

On Wh... Dou Constructions

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ABSTRACT

This paper discusses the syntax and semantics of *wh... dou* constructions which I argue are elliptical *wulun*-constructions. I show that *whlun* 'no matter' can select either a question or a *wh*-NP as its complement. Semantically, *wulun* is treated as an operator which forms the union of the extension of its complement. The function of *dou* in *wh... dou* constructions is to distribute over the members of the generalized union formed by the possibly null *whlun*. I show that this analysis is empirically more adequate and theoretically neater than Lee's (1986) and Cheng's (1991, 1995) treatments of the same constructions.

Key Words: Wh... dou constructions, *Wulun* 'no matter', Distribution Operator

1. Introduction

Chinese *wh*-phrases may obtain a universal interpretation when they occur with *dou*, as illustrated by the examples in (1) (Ting, et al. 1961, Zhu 1982, Huang 1982, Lee 1986).

- (1) a. *Shei dou keyi lai*
who all may come
'For any x, x a person, x may come.'
- b. *Shenme shu ta dou kan*
what book he all read
'For any x, x a kind of book, he reads x.'
- c. *Ta shenme shu dou kan*
he what book all read
'For any x, x a kind of book, he reads x.'

This paper aims to present an explicit syntactic and semantic analysis of the

above constructions which will be hereafter referred to as *wh... dou* constructions.

It has been often noted that the *wh*-phrase in *wh... dou* constructions can be optionally prefixed by words like *buguan*, *wulun*, or *bulun*, all of which have a meaning much like that of English *no matter* (Yu 1965, Ma 1982, Tang 1981, Shao and Zhao 1989, Huang 1994). This is demonstrated by the examples in (2).¹

- (2) a. (Wulun) shei dou keyi lai
 no-matter who all can come
 'No matter who can come.'
- b. (Wulun) shei wo dou bu xiangxin
 no-matter who I all not believe
 'I do not believe no matter who.'
- c. (Wulun) shenme kunnan dou neng kefu
 no-matter what difficulty all can overcome
 'No matter what difficulty can be overcome.'
- d. (Wulun) shenme rou, ta dou bu chi
 no matter what meat he all not eat
 'He does not eat no matter what meat.'

The possibility of adding words like *wulun* 'no matter' to *wh... dou* constructions without changing the meaning of the sentence suggests that possibly the constructions under consideration always contain an implicit *wulun* 'no matter' which might be deleted at PF but present at LF. Actually, this line of thought has been recently suggested by Shi-zhe Huang (1994).

Another crucial property of *wh... dou* constructions is that the *wh*-phrases in such constructions seem to have a free choice interpretation. For example, (2a) can be paraphrased as *Anybody can come* and (2c) as *Any difficulty can be overcome*.

In this paper, I will further explore the idea that *wh... dou* constructions are bare *wulun*-constructions with an implicit *wulun* 'no matter'. I will discuss the syntax and semantics of *wulun*-constructions in detail and show how the free choice interpretation of *wh... dou* constructions is yielded.

1. The glosses in (2) do not correspond to grammatical English sentences. One can understand *no matter who* and the like as equivalent to free choice *any*-NP's such as *anybody*.

2. The Syntax of *Wulun*-constructions

2.1 Sentential *Wulun*-constructions

Consider (3).

- (3) a. (*Wulun/buguan*) ni zuo shenme, wo **dou** mei yijian
 no-matter you do what I all not opinion
 'No matter what you do, I won't have an opinion.'
 b. (*Wulun/buguan*) ni yaoqing shei, wo **dou** huanying ta
 no-matter you invite who I all welcome him
 'No matter whom you invite, I will welcome him.'

It is obvious that in (3a) and (3b), *wulun* 'no matter' takes a clause as its complement. However, only a question-like clause may serve as the complement of *wulun* 'no matter' (See also Cheng and Huang (1996) and Zaefferer (1990)). That the complement clause of *wulun* 'no matter' is a question is proved by the fact that *wulun* 'no matter' can take an A-not-A question, a special type of alternative question in Chinese, as its complement, as (4) shows.

- (4) *Wulun/buguan* ni qu-bu-qu, wo dou yao qu
 no-matter you go-not-go I all want go
 'No matter whether you go or not, I want to go.'

There are a few other aspects about Chinese *wulun*-constructions which deserve mentioning. First, such constructions require that *dou* is present in the main clause. Without *dou*, the sentence is ungrammatical, as shown by (5).

- (5)**Wulun* shei lai, wo huanying ta
 no-matter who come I welcome him
 'No matter who comes, I welcome him.'

In this respect, Chinese *wulun*-sentences differ from English *no-matter* sentences, which do not have a word corresponding to *dou* in the main clause. Second, as indicated by the parentheses in (3), *wulun* 'no matter' is an optional element whose absence does not affect the meaning of the whole sentence. This differs from English *no-matter* which is not deletable. Third, one can distinguish three types of *wulun*-sentences. The first type involves examples like (3a) or (4), in which the wh-phrase in the *wulun*-clause is not related to any argument of the

main clause. Such examples contrast with examples like (3b), in which the wh-phrase inside the *wulun*-clause is related to a pronoun in the main clause. The final type is concerned with the following kind of example.²

- (6) *Wulun ta yaoqing shei, pro dou bu guan wo-de shi*
 no-matter he invite who all not relate my business
 'No matter whom he invites, it is none of my business.'

In (6) we have an empty *pro* subject which is base-generated in the main clause. This empty *pro* subject is not related to the wh-phrase *shei* 'who' in the *wulun*-clause but to the proposition expressed by the wh-clause. The interpretation of (6) is something like this: That he invites John is none of my business, that he invites Bill is none of my business, that he invites Mary is none of my business . . . and so on and so forth. (7) represents a similar case of such kind of interpretation.

- (7) *Wulun ta qu haishi bu qu, pro dou yu wo wu guan*
 no-matter he go or not go all with me no relation
 'No matter whether he goes or he does not go, it has no relation with me.'

The empty *pro* subject in the main clause in (7) refers to either the proposition that he goes or the proposition that he does not go. It is necessary to point out that Chinese does not use an inanimate pronoun to refer to a proposition. Therefore, the subject of the main clause in (6) and (7) can only be a silent pronoun.

2. A reviewer asks if there is any argument against treating the *wulun*-clause in (6) or (7) as sentential subject of the main clause, comparable to the English sentence in (i).

(i) [Whether he comes or not] is irrelevant.

I do not have any negative argument against the reviewer's suggestion at this point but I do have positive arguments in support of the treatment of the *wulun*-clauses in (6) and (7) as an adverbial clause. First, examples like (4) show that *wulun*-clauses can indeed be an adverbial clause. It is only a null hypothesis to assume the same for structures like (6) and (7). Second, there seems to be a general requirement that an adverbial conditional clause in Chinese, irrespective of its kind, is related to a particular particle in the main clause. For example, *ruguo* 'if' is paired with *jiu*, *zhiyou* 'only if' and *chufei* 'unless' with *cai*. It seems that the pairing between *wulun* 'no matter' and *dou* is another instantiation of the same pattern. On the other hand, a pure wh-clause in subject position does not require presence of any particle, as is shown by (ii).

(ii) *Ta shuo shenme (bing) bu zongyao, zongyao de shi . . .*
 he say what actually not important important DE be
 'What he said is (actually) not important. What is important is . . .'

Summarizing the discussion in this section, *wulun* ‘no matter’ can take a question as its argument, forming an adverbial which modifies the main clause.³ Three subtypes of *wulun*-sentences can be distinguished. One kind of *wulun*-sentence has a pronoun in the main clause anaphoric to a wh-phrase inside the wh-question selected by *wulun* ‘no matter’. The second kind of *wulun*-sentence has a pronoun in the main clause anaphoric to the wh-clause as a whole rather than to a wh-phrase inside the wh-clause. The final type of *wulun*-sentence simply has no anaphoric link between the main clause and the *wulun*-clause.

2.2 Nominal *Wulun*-constructions

In the last section, we have seen that *wulun* ‘no matter’ may take a wh-clause as its complement. However, when we look at the examples in (2), it does not seem that *wulun* ‘no matter’ takes a full clause as its complement. In those examples, *wulun* ‘no matter’ is followed by a wh-NP and nothing else. This raises the question of how a *wulun* + wh-NP sequence should be analyzed. Are such *wulun*-constituents still to be analyzed as having a clausal structure? This is not impossible, but one can not ignore an analysis on which a *wulun* + wh-NP sequence constitutes an NP filling an argument position of the predicate (at D-structure). In this section I will bring up some cases which will support the second analysis and then I will return to the first analysis, which as will be shown, is also needed.

Consider (8).

- (8) Zhangsan dui Lisi hen hao
 Zhangsan to Lisi very good
 ‘Zhangsan is kind to Lisi.’

The predicate *hao* ‘kind, good’ must select a PP as its internal argument (on the intended reading). Moreover, the PP cannot be moved to the beginning of the sentence, as shown below.

- (9)*Dui Lisi Zhangsan hen hao
 to Lisi Zhangsan very kind
 ‘Zhangsan is very kind to Lisi.’

Now consider (10).

3. Although I assume that a *wulun*-clause is an adverbial, I will not try to settle the syntactic category of *wulun* ‘no matter’. It might be a preposition or an adverb of some sort.

- (10) Zhangsan (wulun) dui shei dou hen hao
 Zhangsan no-matter to who all very good
 'Zhangsan is kind to anybody.'

(10) shows that *wulun* 'no matter' can be directly prefixed to the internal PP argument of the predicate *hao* 'kind'. Interestingly, just as the PP in (9) cannot be moved to the beginning of the sentence, the *wulun*-PP in (10) cannot be so moved. (11) is as ill-formed as (9).

- (11)*Wulun dui shei Zhangsan dou hen hao
 no-matter to who Zhangsan all very good
 'Zhangsan is kind to anybody.'

This indicates that the *wulun*-constituent *wulun dui shei* 'no matter to whom' in (10) cannot be analyzed as an adverbial clause. Instead, *wulun* in (10) seems to directly take the PP following it as its complement and the *wulun*+PP as a whole is the internal argument of the predicate *hao* 'kind'.

If *wulun* 'no matter' can take a PP to serve as the internal argument of a predicate, it is reasonable to assume that the same can apply to *wulun*+Wh-NP. That is, a *wulun*+Wh-NP sequence can function as a nominal argument of a predicate.

2.3 Ambiguous Cases

I have shown that *wulun* 'no matter' can be subcategorized for either a question-like CP or a wh-NP. If it takes a CP as its complement, the *wulun*-constituent is an adverbial clause modifying the main clause. If it takes a wh-NP as its complement, the *wulun*-constituent is a nominal filling an argument position of the predicate. However, there seem to exist *wulun*-constituents whose analysis might be ambiguous. Consider (12a) and (12b).

- (12) a. Wulun shei dou bixu zunshou falü
 no-matter who all must obey law
 'no matter who must obey the law.'
- b. Wulun shei ni dou bu neng qiao-bu-qi
 no-matter who you all not can look-meanly-of
 'You can't look meanly of no matter who.'

If *wulun*+wh-NP's can be analyzed as nominals filling an argument position of a predicate as we saw above, there is no reason to exclude such an analysis for (12a) and (12b). However, it seems also possible to analyze the *wulun*-

constituents in (12) as having a clausal structure. Consider (13a) and (13b), which minimally differ from (12a) and (12b) in having an additional pronoun. The examples in (13) suggests that the *wulun* + wh-NP's in (13a) and (13b) might have a clausal structure and the pronoun is anaphorically related to the wh-phrase inside the wh-clause.

- (13) a.? *Wulun shei ta dou bixu zunshou falü*
 no-matter who he all must obey law
 'No matter who it is, he must obey the law.'
- b.(?) *Wulun shei ni dou bu neng qiao-bu-qi ta*
 no-matter who you all not can look-meanly-of him
 'No matter who it is, you cannot look meanly of him.'

Two facts are relevant to the above suggestion. One is that the copular verb *shi* 'be' can be inserted to the *wulun*-constituents in (13a) and (13b), as is illustrated by (14). The second fact is that the copular verb *shi* 'be' is optional in many Chinese constructions. Two illustrative examples are given in (15).

- (14) a. [*Wulun shi shei*] [(*ta*) dou bixu zunshou falü]
 no-matter be who he all must obey law
 'No matter who it is, he must obey the law.'
- b. [*Wulun shi shei*] [*ni dou bu neng qiao-bu-qi (ta)*]
 no-matter be who you all not can look-meanly-of him
 'No matter who it is, you can't look meanly of him.'
- (15) a. *Ta (shi) Shanxi ren*
 he be Shanxi man
 'He comes from Shanxi province.'
- b. *Zhe-ben shu (shi) shei-de?*
 this-CL book be who-Gen
 Whose book is this?'

The above two facts, together with the fact that Chinese allows a null pronoun (Huang 1984), suggest that the *wulun*-constituents in (12) might involve a clausal structure which is obscured only because of the optionality of the copular verb *shi* 'be' and the possibility of null pronouns. Rather, the analysis in (16) is in principle possible for the examples in (12).

- (16) a. [*Wulun (shi) shei*] [*pro dou bixu zunshou falü*]
 no-matter be who all must obey law
 'No matter who it is, he must obey the law.'

- b. [Wulun (shi) shei] [ni dou bu neng qiao-bu-qi pro]
 no-matter be who you all not can look-meanly-of
 ‘No matter who it is, you can’t look meanly of him.’

I cannot find any evidence against this analysis.

In relation to the structure *wulun* + *shi* + *wh-NP*, it is interesting to mention Haspelmath’s (1995) diachronic study of free-choice indefinite determiners. He points out that a concessive conditional clause containing a copular verb and a *wh*-word as its predicate nominal may lose its sentential status and be integrated into the main clause. For example, he says that the Russian example (17a) is actually derived from the hypothetical proto-structure (17b), whereby the copular becomes the indefinite marker in (17a).

- (17) a. Sovetuju nažit’ den’gi kakim by to ni bylo obrazom
 I. advise to. earn money which: INSTR INDEF way: INSTR
 ‘I advise (you) to make money by any means.’
 b. Sovetuju năžit’ den’gi, kakim by obrazom to ni
 I. advise to. earn money which: INSTR PTCL way: INSTR it PTCL
 bylo
 be
 ‘I advise (you) to make money (by) whichever means it may be.’

It is very possible that Chinese nominal *wulun*-constituents are also historically derived from their sentential counterparts with the loss of the copular *shi* ‘be’ in the structure. This analysis might explain why some *wulun*-constituents seem to be ambiguous between a sentential and a nominal analysis as discussed previously. Very likely, the (possibly on-going) diachronic change is responsible for the marginality of examples like (13a) and (13b). (For other languages which use ‘no matter’ to indicate indefiniteness and free choice, see Haspelmath (1993) for discussions.)

2.4 Elliptical Nominal *wulun*-constituents

We have seen that the word *wulun* ‘no matter’ in sentential *wulun*-constituents is optional (e.g. (3)). Given this, it is not strange at all to suppose that the same morpheme is also optional in nominal *wulun*-constituents. When the word *wulun* ‘no matter’ does not surface in a nominal *wulun*-constituent, the result is a *wh... dou* construction such as (18a) and (18b).

- (18) a. (Wulun) shei dou bixu zunshou falü
 no matter who all must obey law
 'Anybody must obey the law.'
- b. (Wulun) shei wo dou bu xiangxin
 no matter who I all not believe
 'I do not believe anybody.'

I will refer to nominal *wulun*-constituents with implicit *wulun* 'no matter' as bare *wulun*-NP constituents. Bare *wulun*-NP constituents can only be analyzed as arguments of a predicate. One argument for this is that they appear where nominal arguments may appear but sentential *wulun*-constituents are not allowed to appear. Compare (19a) with (19b).

- (19) a. Women zheli (wulun) shenme shu dou you
 we here no matter what book all have
 'We have any kind of book here.'
- b. *Women zheli wulun shi shenme shu dou you
 we here no matter be what book all have
 'No matter what kind of book it is, we have it here.'

The ungrammaticality of (19b) indicates that it is impossible to analyze the bare *wulun*-NP in (19a) as a clausal adverbial *wulun*-constituent with both *wulun* 'no matter' and the copular verb *shi* 'be' being deleted.⁴

Another piece of evidence of treating bare nominal *wulun*-constituents as arguments of predicates comes from the fact that they do not support a pronoun, as is shown by the examples in (20).

- (20) a. *shei **ta** dou bixu zunshou falü
 who he all must obey law
 'No matter who it is, he may come.'
- b. ?*shei wo dou bu xiangxin **ta**
 who I all not believe him
 'No matter who it is, I do not believe him.'

The ungrammaticality of (20a) and (20b) follows if *shei* 'who' in (20a) is the sub-

4. Note that the contrast between (19a) and (19b) also provides an argument for the hypothesis that a *wulun*-NP can serve as an internal argument of a predicate as I suggested earlier.

ject of the sentence and *shei* 'who' in (20b) is the object which is raised.⁵

3. The Semantics of *Wulun*-constructions

In this section, I will provide a semantics for both sentential and nominal *wulun*-constructions.

3.1 The Semantics of Sentential *wulun*-constructions

Consider (21).

- (21) *Wulun ni yaoqing shei, wo dou huanying ta*
 no-matter you invite whom I all welcome him
 'No matter whom you invite, I will welcome him.'

From a pre-theoretic point of view, what (21) intuitively expresses is the following.

- (22) If you invite John, I will welcome him.
 If you invite Jack, I will welcome him.
 ”
 ”
 If you invite Mary, I will welcome her.

In other words, the *wulun*-clause in (21) denotes a set of propositions and the sentence says that whichever proposition in that set is taken to be true, the proposition expressed by the main clause is true. This intuition seems to imply that sentential *wulun*-constructions are much like *if*-conditionals except that the antecedent clause is a set of propositions rather than a single proposition. Hereafter I will refer to *wulun*-constructions such as (21) as *wulun*-conditionals.

There was once a time that conditionals had been taken to be material implications. The recent theory of semantics has shown that this is a mistake. In examining sentences like

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5. It is interesting to note that NPs with universal force cannot support a pronoun as is shown by (ia) and (ib).
 (i) a. *Every linguist, he is clever.
 b. *Every student, I like him.

Later I will show that bare nominal *wulun*-constituents have universal force due to *wulun* 'no matter'. If this is the case, then the ungrammaticality of (20a,b) might also be explained in the same terms.

(23) If a man owns a donkey, he always/usually/sometimes beats it.

Lewis (1975) convincingly argues that one cannot stick to the traditional view that *if* is a sentential connective. He argues that an *if*-clause serves to restrict the adverb. According to Lewis, *if* has no meaning apart from the adverb that it restricts. Building on Lewis' insight, Kratzer (1978, 1979, 1991) has argued for a uniform treatment of *if*-clauses as restricting the domains of various operators such as adverbs of quantification and modal operators. According to Kratzer (1978), Heim (1982) and Kadmon (1987), in *if*-conditionals, if no overt operator is found, an implicit operator equivalent to *always* or a necessity operator is assumed to be in the structure. In what follows, I will be only concerned with adverbs of quantification, but not modal operators. I will refer to adverbs of quantification as Q-ADVs.

What do Q-ADVs quantify over in conditionals and how do *if*-clauses supply the domains of Q-ADVs? There have been different answers to these questions. According to one story, Q-ADVs only quantify over minimal situations in which the restrictive clause is true (Berman 1987, Heim 1990, von Stechow 1994).⁶ On this analysis, Q-ADVs relate two sets of situations. The first set is supplied by the restrictive clause and the second set comes from the main clause. Take (24) for example. This sentence is analyzed as claiming that every minimal situation in which John is hungry can be extended to a situation in which he eats a hamburger.

(24) If John is hungry, he always eats a hamburger.

More formally, (24) is true in a situation *s* if and only if (25) holds.

(25) $\forall \min_s [s \in \llbracket \text{John is hungry} \rrbracket \rightarrow \exists s' (s \leq s' \ \& \ s' \in \llbracket \text{he eats a hamburger} \rrbracket)]$

In (25), *s*, *s'* are situations, \leq is the part-of relation between situations. "Minimal" is defined in terms of \leq . For any set of situations *S*, the set of minimal situations in *S*, $\min(S) = \{s \in S: \forall s' \in S (s' \leq s \rightarrow s' = s)\}$. We can generalize the above kind of interpretation to any adverbially quantified sentence of the form δ -if/when *p*-*q*; namely, a sentence of the form δ -if/when *p*-*q* is true in a situation *s* if and only if δ -many minimal *P*-situations are extendable to *q*-situations. The semantics of conditionals sketched above forms part of the basis of my following discussion of the semantics of *wulun*-conditionals.

6. Modal operators, on the other hand, might quantify over accessible (possible) worlds.

We have seen that what a *wulun*-conditional expresses is that if a proposition in the set of propositions denoted by the *wulun*-clause is true, then the proposition expressed by the main clause is true. Adopting the situation semantics of conditionals outlined above, this amounts to saying that a *wulun*-conditional is paraphrased as follows: Every minimal situation in which a proposition in the set of propositions corresponding to the denotation of the *wulun*-clause is true is extendable to a situation in which the proposition expressed by the main clause is true. If such a paraphrase truly represents the meaning of *wulun*-conditionals, the interpretation procedure for *wulun*-conditionals can be said to be basically parallel to that for an *if*-conditional except that we have to consider a set of propositions with respect to the restrictive clause in the former case rather than just one single proposition. In what follows, I will provide a semantics which will yield this result.

There are at least three things that need to be known in order to provide a semantics for *wulun*-conditionals. First, we need to know what the denotation of the wh-clause following *wulun* ‘no matter’ is. Second, we need to know what the denotation of the combination of *wulun* ‘no matter’ and its following wh-clause is. Finally, we also need to know what *dou* contributes in *wulun*-constructions.

Let me start with the denotation of the wh-clause following *wulun* ‘no matter’. It was shown earlier that the wh-clause following *wulun* ‘no matter’ is a kind of embedded question. There have been several proposals in the literature concerning what (embedded) questions denote. One proposal is made by Hamblin (1973), who treats (embedded) questions as denoting sets of propositions representing possible answers to the questions. On this analysis, a question such as (26a) denotes the set of propositions in (26b), i.e., the set of propositions {that a left, that b left, that c left, . . .} for each person a, b, c . . . in the universe.

(26) a. Who left?

b. $\lambda p \exists x [\text{person}'(x) \ \& \ p = \text{left}'(x)]$

Since I identify a proposition with those situations in which the proposition is true, a set of propositions is a set of sets of situations. Hamblin’s sets of propositions for questions provide a very good candidate for the denotation of wh-clauses selected by *wulun* ‘no matter’.

Next, what is the denotation of *wulun* ‘no matter’? I propose that the function of *wulun* ‘no matter’ is to form the generalized union over the set of propositions, i.e., the set of sets of situations, denoted by the wh-clause following it. The generalized union over a set of propositions is defined as follows.

(27) Let A be any set of propositions

$$\cup A = \{s: \exists p (p \in A) \ \& \ s \in p\}$$

Given (27), the denotation of a *wulun*-clause, say *wulun shei lai* ‘no matter who comes’ is (28).

(28) *Wulun shei lai*

$$= \{s: \exists p (p \in \{q: \exists x [\text{person}'(x) \ \& \ q = \text{came}'(x)]\}) \ \& \ s \in p\}$$

$$= \{s: \exists p \exists x [\text{person}'(x) \ \& \ p = \text{came}'(x) \ \& \ s \in p\}$$

What does *dou* contribute in *wulun*-constructions? Lee (1986), Liu (1990) and Lin (1996) have shown that *dou* is a distribution operator. In particular, Lin (1996) has argued that *dou* is a distribution operator across constructions. Granted that this is correct, what does *dou* distribute over in *wulun*-conditionals? I would like to suggest that it distributes over the set of situations in the union corresponding to the denotation of the *wulun*-clause. As I will show below, this analysis correctly yields the interpretation that we want for *wulun*-conditionals.

Armed with the above assumptions, let us now consider what the analysis of a *wulun*-conditional, say, (29), would look like.

(29) *Wulun pro zuo shenme shi, ta dou hen jinzhang*

no-matter do what thing he all very nervous

‘No matter what he does, he is nervous.’

The wh-clause in (29) denotes the set of propositions $\{p: \exists x [\text{thing}'(x) \ \& \ p = \text{does}'(\text{he}', x)]\}$. *Wulun* ‘no matter’ forms the generalized union over the denotation of the wh-clause, yielding the set of situations $\{s: \exists p \exists x [\text{thing}'(x) \ \& \ p = \text{does}'(\text{he}', x)]\} \ \& \ s \in p\}$. *Dou* is a distribution operator which distributes over the set of situations denoted by the *wulun*-clause. These results, coupled with the semantics of conditionals sketched previously, yield the following interpretation for (29): Every minimal situation in the set of situations $\{s: \exists p \exists x [\text{thing}'(x) \ \& \ p = \text{does}'(\text{he}', x)]\} \ \& \ s \in p\}$ is extendable to a situation in which he is nervous. This seems to be the intuitively correct interpretation of (29). To the extent that this is correct, the truth-conditions of *wulun*-conditionals can now be stated formally as follows.

(30) $[[\textit{wulun } \alpha \textit{ dou-}\beta]]$ is true in a situation *s* if and only if the following holds:

$$\forall \min_s [s \in \cup [\alpha] \rightarrow \exists s' [s \leq s' \ \& \ s' \in [\beta]]]$$

As the truth conditions in (30) indicates, the semantics of *wulun*-conditionals is

much like that of *if*-conditionals except that we have a set of propositions in the antecedent clause which is distributed over by *dou*.

I have so far shown how *wulun*-conditionals should be interpreted. Recall, however, that *wulun*-conditionals can be classified into three subtypes. In one type, neither the wh-clause selected by *wulun* ‘no matter’ nor the wh-phrase inside the wh-clause is related to an argument position in the main clause. (29) exemplifies this type. Since I have already explained how this type of sentence is interpreted, no further comment is needed here. In the other two types, either the wh-clause selected by *wulun* ‘no matter’ or the wh-phrase inside the wh-clause is related to a (possibly empty) anaphoric pronoun in the main clause. These two types of *wulun*-conditionals should be subject to the same interpretation procedure as the first type except that we have to further explain how the anaphoric relation arises. I briefly discuss this issue below.

Consider (31), where the pronoun *ta* is anaphorically related to the wh-phrase in the *wulun*-clause.

- (31) *Wulun ni yaoqing shei, wo dou huanying ta*
 no-matter you invite who I all welcome him
 ‘No matter whom you invite, I will welcome him.’

What type of pronoun is *ta* in (31)? Is it a bound variable? I think that this is dubious. Notice that in my above discussion of the denotation of embedded questions, following Karttunen (1977), I have assumed that wh-phrases in questions are interpreted as being existentially quantified. If this is correct, the pronoun *ta* ‘he’ in (31) cannot be bound by the wh-phrase, because the scope of the wh-phrase is restricted to the *wulun*-clause. Another possibility is to treat the pronoun *ta* in (31) as an E-type pronoun which is essentially a definite description (Cooper 1979, Evans, 1980, Heim 1990). Indeed, this is the analysis proposed by Cheng and Huang (1996). I refer readers to their arguments. As for the analysis of E-type pronouns, I follow Heim’s (1990) analysis, treating them as functor variables whose interpretations are only to pick out contextually salient entities of the appropriate type. For example, in the case of (31), the functor variable represented by the pronoun *ta* ‘he’ is a partial function which assigns to each situation in its domain the unique man that you invite in that situation. This would account for examples like (31).

As for the third type of *wulun*-conditionals, consider (6), repeated below.

- (6) *Wulun ta yaoqing shei, pro dou bu guan wo-de shi*
 no-matter he invite who all no matter my business

‘No matter whom he invites, it is none of my business.’

As discussed earlier, the empty *pro* subject in (6) is anaphoric to the *wh*-clause rather than to the *wh*-phrase inside the *wh*-clause. The anaphora seen in (6) is thus a type of sentential anaphora rather than nominal anaphora. I propose to accommodate such type of sentential anaphora under the E-type analysis of nominal anaphora. This only needs one minor revision of normal nominal E-type pronouns as proposed in Heim (1990). That is, in addition to being partial functions from situations to individuals, E-type pronouns can be partial functions from situations to situations.

After showing how *wulun*-conditionals are interpreted, I now turn to two semantic effects associated with such constructions. It seems appropriate to paraphrase the meaning of a *wulun*-conditional such as (32) as something like (33).

(32) *Wulun ni yao shenme, wo dou keyi mai gei ni*
 no-matter you want what I all can buy to you
 ‘No matter what you want, I can buy it for you.’

(33) ‘I can buy all/any thing(s) which you want for you.’

Notice that I use both *all* and *any* in (33) to paraphrase the *wulun*-constituent. This is because (32) is ambiguous between two readings. For the sake of illustration, let us suppose that you like ten things. Then one reading of (32) requires that I buy all the ten things which you like for you. However, (32) can also be true in a situation where only one of the ten things you like will be bought although it does not matter which one. The second reading is a free choice interpretation. The free choice interpretation is most easily available when the context is specifically restricted. For example, if (32) is followed by a sentence such as (34), then only the free choice interpretation is possible.

(34) *Buguo ni zhi neng xuan yi-yang*
 but you only can choose one
 ‘But you can only choose one.’

That a *wulun*-clause has a free choice interpretation is further supported by examples such as (35), which is not a contradiction.

(35) *Wulun ni yao na-yi-ge, wo dou keyi gei ni*
 no-matter you want which-one-CL I all can give you

keshi, wo bu neng ba mei-yi-ge dou gei ni
 but I not can BA every-one-CL all give you

'No matter which one you like, I can give it to you, but I cannot give every one of them to you.'

The two readings which we saw in (32) are quite similar to the ambiguity of (36a) discussed by Haspelmath (1995, 374). (36) can be felicitously used in a situation when there are hundreds of guests, but only one of them is actually allowed inside because of a specific restriction. (For earlier discussion of free choice *any*, see Vendler (1967).) However, if the context does not make such a restriction, (36a) can effectively convey the same as (36b).

(36) a. Any guest can come in.

b. Every guest can come in.

It is hard to pin down what mechanism makes *wulun* 'no matter' and the free choice *any* behave alike. Here I will only stipulate that the domain of *wulun* 'no matter' and free choice *any* can be contextually restricted in the manner discussed above, whereas *every* may not. Whatever accounts for the ability of *wulun* 'no matter' and free choice *any* to be specifically restricted should then account for the ambiguity of (32) and the difference between (36a) and (36b).

Wulun-conditionals also have an effect of "domain widening", a term borrowed from Kadmon and Landman (1993). Consider the following example.

(37) A: Nimen zheli you-mei-you xiaohaizi kan de shu?
 you here have-not-have children read REL book

'Do you have books for children to read here?'

B: *Wulun* ni yao shenme shu, women zheli dou you
 no-matter you want what book we here all have

'No matter what (kind of) book you want, we have it here.'

It is well-known that a context of utterance sets up a domain of quantification. So in (37), when A brings up the relevance of books for children to read, this kind of book should be the most salient entity. However, when B replies to A with a *wulun*-sentence, those kinds of books which are previously regarded as irrelevant by A now become relevant in the discourse. What we see in (37) is this: *wulun*-conditionals have an effect of widening the previously given domain of quantification. This kind of "domain-widening" effect has been discussed by Zaefferer (1987) and Hazout (1990) with respect to English *wh-ever* sentences. Zaefferer (1987) dubs this effect "opening the background". The effect of

“domain widening” associated with *wulun*-sentences, interestingly, is very similar to the “domain widening” effect associated with *any* discussed by Kadmon and Landman (1993). One example given by Kadmon and Landman is (38).

(38) A: Perhaps some dry socks would help?

B: ANY socks would help.

In (38), with the use of (stressed) *any*, B essentially says that socks would help and that wet socks are no exception. So the effect of *any* is to widen the domain of quantification.

Where should we attribute the effect of “domain widening” associated with *wulun*-conditionals? I think the widening effect can be derived from the analysis that I propose. Recall that I have assumed that the set of propositions denoted by a wh-question selected by *wulun* ‘no matter’ is the set from which possible answers to it can be constructed. Consequently, any possible entity of the relevant kind should be in the domain of a question. For example, if a question selected by *wulun* ‘no matter’ contains the wh-phrase *shenme shu* ‘what book’, then any possible (kind of) book can be used to construct a possible answer to the question, regardless of whether it is a book for adults or for children. Since *wulun* ‘no matter’ forms the union of the set of propositions denoted by a wh-clause, the set of all possible individuals corresponding to the wh-phrase in the wh-clause is in the domain of the question. I suggest that it is this property that explains why *wulun*-conditionals display the domain-widening effect. Take (37B). The domain of the wh-phrase *shenme shu* ‘what book’ consists of all possible books in the universe. Since all possible books are included in the domain of the question, this domain must be larger than the one set up by the previous sentence which includes only books for children. The widening effect is thus derived. On this view, the domain-widening effect of *wulun*-conditionals is nothing but a pragmatic epiphenomenon.

The domain widening effect of *any* can be explained along the same line. The domain of *any* ranges over cotemporal individuals as well as any possible individuals. I think that it is the similarity between the domain of *wulun* ‘no matter’ and that of *any* that makes both exhibit the domain widening effect.

3.2 The Semantics of Nominal *wulun*-constituents

The optimal hypothesis that one can take for words like *wulun* ‘no matter’ is that they have a uniform semantics regardless of the type of complement that is selected. Under this hypothesis, the semantic difference between nominal and

sentential *wulun*-constituents would lie solely in the semantics of the complement. This in turn means that we only need to know what the wh-phrase selected by *wulun* ‘no matter’ denotes in order to compute the semantics of a nominal *wulun*-constituent. Consider (39).

- (39) (Wulun) shei dou hen congming
 no-matter who all very bright
 ‘No matter who (=any person) is bright.’

In the last section, I proposed that *wulun* ‘no matter’ is a union formation operator taking a set of sets of objects to form the generalized union over that set. Thus, the wh-phrase *shei* ‘who’ in (39) should denote a set of sets of individuals. The most reasonable hypothesis, of course, is that the set of individuals is a set of sets of humans. In view of this, I assume that individuals are singleton sets. The meaning of *wulun shei* ‘no matter who’ is therefore (40b).

- (40) a. $[\textit{shei}] = \{\{a\}, \{b\}, \{c\} \dots\}$, where $\{a\}$, $\{b\}$, $\{c\}$, etc.,
 are individuals in the universe.
 b. $[\textit{wulun-shei}] = \cup [\textit{shei}] = \{x: \exists y \in [\textit{shei}] \& x \in y\} = \{a, b, c, \dots\}$

This result is very desirable. The generalized union over a set of sets of humans can be regarded as a plural entity. Consequently, it is distributable by *dou*. The interpretation of (39) is therefore (41), which intuitively captures the meaning of (39).

- (41) $\forall y [y \in \{x: \exists y \in [\textit{shei}] \& x \in y\} \rightarrow \textit{bright}'(y)]$

To make the discussion of nominal *wulun*-constituents complete, it should be pointed out that just like sentential *wulun*-constituents, nominal *wulun*-constituents have free choice interpretations as well as “domain widening” effects. The free choice interpretation of a nominal *wulun*-constituent can be illustrated by the dialogue in (42). The scenario of the dialogue in (42) is this. A customer is buying a fish from a fish stand. When the customer replies to the fish vendor’s question (42B) with (42A’), he does not mean to ask the fish vendor to give him all the fishes that he has. What he intends is that no matter which fish the fish vendor selects from among all the fishes, he will take that fish. Clearly, the customer is giving the fish vendor a freedom of choice to select any fish. In this context, the nominal *wulun*-constituent is in free variation with a free choice *renhe-NP* ‘any-NP’.

- (42) A: Qing ni gei wo yi-tiao yu, hao ma?
 please you give me one-CL fish alright Q
 'Would you please give me a fish?'
 B: Ni yao na-yi-tiao?
 you want which-one-CL
 'Which one do you want?'
 A': (Wulun) na-yi-tiao dou xing
 no matter which-one-CL all fine
 'Any fish will do.'

The fact that (43) is not a contradiction also supports the claim that a nominal *wulun*-constituent can be used as a free choice NP.

- (43)(Wulun) na-yi-tiao yu, wo dou keyi song ni,
 no-matter which-one-CL fish I all may give you
 keshi wo bu neng ba mei-yi-tiao dou song ni
 but I not can BA every-one-CL all give you
 'I can give you no matter which fish (= any fish), but I cannot give you every fish.'

The domain widening effect of nominal *wulun*-constituents can be illustrated by (44).

- (44) A: Nimen zheli you-mei-you xiaohaizi kan de shu?
 you here have-not-have children read REL book
 'Do you have books for children to read here?'
 B: Women zheli (wulun) shenme shu dou you
 we here no-matter what book all have
 'We have no matter what kind of book (= any kind of book) here.'

(44) only minimally differs from (37). So no further comments are needed.

I think that it is not a surprise to find that nominal *wulun*-constituents exhibit the same phenomena as sentential *wulun*-constituents. The widening effects of nominal *wulun*-constituents are easy to explain so long as we make the assumption that wh-phrases selected by *wulun* 'no matter' denote sets of possible individuals. On the other hand, whatever accounts for why sentential *wulun*-constituents may obtain a free choice interpretation should be carried over to nominal *wulun*-constituents, namely, the domain of *wulun* 'no matter' can be specifically restricted.

It should be emphasized that what I have said of nominal *wulun*-constituents with overt *wulun* 'no matter' is also true of bare nominal *wulun*-constituents without overt *wulun* 'no matter'. This indicates that *wh... dou* constructions are indeed elliptical *wulun*-constructions.

Before turning to next section, there are two more remarks on nominal *wulun*-constituents which are worthy of note. First, it is interesting to point out that the *wh*-phrase in *wh... dou* constructions does not appear in extensional contexts. Thus, the following sentences are ill-formed.

- (45) a. *Shei dou zai chang ge
 who all PROG sing song
 'Anyone is singing.'
- b. *Shei dou zai na-ge fangjian-li
 who all PROG that-CL room-inside
 'Anyone is in that room.'
- c. *Shei dou yijing likai-le
 who all already leave-Asp
 'Anyone already left.'

This distribution is similar to *any* in English. The following sentences from Carlson (1981) are all ill-formed.

- (46) a. *Anyone is in that room.
 b. *Bob is sitting in any chair.
 c. *Anyone just ran past our house.

The ungrammaticality of the examples in (45) possibly can be explained as follows under my analysis: The *wh*-phrases selected by *wulun* 'no matter' must denote possible individuals, but the *wh*-phrases in (45) denote actual individuals.

Second, Cheng (1991) has observed that (47) only has the (a) reading but not the (b) and (c) readings.

- (47) Shei shenme dou chi
 who what all eat
- a. 'Who eats everything?'
- b. *'Everyone eats everything.'
- c. *'What does everyone eat?'

Interestingly, the acceptable and unacceptable readings of (47) pattern with the following examples.

- (48) a. (Ni shuo) shei wulun shenme dou chi
 you say who no-matter what all eat
 'Who (did you say) eat everything/anything?'
- b. *Wulun shei wulun shenme dou chi
 no matter who no-matter what all eat
 'Everyone/anyone eats everything/anything'
- c. *Wulun shei shenme dou chi
 no matter who what all eat
 'What does everyone eat?'

The parallelism between (47) and (48) lends further support to the hypothesis that wh... dou constructions are related to *wulun*-constructions as I propose.

The next question is why (48b) and (48c) are ungrammatical. One possible conjecture for the ungrammaticality of (48b) is this: Each *wulun*-NP must be paired with *dou* but each clause can only contain one *dou* for some reason. The reason why *dou* must appear is still a mystery which does not have a good answer (See Lin (1996) for discussions of this issue). I only note that the same issue arises with universal quantifiers such as *mei-ge ren* 'everyone', which also require company of *dou* in order for the sentence to be well-formed.

As for the unacceptability of (48c), I think it is somehow related to the fact that interrogative object wh-phrases usually cannot be scrambled/moved to a position to the right of the subject. Thus (49b) is as ill-formed as (48c).

- (49) a. Ni xihuan chi shenme
 you like eat what
 'What do you like to eat?'
- b. *Ni shenme xihuan chi
 you what like eat
 'What do you like to eat?'

4. Comparisons with Lee (1986) and Cheng (1991, 1995)

In this section, I will summarize Lee's (1986) and Cheng's (1991, 1995) analyses of wh... dou constructions, comment on them and make some comparisons between their analyses and mine.

4.1 Summaries of Lee (1986) and Cheng (1991, 1995)

Lee's (1986) analysis of *wh... dou* constructions can be best summarized by the following quote:

. . . wh-word . . . under the effect of *dou* turns into an indefinite pronoun, which can be seen as an open variable bound by *dou*, yielding naturally the universal quantifier reading. (Lee 1986, 42)

This analysis has made two assumptions. One assumption is that wh-phrases are variables and the other is that *dou* in *wh... dou* constructions is a universal quantifier. Lee argues that the first assumption can be supported by the fact that wh-phrases in other contexts may behave as an indefinite pronoun as in (50).

- (50) Wo xiang chi dian shenme
 I want eat CL what
 'I want to eat something.'

As for the second assumption, he does not provide any argument for it. He assumes that *dou* in *wh... dou* constructions is the same *dou* as we find in the sentence *mei-ge ren dou you che* 'Everyone has a car.' (Lee 1986, 43).

Cheng's (1991, 1995) analysis of *wh... dou* constructions is essentially the same as Lee's except that she makes more assumptions. Her assumptions are:

(A) Chinese wh-phrases are free variables lacking inherent quantificational force just like indefinites in the sense of Heim (1982).

(B) Chinese wh-phrases are also polarity items which need to be licensed by a licensor m-commanding it at S-structure.

(C) *Dou* is both a polarity licensor and a binder.

Cheng's analysis of *wh... dou* constructions also has a close connection to Heim, Lasnik and May's (1991) treatment of English *each* in reciprocal sentences. To account for properties of English reciprocal sentences, Heim, Lasnik and May (HLM) suggest that *each* in *each other* is a marker of distribution. This distributor is adjoined at LF to its antecedent phrase. Thus (51a) has the LF representation (51b).⁷

7. On Heim, Lasnik and May's analysis, after *each* is removed from *each other*, the residue [e *other*] needs to undergo quantifier raising. This need not concern us here.

(51) a. The men saw each other.

b. [_S [_{NP} [_{NP} the men₁] each₂] [_{VP} saw [_{NP} e₂ other]₃]]

According to them, *each* is semantically a universal quantificational operator whose range is the atomic parts of the referent of the phrase to which it applies. Taking HLM's analysis of English *each* as a point of departure, Cheng proposes to treat *dou* in the same manner as HLM analyzes English *each*. Thus, *dou* is adjoined to the NP associated with it at LF. According to her, this analysis applies not only to plural NPs but also to wh-phrases with a difference that in the former case *dou* is an adverbial distributor, whereas in the latter it is an adverb of quantification equivalent to a universal quantifier. In addition, *dou* is taken to be an unselective binder which may simultaneously bind variables supplied by more than one wh-phrase. Her motivation of this has to do with examples like (52).

(52) Shei zuo shenme dou gen wo wuguan

who do what all with me no-relation.

'For all x, y, that x does y has no relation with me.'

In (52), it seems that both wh-phrases have a universal interpretation. Cheng points out that if *dou* has to be adjoined to the NP associated with it at LF, (52) would be a problem, because it is impossible for *dou* to be adjoined to two NPs. To resolve this problem, she suggests that *dou* in (52) is adjoined, at LF, to *shei zuo shenme* 'who does what' as a whole. Since the adjoined position m-ommands both wh-phrases, *dou* can license them and unselectively bind them, accounting for the universal force of both wh-phrases.

4.2 Comments and Comparisons

Lee's (1986) assumption that *dou* is a universal quantifier is based on the fact that *dou* occurs with the universal quantifier word *mei* 'every'. However, the fact that *dou* occurs with *mei* 'every' can by no means establish that *dou* is a universal quantifier. First of all, it is impossible to translate both *mei* 'every' and *dou* 'all' as a universal quantifier in logical form. Second, *dou* actually occurs with a variety of quantifier words such as *dabufen-de* 'most', *henduo* 'many', etc. When *dou* occurs with a quantifier word such as *dabufen-de* 'most', it is certainly not a universal quantifier, though it can be analyzed as a distribution operator as I have suggested (See Lin (1996)). It should be clarified that I distinguish a universal quantifier from a distribution operator, though both induce universal quantification. The distinction can be best shown by considering an open for-

mula. Suppose that we have an open formula of the form $F(x)$ with x a free variable. Then given a universal quantifier α , α can be prefixed to the open formula, quantifying over the variable x , turning the formula to $\forall xF(x)$. However, if α is a distribution operator, it cannot be prefixed to the open formula $F(x)$. Instead, it must relate a property P to a plural referent, distributing the property P over every atomic part of that plural referent. Clearly, the semantics of a universal quantifier is different from that of a distribution operator.

As for Cheng's (1995) assumption that *dou* has a dual status between an adverb of quantification and an adverbial distributor, there are two worries about this claim. First, it is not clear that *dou* must be ambiguous between an adverb of quantification and a distributor. As discussed in detail by Lin (1996), there is independent evidence of treating *dou* as a distributor. If this very same analysis can deal with *wh... dou* construction as well, why don't we adopt a univocal analysis of *dou*, treating it uniformly as a distribution operator across constructions? Second, *dou* does not really behave as an adverb of quantification. Consider the examples in (53).

- (53) Yi-ge erci fangchengshi tongchang/youshihou/zongshi you liang-ge
 one quadratic equation usually/sometimes/always have two
 butong-de jie
 different solutions
 alignment

'A quadratic equation usually/sometimes/always has two different solutions.'

Lewis (1975) has pointed out that in examples like (53) the adverb of quantification cannot quantify over times or events, because it does not make sense to say that a quadratic equation sometimes has two different solutions and sometimes does not. Thus the adverbs of quantification in (53) should quantify over the variable (case) supplied by the indefinite NP (see also Kamp (1981) and Heim (1982)). So (53) means that most/some/all quadratic equations have two different solutions. Now consider (54), where the adverbs of quantification in (53) is replaced by *dou*.

- (54)*Yi-ge erci fangchengshi dou you liang-ge butong-de jie
 one quadratic equation all have two different solution
 'All quadratic equations have two different solutions.'

In contrast to (53), the indefinite NP *yi-ge erci fangchengshi* 'a quadratic equation'

in (54) does not have universal force. Actually, (54) is ungrammatical. If *dou* is an adverb of quantification equivalent to a universal quantifier in force which can bind free variables introduced by indefinites, it is a puzzle why it cannot quantify over the variables supplied by the indefinites in (54), giving rise to a universal interpretation.⁸ However, the ungrammaticality of (54) has an easy explanation on the assumption that *dou* is a pure distributor. As a distributor, it distributes the property denoted by the predicate over the subject NP in (54). But this is impossible, because the subject NP denotes a singular individual which is not distributable.

After showing that the assumption that *dou* is an adverbial universal quantifier is questionable, I now would like to compare Lee-Cheng's approach with my approach to *wh... dou* constructions. I will refer to the first approach as the UQ (abbreviation of universal quantifier) analysis and the second approach as the elliptical *wulun* analysis.

To begin with, the elliptical *wulun* analysis captures the semantic parallels between *wh... dou* constructions and *wulun*-constructions, for example, the free choice interpretations and the domain widening effects, whereas the UQ analysis does not provide a straightforward explanation of these parallels.

Second, the elliptical *wulun* analysis also accounts for another syntactic parallelism between *wh... dou* constructions and *wulun*-constructions. It has been observed that the *wh*-phrase in *wh... dou* constructions may occur with *ye* 'also', especially when the sentence is negative (Yu 1965, Lü 1980, Lu 1986, Zhu 1982, Ma 1982, among others). Some examples are:

- (55) a. Ta shenme dou/ye bu chi
 he what all/also not eat
 'He does not want to eat anything.'
- b. Shenme kunnan dou/ye neng kefu
 what difficulty all/also can overcome
 'We can overcome any difficulty.'

The alternation between *dou* and *ye* is also found in constructions with a nominal and sentential *wulun*-constituent. This is illustrated by (56) and (57).

8. Notice that one cannot explain this away in terms of a plurality requirement. The plurality requirement is a condition on the theory of distribution, not one on the theory of quantification.

- (56) Wulun shenme kunnan dou/ye neng kefu
 no matter what difficulty all/also can overcome
 'We can overcome any difficulty.'
- (57) Wulun kunnan you duo da, dou/ye xia-bu-dao tamen
 no matter difficulty have how big all/also frighten them
 'No matter how big the difficulty is, it will not frighten them.'

Although it is beyond the scope of this paper to discuss the semantic effects of *ye* 'also' and a proper analysis of it, the *dou/ye* alternation lends a further argument that *wh...* *dou* constructions are related to *wulun*-constructions, as I propose. In contrast, the UQ analysis does not explain the *dou/ye* alternation.

Third, the elliptical *wulun* analysis explains, without making any additional assumption, why *dou* seems able to be associated with more than one *wh*-phrase in certain constructions as in Cheng's example (52), reproduced as (58).

- (58) Shei zuo shenme dou gen wo wuguan
 who do what all with me no-relation.
 'For every x, x a man, every y, y a thing, that x does y has no relation with me.'

As noted, in order to account for (58), Cheng has proposed to treat *dou* as an unselective binder. This approach is dubious. I believe that (58) is only an instance of elliptical sentential *wulun*-constructions. Notice that one can prefix *wulun* 'no matter' or *buguan* 'no matter' to (58) without affecting the meaning of the sentence, as is shown by (59).

- (59) Wulun/buguan shei zuo shenme dou gen wo wuguan
 no-matter who do what all with me no-relation.
 'No matter who does what, it has no relation with me.'

This indicates that the constituent *shei zuo shenme* 'who do what' in (58) is nothing but an embedded question. As we know, interrogation allows multiple *wh*-phases as illustrated by (60).

- (60) Shei mai-le shenme?
 who buy-ASP what
 'Who bought what?'

So it is only natural to find multiple *wh*-phrases in sentential *wulun*-constituents as in (58) or (59). What licenses the two *wh*-phrases in (58) is the semantics of

interrogation. It is not because *dou* is an unselective binder and a polarity licenser that we find two wh-phrases in (58). Constructions like (58) and (59) are simply the same type of construction as (6) discussed previously. The only difference between (6) and (58) is that while only one wh-phrase appears in the embedded question in the former, two wh-phrases appear in the embedded question in the latter. Apart from this difference, the semantics of (58) would be like that of (6).

Fourthly, Cheng's theory of polarity licensing runs into another problem with respect to examples like (61). As mentioned, she claims that Chinese wh-phrases are polarity items that need to be licensed and that *dou* is a polarity licenser. Unfortunately, she does not tell the readers what counts as a polarity licenser. This issue is important, however. Without a precise definition of polarity licensers, it is not clear what syntactic or semantic property makes *dou* a polarity licenser. On Cheng's approach to *wh... dou* constructions, it is also a puzzle why *ge* 'each' cannot adjoin to the wh-phrase at LF and bind the variable supplied by the wh-phrase in exactly the same way as *dou* does.

- (61)*Shei ge mai-le yi-ben shu
 who each buy-ASP one-CL book
 'For all x, x a person, x bought a book.'

The elliptical *wulun* analysis, in contrast, does not have the above problem. On this analysis, the wh-phrase in *wh... dou* constructions is not a polarity item at all. So it does not need to be licensed by any polarity licenser. Also, since *ge* 'each' does not appear in the non-elliptical *wulun*-constructions to begin with, there is no reason to expect it to appear in the elliptical counterparts.

Finally, it is not clear how the UQ analysis may account for the fact that the wh-phrase in *wh... dou* constructions does not appear in extensional contexts. The elliptical *wulun* analysis fares better in this aspect. Under the elliptical *wulun* analysis, the wh-phrase in *wh... dou* constructions is selected by (the possibly null) *wulun* 'no matter'. Thus, quantification is over possible individuals, not actual individuals.

4.3 Conclusions

I have argued that *wh... dou* constructions are elliptical *wulun*-constructions and provided an explicit semantics for them. If correct, my analysis will eliminate the need of treating *dou* as ambiguous between an adverb of quantification and a distributor as Lee (1986) and Cheng (1991, 1995) have suggested.

Acknowledgements

Research of this paper is supported by a grant from Chiang Ching-kuo Foundation. I have benefitted a lot from discussions with Chisato Kitagawa, Anglike Kratzer, Irene Heim, Kyle Johnson and Barbara Partee. I am also very grateful to two reviewers' valuable comments and suggestions.

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(編輯部按：本文實際出版日期為 1998 年 3 月。)

試論 Wh... 都句型

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摘 要

本文討論國語中的 Wh... Dou 結構的句法及語意。我主張把 Wh... Dou 結構視爲一種省略了「無論」的句型並舉例證明「無論」不僅可帶問句而且可帶 Wh-名詞組當補語。在語意上，「無論」被視爲一個聯集運符，把它的補語的語意值形成一個聯集。「都」的功能則是對聯集中的各個成員做分配。這樣的分析不僅在語料的處理上比前人的分析如李行德（1986）及鄭禮珊（1991, 1995）要來得完美，在理論上也更爲簡潔精巧。

關鍵詞：Wh... dou 句型，無論，分配運符