However, this cannot be achieved by extending Heim's analysis of *what* to Chinese *shenme* 'what'. Although theoretically, Heim's analysis allows *shenme* 'what' to denote either 'something of kind x' or 'kind x', it seems impossible to say that one and the same wh-phrase can have two different denotations at the same time in one single derivation. Thus, one of the coordinate in (29) will receive no interpretation. In contrast, under my treatment of *shenme* 'what' as denoting a kind variable, the different interpretations of *shenme* 'what' can be ascribed to the different semantics of the predicate and the across-the-board transformation.

7. Conclusion

As discussed in the text, the semantics of *shenme* 'what' in Chinese bare conditionals exhibits a double quantification phenomenon. I have argued that such double quantification can be nicely accounted for if one adopts Carlson's semantics of bare plurals and verb meanings as well as the following two assumptions: (i) *shenme* 'what' is a proform of bare NPs and hence has the same kind of denotation as bare NPs, and (ii) Chinese bare NPs are names of kinds of things. This analysis of Chinese bare conditionals lends support to Carlson's approach to bare plurals despite Wilkinson's attack on it. I also have shown that an extension of Heim's analysis of *what* as 'something of kind x' to Chinese bare conditionals encounters problems when *shenme* 'what' is a shared constituent of a predicate which applies to kinds and another predicate which applies to objects.

8. References

[1] Bennett, Michael (1974) *Some Extensions of a Montague Fragment of English*, UCLA dissertation [published 1976 by Indiana University Linguistics Club Bloomington].
[2] Carlson, Gregory N. (1977a) "A Unified Analysis of the English Bare Plural", *Linguistics and Philosophy* 1: 413-456.
[3] Carlson, Gregory N. (1977b) *Reference to Kinds in English*, Ph.D. Dissertation, University of Massachusetts, Amherst.
[4] Carlson, Gregory N. and Francis Jeffry Pelletier (1995) *The Generic Book*, The University of

Chicago Press, Chicago and London.

[5] Cheng, L.-S. Lisa and C.-T. James Huang (1996) "Two Types of Donkey Sentences," *Natural Language Semantics* 4, 121-163

[6] Diesing, Molly (1990) *The Syntactic Roots of Semantic Partition*, Ph.D. Dissertation, University of Massachusetts, Amherst.

[7] Diesing, Molly (1992) *Indefinites*, The MIT Press, Massachusetts.

[8] Heim, Irene (1982) *The Semantics of Definite and Indefinite Noun Phrases*, Ph.D. Dissertation, University of Massachusetts, Amherst.

[9] Heim, Irene (1987) "Where Does the Definiteness Restriction Apply? Evidence From the Definiteness of Variables", in Eric J. Reuland and Alice G. B. ter Meulen (eds.) *The Representation of (In)definiteness*, MIT Press, Cambridge.

[10] Hoeksema, Jack (1983) "Plurality and Conjunction", in Alice G. B. ter Meulen (ed.) Foris, Dordrecht, pp. 63-84.

[11] Huang, C.-T. James (1987) "Existential Sentences in Chinese and (In)definiteness," in Eric J. Reuland and Alice G. B. ter Meulen (eds.) *The Representation of (In)definiteness*, MIT Press, Cambridge, 226-253.

[12] Kamp, Hans (1981) "A Theory of Truth and Semantic Interpretation," in Jeroen Groenendijk, Theo Janssen, and Martin Stokhof (eds.) *Formal Methods in the Study of Language: Proceedings of the Third Amsterdam Colloquium*, Part I, Mathematical Centre Tracts, Amsterdam, 277-321.

[13] Kratzer, Angelika (1978) Semantik der Rede: Kontext-theorie, Modalwörter, Konditionalsätze, Scriptor, Königstein.

[14] Krifka, Manfred (1995) "Commons: A Contrastive Analysis of Chinese And English" in Gregory N. Carlson and Francis Jeffry Pelletier (eds.) *The Generic Book*, The University of Chicago Press, Chicago and London.

[15] Lin, Jo-wang (1996) *Polarity Licensing And Wh-phrase Quantification in Chinese*, Ph.D dissertation, University of Massachusetts, Amherst, Massachusetts.

[16] Link, Godehard (1983) "The Logical Analysis of Plurals and Mass Terms: A Lattice-theoretic Approach," in Rainer B*uerle, Christoph Schwarze, and Arnim von Stechow (eds.) *Meaning, Use, and Interpretation of Language*, de Gruyter, Berlin, 302-323.

[17] Safir, Kenneth (1985) *Syntactic Chains*, Cambridge University Press, New York.

[18] Stump, Gregory T. (1985) *The Semantic Variablility of Absolute Constructions*, Reidel, Dordrect.

[19] Scha, Remko (1981) "distributive, Collective and Cumulative Quantification," in J. Groenendijk, T. Janssen and M. Stokhof (eds.) formal Methods in the Study of Language, Mathematical Center Tracts, Amsterdam, pp. 483-512.

[20] Wilkinson, Karina (1991) Studies in the Semantics of Generic Noun Phrases, Ph.D dissertation, University of Massachusetts, Amherst, Massachusetts.