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DOU: DISTRIBUTIVITY AND BEYOND

by

LIPING CHEN

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## ABSTRACT OF THE DISSERTATION

### **Dou: Distributivity and Beyond**

By LIPING CHEN

Dissertation director:

Veneeta Dayal

This dissertation investigates the semantic properties of the particle *dou* in Chinese. The standard view of it is that it is a particle that accompanies plural noun phrases and has a semantics somewhat similar (not identical) to the floated *all* in English. In this dissertation, I will explore in some depth several phenomena where *dou* seems to play a role that goes beyond distributivity.

Chapter 1 introduces the standard view of *dou* as a distributive operator as proposed in Lin (1998) and the topics of the thesis. In so doing, the similarities and differences between *dou* and English *all* are highlighted.

Chapters 2 and 3 are devoted to two topics that are not covered in Lin's original work and that seem to pose problems for his analysis. Chapter 2 discusses what I call the *dou*-(dis)harmony phenomenon: *dou*'s (in)compatibility with quantifier phrases. This challenges the standard semantics of *dou* in that all of the quantifier noun phrases, *dou*-compatible or not, are presumably plural and thus should be compatible with *dou*. In this chapter, I first argue that previous approaches that characterize the (dis)harmony effect in terms of categories of NPs are not correct. Then I claim that this has to do with a presupposition that accompanies *dou*. In

particular, I argue that *dou* has a presupposition about expectations and I propose to build this aspect of meaning into the semantics of *dou*. Chapter 3 investigates *dou* in a structure where plurality is not needed to license *dou*. Instead, focus is the crucial licensing factor. This is traditionally assumed to involve the *lian...dou/ye* ‘dou/also’ structure where it has a scalar reading similar to the meaning *even* has in English. Researchers disagree as to whether this *dou* should be assimilated to distributive *dou* or should be treated separately. Through careful investigations into some rarely addressed properties of *dou* in this structure, I conclude in favor of the ambiguity view of *dou*. In addition, I propose to link this *dou* to distributive *dou* through context sensitivity as I developed in chapter 2. Finally, I provide a compositional semantics for *lian...dou/ye* based on the semantics of each individual particle.

Chapter 4 extends the discussion to *dou* in free choice structures: *dou* co-occurring with *renhe*-NPs ‘any’ or *wh*-NPs yields a FC reading, similar to the corresponding English sentences with FC *any*. In this chapter, I explore the two FC structures from the perspective of English FC *any* and *whatever* on the one hand and from that of our prior discussions of *dou* on the other. We argue that *renhe...dou* is like universal *any* but *wh...dou* is neither like universal *any* nor definite *whatever*. It is suggested that *dou* in the two FC structures, *renhe...dou* and *wh...dou*, is related to distributive *dou* and scalar *dou* respectively, in support of our claim that there are two related but distinct *dou*’s.

Chapter 5 closes this thesis and provides some initial exploration of the interactions between *dou* and bare NPs. Chinese bare NPs are, basically, like English

bare plurals displaying various readings in various contexts. This chapter examines the behavior of bare NPs in various contexts from the perspective of the two-*dou* account developed in this dissertation. This investigation, though preliminary, provides further support for our claim that *dou* has a presupposition about the prior expectations on the part of the speaker and that the two *dou*'s need to be separated.

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## CHAPTER 1

### THE SEMANTICS OF DOU

#### 1.0 Introduction

*Dou* is a widely used particle in Mandarin Chinese. Its wide and peculiar distribution has made it an enduring topic, always occupying an important place in the study of Chinese linguistics. Syntactically, it has been extensively studied in both traditional Chinese grammars and in recent linguistic literature. Traditional grammarians take *dou* as an adverb, an insight picked up and developed by Lee (1986) and Cheng (1995) who treat *dou* as an adverb of quantification. Chiu (1990, 1993) argues that it is a floating quantifier, following the analysis of Sportiche (1988) for *tous* ‘all’ in French. Shyu (1995), Lin (1996), Li (1997), and Wu (1999) propose that *dou* is the head of a functional projection. Lin (1996, 1998) provides the first extensive treatment of the semantics of *dou*, treating it as a distributive operator parallel to English floated *all*, an account that we take as the starting point for our own discussion of *dou*.<sup>1</sup>

In this thesis, I will start from Lin’s analysis of *dou* and explore in depth some phenomena that are not covered in Lin’s original study and where *dou* seems to play a role that goes beyond its distributivity. In particular, I will examine the following three phenomena in three core chapters: the (dis)harmony effect *dou* shows with quantifier

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<sup>1</sup> Other theories on *dou* are introduced when relevant to our discussions.

phrases, *dou* in focus structure, and *dou* in free choice structures. In addition, we will talk briefly about the issue of *dou* in the context of bare NPs. By examining a span of *dou*-hosting contexts, from the more familiar domains to the less familiar ones, in the subsequent chapters, this thesis hopes to bring out a clearer and better understanding of the semantics of the particle in the language and at the same time, to contribute cross-linguistic insights to relevant issues in natural language semantics.

In the rest of this chapter, I will introduce Lin's (1998) semantic account of *dou* in some detail and show how this analysis is challenged by a series of topics to be addressed in this thesis. Section 1.1 provides the basic facts motivating Lin's analysis of *dou*, which treats it as parallel to English *all*. Section 1.2 presents the difference between *dou* and *all* and Lin's solution for capturing that difference. Section 1.3 introduces the phenomena that seem to challenge Lin's analysis.

### 1.1 The parallelism between Chinese *dou* and English *all*

*Dou* is similar to *all*, a fact that shows up clearly in the context of definite plurals.

For example, both sentences with *all* and *dou* in (1) have the interpretation in (2):

(1) a. The students all went to the gym. (from Brisson 1998)

b. Zhexie xuesheng dou qu jianshenfang le

these student dou go gym ASP

'These students all went to the gym'

(2) Every student went to the gym.

The floated *all*,<sup>2</sup> according to Link (1987), can be treated as a distributive operator operating on the VP, as in (3). By taking *all* as the D operator, the distributive reading of (1a) can be derived as in (4), where this operator takes a VP property and predicates it of individual members of the entity denoted by the NP.<sup>3</sup>

(3)  $D =_{df} \lambda P \lambda x \forall y [y \in x \rightarrow P(y)]$ , where  $x$  is a variable over plural individuals and  $y$  a variable over singular atomic individuals.

- (4) a.  $D \implies \lambda P \lambda x \forall y [y \in x \rightarrow P(y)]$   
 b.  $DVP \implies \lambda x \forall y [y \in x \rightarrow \text{go to the gym}'(y)]$   
 c.  $NP^DVP \implies \forall y [y \in [\text{the students}]] \rightarrow \text{go to the gym}'(y)]$

However, examples such as (5) have not only the distributive reading but also the collective reading even when *all* is used. That is, in this context, *the N + all* is like *the N* but not like *every N* (See Brisson 1998 and references cited there for a fuller discussion).

- (5) The kids (all) drew a picture.  
 (i) Each of the kids drew a picture -distributive reading

---

<sup>2</sup> *All* in (1) is often called the floated *all* as it is assumed to float from its prenominal position as indicated in (i). But *dou* doesn't seem to involve floating. As shown in (ii), *dou* doesn't appear in the prenominal position.

- (i) All the students went to the gym.  
 (ii) \*Dou zhexie xuesheng qu jianshenfang le  
 dou these student go gym ASP  
 Intended 'All the students went to the gym.'

<sup>3</sup> The distributive operator was originally proposed to deal with distributivity on predicates that are not lexically distributive such as (5). The sentence without *all* is ambiguous between the distributive reading and the collective reading, which are derived by application and non-application of the D operator respectively.



quantifier phrases but *all* in English never does.

(8) a. Dabufen yinger \* (dou) zhang de hen xiang

Most baby dou grow DE very alike

‘Most babies look a lot alike.’

b. Most babies (\*all) look alike.

(9) a. Meige haizi \*(dou) hua le yifu hua

Every-CL child dou draw ASP one-CL picture

‘Every kid drew a picture.’

b. Every kid (\*all) drew a picture.

These examples pose two problems for the analysis of *dou* outlined above. First, if *dou* distributes over each member of the plural individuals, it is problematic to extend it to examples such as (8), because direct application of atomic distribution will yield an interpretation that doesn’t make any sense: each individual baby looks alike. Second, if *dou*, like *all*, is distributive, it is puzzling why Chinese quantifiers need *dou* but English quantifiers don’t allow *all* in the same contexts.

To avoid the problem of atomic distribution in the contexts of predicates such as *look-alike*, Lin modifies *dou* as a generalized D-operator in the sense of Schwarzschild (1991, 1996). And to deal with the co-occurrence problem between *dou* and quantifiers, Lin (1998) suggests that Chinese quantifiers are like plural definites. They denote individuals, thus they can go with *dou* just as *all* can go with plural definites in English. The reason why English quantifiers don’t need *all* is that they are usually assumed to be

inherently distributive, thus they do not make available any plural individual for *all* to be associated with. Below I introduce in some detail Lin's analysis of *dou* and Chinese quantifiers.

### 1.2.1 Dou as a Generalized D-Operator

Schwarzschild (1994,1996) discusses examples like (10) that are neither strictly distributive nor strictly collective:

(10) The vegetables are too heavy for the gray scale and too light for the black scale.

Assume that the gray scale is for measuring light objects while the black scale is for measuring heavy objects. Assume also that the vegetables are kept in baskets that fall somewhere in the middle in terms of their weight. In such a situation, (10) will be judged true. However, the vegetables distributively are not too heavy for the gray scale and the vegetables collectively are not too heavy for the black scale. That is, (10) can be true only if the vegetables are interpreted distributively down to baskets.

To account for this sort of intermediate reading, Schwarzschild proposes the idea of a generalized D operator. This is done by putting a context-sensitive free variable *Cov* in the translation of the D-operator, as in (11)<sup>5</sup>.

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<sup>5</sup> I refer the reader to Schwarzschild for a thorough discussion of the foundational issues related to this topic.

(11) a.  $\llbracket D \rrbracket = \lambda P \lambda x \forall y [y \in \llbracket Cov \rrbracket \ \& \ y \subseteq x \rightarrow P(y)]$

b. C is a cover of P iff

(i) C is a set of subsets of P

(ii) Every member of P belongs to some set in C

(iii)  $\emptyset$  is not in C

c.  $x \in \llbracket {}^D (Cov) (P) \rrbracket$  iff

$\llbracket Cov \rrbracket$  is a cover of x and  $\forall y [y \in \llbracket Cov \rrbracket \rightarrow y \in \llbracket P \rrbracket]$

(11b) says that a *Cov* is a set of subsets of the plural argument such that the union of the subsets is identical to the plural argument. (11c) says that a sentence with a plural x is true just in case there is a cover C of that argument such that the predicate is true for every element y in C. Now, the level at which distributivity applies depends on what value the cover has in a given context. If *Cov* picks out baskets of vegetables, we will get the result we want. If there are three baskets, A, B and C, universal quantification over the cover will say that each basket of vegetables is too heavy for the gray scale & too light for the black scale.

Introducing the notion of covers, we have seen, takes care of intermediate readings. But then we may wonder how the old distributive/collective interpretations are handled in this approach. Schwarzschild claims that both distributivity and collectivity should be viewed as instantiations of generalized distributivity, the difference arising from the type of cover the D operator applies to in a given context. In particular, quantification of the D operator over a cover that contains all and only the atomic



individuals yields the distributive reading and quantification of the D operator over a cover that contains all individuals as a group yields the collective reading. This is illustrated below:

(12) a. The kids all drew a picture.

b.  $NP \stackrel{D}{VP} \implies \forall y [y \in \parallel Cov \parallel \& y \subseteq [[\text{the kids}]] \rightarrow \text{draw a picture}'(y)]$

Now, let us assume a situation with three kids, a, b and c. Two possible covers for the plural argument are the following:

(13) Cover-1 =  $\{\{a\}, \{b\}, \{c\}\}$

Cover-2 =  $\{\{a, b, c\}\}$

Then assigning the value of Cover-1 for the variable *Cov* will yield the distributive interpretation and assigning the value of Cover-2 for the variable *Cov* will yield the collective interpretation.

This differs from Link's approach in that the distributive and collective ambiguity under Link's approach is replaced by a general mechanism of distributivity. All of the various readings involving a plural argument come from the application of the D operator. That is, the D operator is always at work. It is the difference of covers the operator works on that determines the difference in readings.

Turning to Chinese. Lin assumes that the atomic distribution problem in examples like (8) can be avoided if *dou* is taken to be a generalized D-operator:

(14)  $dou = \lambda P \lambda X \forall y [y \in \parallel Cov \parallel \& y \subseteq X \rightarrow P(y)]$

This is because the distribution now can target the right partitions of the plural argument

as demonstrated above.<sup>6</sup> Below we show how the use of covers applies to statements with *dou* and quantifiers using *dabufen* ‘most’ and *mei* ‘every’ as illustrations.

### 1.2.2 The co-occurrence of *dou* with quantifiers

We look first at the co-occurrence of *dou* and *dabufen* ‘most’. Lin proposes that *dabufen* has the definition in (15) following Yabushita (1989).

$$(15) \quad \textit{dabufen} \textit{ 'most'} = \lambda P \lambda Q \exists Z \exists X [P(X) \ \& \ \forall Y (P(Y) \rightarrow Y \subseteq X) \ \& \ Z \subseteq X \ \& \ Q(Z) \ \& \ |Z| > |X| - |Z|], \text{ where } P \text{ and } Q \text{ represent the noun phrase and verb phrase respectively}$$

In (15), *X* refers to the set of individuals who have property *P* (the common noun property) and *Z* to the subset of *X* that has property *Q* (the VP property). The sentence is true iff *Z* is larger than the subset of *X* that doesn’t have property *Q*.

With this, we get the following interpretation for (8):

---

<sup>6</sup> However, adopting this approach will predict wrongly that (12) with *dou* may have a collective reading as well. This may be solved by Lin’s Proper Subset Condition on the use of *dou*:

- (i) *Dou* only occurs with predicates which have a proper subset entailment on the group argument.

In the case of (12), if four kids drew a picture, it doesn’t follow that two or three kids also drew a picture. Thus the predicate in (12) can’t be true of the group argument as a whole. In contrast, Lin discusses examples like (ii) where a collective reading is possible with *dou*. In (ii), if four people use the same kitchen together, it is also the case that three or two of the four people use the same kitchen. See also footnote 7.

- (ii) Suoyou-de ren    dou    he-yong                    yige    chufang  
       all            man    dou    together-use            one-CL    kitchen  
       ‘All people use one kitchen together.’

- (16) a.  $VP \Rightarrow \lambda x \text{ 'look alike'}(x)$   
 b.  $dou \ VP \Rightarrow \lambda X \forall y [y \in \parallel Cov \parallel \ \& \ y \subseteq X \rightarrow \text{look-alike}'(y)]$   
 c.  $most\text{-}NP \ dou \ VP \Rightarrow \exists Z \exists X [BABY'(X) \ \& \ \forall Y (BABY'(Y) \rightarrow Y \subseteq X) \ \& \ Z \subseteq X \ \& \ \forall y [y \in \parallel Cov \parallel \ \& \ y \subseteq Z \rightarrow \text{look-alike}'(y)] \ \& \ |Z| > |X| - |Z|]$

Since  $Z$  is a variable over plural individuals, we can form a plurality cover for it that consists of all plural individuals as its members. As a result, the property of looking alike can be distributed over each member in the plurality cover that contains only plural individuals. Thus the co-occurrence between *most* and *dou* is no longer a problem.

Next, let us see how the co-occurrence of *dou* with *mei* in (9) is handled. Lin assumes that *mei* is a function that takes the properties denoted by the common noun and returns the union of all the individuals that are in the extension of the common noun:

- (17)  $\parallel mei \text{ 'every'} \parallel = \text{that function } f \text{ such that for all } P \in D_{et}, f(P) = \cup \parallel P \parallel$

He essentially takes *mei*-NP as semantically equivalent to a plural definite *the Ns* without the presuppositions of a definite. As *mei* introduces plural individuals, it is expected to go naturally with the semantics of *dou*.

However, as Yang (2001) points out, although treating *mei* as a plural definite solves the problem arising from its co-occurrence with *dou*, there are noticeable differences between a *mei*-NP and a regular definite. She provides the following three differences. First, a plural definite allows for both a collective reading and a distributive

reading, a *mei*-NP only allows for a distributive reading:<sup>7</sup>

- (18) a. Naxie ren dou kang-zhe yige da xiangzi shang-le lou  
 those man dou carry-ASP one-CL big box up-ASP stairs  
 (i) ‘Those people each carried a big box upstairs’  
 (ii) ‘Those people together carried a big box upstairs.’
- b. Mei-ge ren dou kang-zhe yige da xiangzi shang-le lou  
 every-CL man dou carry-ASP one-CL big box up-ASP stairs  
 ‘Every one carried a big box upstairs.’

Second, in a generic context, *mei*-NPs allow for a generic construal but plural definites don’t, similar to their English counterparts:

- (19) a. Naxie gou dou you yi-tiao weiba  
 those dou dou have one-CL tail  
 ‘Those dogs all have a tail.’ -generic reading impossible
- b. Meizhi gou dou you yi-tiao weiba  
 every-CL dou dou have one-CL tail  
 ‘(In general) every dog has a tail’ -generic reading possible

Third, in postverbal position, *mei*-NPs and regular definites differ in their ability to support discourse anaphora. A regular definite ‘those men’ doesn’t block discourse

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<sup>7</sup> I have a different judgment on this sentence. For me, (18) has only the distributive reading but not the collective reading. That is, the use of *dou* in this sentence gives only the distributive reading. The collective reading can also be ruled out by Lin’s Proper Subset Condition. If four men carried a box together, it is not the case that two or three of the four people also carried a box together.

anaphora of ‘that book’, a *mei*-NP does.

- (20) a. Wo songle naxieren yiben shu. Nabenshu haokanjile  
 I give-LE those man one-CL book. That-CL book very-interesting  
 ‘I gave those men a book. That book is very interesting.’
- b. Wo songle meige ren yiben shu. \*Nabenshu haokanjile  
 I give-LE every-CL man one-CL book. That-CL book very-interesting  
 ‘I gave everyone a book. That book is very interesting.’

To avoid these problems, Yang proposes that *mei* is a generalized quantifier but one that is built on plural individuals, preserving Lin’s insight:

$$(21) \quad ||mei \text{ ‘every’} || = \lambda P \lambda Q [\exists X (\forall x (x \in X \leftrightarrow P(x)) \wedge Q(X))]$$

Under this approach, (9) can be represented as something like the following<sup>8</sup>:

$$(22) \quad \exists X (\forall x (x \in X \leftrightarrow \text{kid}'(x)) \wedge \forall y [y \in ||Cov|| \& y \subseteq X \rightarrow \text{draw a picture}'(y)])$$

This says that there is a sum of kids  $X$  and each individual  $x$  that is a member of the sum  $X$  is a kid, and for all  $y$ ,  $y$  is a member of the cover and it is a subset of  $X$ ,  $y$  drew a picture. But there is nothing in the formula that enforces the full distributivity of the sentence. Yang explains this by relating it to the fact that *mei* goes only with the numeral

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<sup>8</sup> I am abstracting away from her treatment of classifiers. In her analysis, classifiers are taken as individuating instantiations of kinds in the sense of Krifka (1995) on the assumption that common nouns are kind denoting expressions of type  $e$ . Below is the definition of the classifier:

$$(i) \quad ||\text{classifier} || = \lambda n \lambda y^{\text{kind}} \lambda x^{\text{individual}} [\cup y(x) \wedge \text{CL}'(x)=n], \text{ where } n \text{ is number.}$$

Following the definition of (i), *yige haizi* ‘one-CL-kid’ is represented as follows:

$$(ii) \quad \text{one-ge +kid} = \lambda y^k \lambda x^i [\cup y(x) \wedge \text{CL}'(x)=1] \quad \langle e^k \langle e^i t \rangle \rangle \\
= \lambda x^i [\cup \text{KID}(x) \wedge \text{CL}'(x)=1] \quad \langle e^i, t \rangle$$

The numeral *yi-ge-haizi* ‘one-ge-kid’ in (ii) denotes the set of individuals that are instantiations of the kid-kind and the number of the individuals is one. It is an expression of type  $\langle e, t \rangle$ .

*yi* ‘one’. Thus the only possible salient cover for *mei* NPs is the one that contains singular individuals.

Although Yang takes *mei* as a generalized quantifier rather than a plural definite as Lin does, by building it on a plurality, her net result is the same as Lin’s. That is, *dou* is a distributive operator and it distributes over a plural denoting argument. Thus her analysis doesn’t interfere with the basic picture of Lin’s in two crucial aspects: distributivity and plurality.<sup>9</sup>

Against this background, below we look at the topics we are going to discuss in this thesis and see how these topics challenge the analysis of *dou* outlined above.

### 1.3 Issues and problems

The first topic we discuss is *dou* in the context of quantifier NPs. We know from the above that *dou* goes with quantifier NPs in Chinese, a problem that has been solved by taking quantifier NPs as introducing plural individuals. However, what is not discussed is that *dou* not only goes with quantifiers, it also shows (dis) harmony effect with respect to the quantifiers. As shown in (23)-(24), it is harmonious with quantifiers such as *mei*-NP ‘every’, *dabufen*-NP ‘most’, and *henduo* ‘many’ etc. but not with *yixie* ‘some’, *henshao* ‘few’, and *yishaobufen* ‘a small portion’.<sup>10</sup>

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<sup>9</sup> Huang (2004) approaches the co-occurrence of *mei* and *dou* from a totally different perspective. She starts by drawing a parallel between *mei* and *every* as a generalized quantifier. Then she proposes that *dou* is a sum operator. But she discusses only *mei* in her paper without talking about other quantifiers. Therefore, I do not adopt her approach here.

<sup>10</sup> I use ‘\*’ for both ungrammatical and pragmatically unacceptable sentences. It should

- (23) Meige/Dabufen/Henduode            haizi    dou   hua le   yifuhua.  
 every-CL/most/many                    kid        dou   draw-CL one-CL picture  
 ‘Every/Most/Many kids drew a picture.’
- (24) \*Yixie/\*Henshaode/ \*Yishaobufen    haizi        dou hua le    yifuhua.  
 some/few/a small portion                kid        dou hua le    yifuhua.  
 ‘Some/Few/A small portion of kids draw a picture.’

The problem it poses for the above analysis is that distributivity and plurality don’t seem to be sufficient to explain this puzzle. All of the quantifiers are presumably plural and thus should be compatible with *dou* and be open to distribution by it. This will be addressed in chapter 2, where I propose that there is another dimension to the semantics of *dou*. It introduces a presupposition about prior expectations that only the quantifiers in (23) are able to satisfy.

The second topic we will discuss involves *dou* in a structure where plurality is not needed to license *dou*. Instead, focus is the crucial licensing factor. This is shown in (25). In addition, such sentences have interpretations very similar to complex constructions in which *dou* co-occurs with the particle *lian* ‘even’ and appear to be substitutable by *ye* ‘also’ when it does:

- (25) [John]<sub>f</sub>    dou        hua le yifuhua.  
           John        dou        draw -ASP one-CL picture

---

be clear from the discussion in the text when ‘\*’ does not indicate ungrammaticality.

‘Even John drew a picture.’

- (26) (Lian) [John]<sub>f</sub>      dou/ye      hua le yifuhua.  
       even      John      dou/also      draw –ASP one-CL picture

‘Even John drew a picture.’

What is in common to all three structures is that they have a scalar reading similar to the meaning *even* has in English. These structures raise two questions for the analysis of *dou*. First, how does focus override the plurality requirement? Second, where does the scalar reading come from? I attempt to answer these questions in chapter 3 by investigating some often-taken-for-granted properties of *dou*. In particular, I will ask whether *dou* alternates freely with *ye*, whether *lian* is really optional and why *lian* is dependent on *dou/ye*. Answers to these questions lead me to a conclusion that supports the view that scalar *dou* requires a separate account from that of distributive *dou*, as proposed independently in Sybesma (1996), Zhang (1997), and Hole (2004). I also suggest that scalar *dou* is linked to distributive *dou* via the context sensitivity I propose in connection with *dou*-(dis)harmony.

The third area to be investigated is *dou* in a context that involves some sort of modality or non-episodicity. As exemplified in (27)-(28), *dou* co-occurring with *renhe*-NPs ‘any’ or *wh*-NPs in a modal or a non-episodic context may get a free choice reading, equivalent to the corresponding English sentences with free choice *any* or *wh-ever* free relatives.



(27) Renheren / Shei dou kande chulai ...

any person / who dou look out

‘Anyone can tell that....’

(28) Renhe ren / Shui dou dei zunshou jiaotongguize.

any person / who dou must obey traffic rules.

‘Anyone must obey traffic rules

These structures raise the following questions: what is the quantificational force of *renhe*-NPs or *wh*-NPs, universal, definite or indefinite? And where does the free choice effect in these sentences come from? In chapter 4, I give a careful study of the two FC structures from the perspective of English FC *any* and *wh-ever* free relatives, keeping in mind our prior discussions of *dou*. We conclude that *renhe...dou* is like *any* but *wh...dou* is neither like *any* nor *wh-ever* free relatives. We suggest relating *dou* in the two FC structures, *renhe...dou* and *wh...dou*, to distributive *dou* and scalar *dou* respectively.

After looking at *dou* in the contexts of quantifier NPs, NPs in focus, *any*-NPs and *wh*-NPs, Chapter 5 closes this thesis with a brief exploration of *dou* in the context of bare NPs. Chinese bare NPs, like English bare plurals, have kind readings with kind-level predicates, generic readings with individual-level predicates and existential readings with stage-level predicates.

(29) a. Dogs are extinct. –‘the dog kind’, kind reading

b. Dogs are intelligent. –‘all/most/typical dogs’, generic reading

c. Dogs are barking. –‘some dogs’, existential/ indefinite reading

This raises the question of how these various readings of bare NPs impact the analysis of *dou*. I make some preliminary observations about the interactions between *dou* and bare NPs. Although a full investigation is left for the future, the discussion in this chapter provides further support for our claim that there are two *dou*'s in Chinese—a distributive operator that includes a presupposition about the prior expectations on the part of the speaker and a scalar *dou* that associates with focus.

## CHAPTER 2

### DOU- (DIS) HARMONY<sup>11</sup>

#### 2.0 Introduction

In this chapter, we examine what I call the *dou*- (dis)harmony effect. *Dou* harmony refers to *dou*'s compatibility with quantifier phrases such as *mei*-NP 'every' and *dabufen*-NP 'most'. *Dou*-disharmony refers to *dou*'s incompatibility with quantifier phrases such as *yixie* 'some' and *henshao* 'few'. This phenomenon has been noticed and there has been some discussion in the literature but the current analyses do not address the problem satisfactorily. Liu (1990) and Wu (1999), for example, have attempted to characterize the NPs that show *dou*-compatibility under the notions of monotonicity and strong/weak NPs respectively. But as we show below, neither of these notions seems adequate in characterizing this phenomenon. Other studies, such as Lin (1998) and Yang (2001), studied the *dou*-harmony effect and maintained that it be dealt with the way *dou* is handled in the context of a plural definite. But they did not address the problem of *dou*-disharmony. The goal of this chapter is to seek an answer to the *dou*-(dis)harmony problem, adopting the analysis of *dou*-quantification in Lin (1998) and Yang (2001). The main contribution of this chapter is to show that context sensitivity has to be built into the meaning of *dou*.

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<sup>11</sup> An early version of this chapter has been published in the Proceedings of *NELS* 35.

The chapter is organized as follows. 2.1 lays out the basic facts regarding *dou*-(dis)harmony. 2.2 provides critiques on two previous approaches to this problem. 2.3 builds on the approach of Lin (1998), identifying the source of the problem. The semantics of *henduo-NP* ‘many’ and *henshao-NP* ‘few’ are discussed in particular. 2.4 provides evidence for the conclusion reached in 2.3. 2.5 shows how the disharmony problem presented in 2.3 is accounted for. 2.6 extends the proposed analysis of *dou* to its interaction with quantifiers that are not context dependent. Specifically, the semantics of *dabufen* ‘most’, *mei* ‘every’ and *yixie* ‘some’ are discussed and their (in) compatibility with *dou* are explained. 2.7 talks about *zhiyou* ‘only’ and its relation with *dou*. 2.8 concludes the chapter.

### **2.1. The Basic facts: *dou*- (in) compatibility with quantifier NPs**

As mentioned earlier, *dou* contrasts with *all* not only in its compatibility with quantifiers but also in its behavior with respect to different quantifier phrases. As shown below, neither of the quantifiers in (1) is compatible with *all* in English, but the corresponding quantifiers of (1a) in Chinese in (2) are compatible with *dou* and the corresponding quantifiers of (1b) in Chinese in (3) are not compatible with *dou*. I call this phenomenon demonstrated in (2) and (3) *dou* (dis)harmony.

- (1) a. Every/All/Most/Many teacher(s) ( \*all) bought a house.  
 b. A few/Very Few/Some teachers (\*all) bought a house.

- (2) Womenxi meige /suoyou de/ da bufen/ henduo laoshi dou maile fangzi  
 our dept mei-CL all DE <sup>12</sup> (one) big part teacher dou buy-ASP house  
 ‘Each/All/Most/Many teacher(s) in our dept. bought a house’
- (3) Yi xiao/shao bufen /Henshao/ Yixie/Youxie laoshi (\*dou) maile fangzi  
 one small/few part/few/some teacher dou buy-ASP house  
 ‘(There are) a small proportion/few/some teachers who bought their houses’

*Dou* not only shows compatibility with certain quantifiers and incompatibility with others, it also involves the issue of optionality. That is, among the *dou*-compatible ones in (2), the presence of *dou* is not always required. As in (4), *dou* is obligatorily required for only for group 1 quantifiers: *mei*-NP ‘every’ and *suoyou*-NP ‘all’, but it is optional for group 2 quantifiers: *henduo* ‘many’ and *dabufen* ‘most’. The complete paradigm of the *dou*-quantifier relation is summarized in (5):

(4) *dou*-compatible quantifiers

	Quantifier phrases	The presence of <i>dou</i>
Group 1	<i>mei</i> -NP ‘every’ <i>suoyoude</i> -NP ‘all’...	Obligatory
Group 2	<i>dabufen</i> -NP ‘most’ <i>henduo/xuduo</i> -NP ‘many’...	Optional

<sup>12</sup> *De* is normally used in Mandarin Chinese to combine two nominal expressions. For example, the English equivalent of *all teachers* in Chinese is [suoyou -de- laoshi] ‘all-de-teacher’.

(5)

	Quantifier phrases	The presence of <i>dou</i>
Group 1	<i>mei</i> -NP ‘every’ <i>suoyoude</i> -NP ‘all’...	Obligatory
Group 2	<i>dabufen</i> -NP ‘most’ <i>henduo/xuduo</i> -NP ‘many’...	Optional
Group 3	<i>youxie</i> -NP ‘some’ <i>henshaode</i> -NP ‘few’ ...	*

In the rest of this chapter, I try to find an answer to the *dou* (dis)harmony problem.

I will explain why *dou* is compatible with group 1 and 2 quantifiers but not with the group 3 quantifiers. I will also discuss the optionality issue as we move along.

## 2.2 Critiques on previous approaches

The different properties of quantifier phrases in relation to *dou*-quantification in (5) make us wonder whether some current theories of NPs will help us settle the problem. In other words, can the quantifiers, group 3 quantifiers for example, be classified as a natural class sharing some common features such that they can be treated separately from the *dou*-compatible ones in group 1 and 2? Below I will present two proposals that take this general approach and argue that they are not adequate. I will first present Wu’s (1999) analysis, which appeals to the strong/weak distinction and then Liu’s (1990), which appeals to the concept of monotonicity. After showing that these approaches are not successful, I turn to the approach of Lin (1998) and Yang (2001) and ask why the

co-occurrence of *dou* with some quantifiers breaks down. I conclude that this breakdown is not because of the involvement of weak NPs or monotonic decreasing NPs but because of the context dependency of *dou*.

### 2.2.1 The strong/weak NP hypothesis of Wu (1999)

Wu (1999) focused on the syntax of *dou*. He proposed that *dou* is the head of a functional projection Distributional Phrase (DistP) that is quantificationally strong with a strong Q- feature. Its strong Q-feature needs to be checked by a strong NP with an equally strong Q-feature via movement or spec-head agreement. In his view, all *dou*-compatible NPs are strong NPs in the sense of Barwise and Cooper (1981). According to Barwise & Cooper, the strong/weak distinction is the property that determines the distribution of NPs in an existential construction. For example, NPs such as *every man* and *the man* in (6) that can't appear in an existential construction are strong NPs and NPs such as *some man* and *few men* in (7) that can appear in this construction are weak NPs.

- (6) a. \*There is *every man* in the room.      -strong NP  
       b. \*There is *the man* in the room.        -strong NP
- (7) a. There is *some man* in the room.        -weak NP  
       b. There are *few men* in the room.       -weak NP

According to Wu, the Chinese equivalents of *every man* and *the man* in (6) will be strong NPs and are thus *dou* quantifiable, whereas the Chinese equivalents of *some man*

and *few men* in (7) will be weak NPs that are not *dou*-quantifiable.

In the meantime, he also acknowledged that *henduo*-NP ‘many’ seems a counterexample to his generalization. First, it may co-occur with *dou*, which suggests that it is a strong NP. But on the other hand, it may appear in an existential construction, a property of a weak NP. This is shown below. In (8a), *henduo* is quantified by an existential *you* ‘exist’ and in (8b) *henduo*-NP ‘many’ co-occurs with *dou*.

- (8) a. Fanjianle    you    henduo    xuesheng  
          room inside   exist   many   student  
          ‘There are many students in the room’
- b. Henduo    xuesheng    dou    chuxile    huiyi  
          many   student    dou   attend -ASP   meeting  
          ‘Many of the students attended the meeting’

To deal with the dual properties exhibited by *henduo* ‘many’, Wu suggested that this is because *henduo* ‘many’ is ambiguous between a partitive reading and an existential reading. And examples like (8b) are acceptable only under the partitive reading. That is, the speaker takes the number of students attending the meeting in proportion to a discourse-fixed set of students. Suppose the discourse-fixed set of students contains 20 members and 6 out of 10 counts as *many*, then for (8b) is true, there must be 12 or more students attending the meeting. The partitive reading is a strong reading; hence the use of *dou* is ok. (8a), on the other hand, is acceptable only under the existential interpretation. That is, there is no discourse-fixed set of students for its truth evaluation. He also



suggests that the partitive reading of *henduo xuesheng* is equivalent to English *many of the students* and the existential reading of *henduo xuesheng* is equivalent to English *many students*. Their difference is reflected in the existential construction in (9).

- (9) a. ? There are many of the students in the room.  
 b. There are many students in the room.

While I agree with him that *henduo* ‘many’ has the two readings mentioned above and the partitive reading may be strong, I don’t think partitivity plays a crucial role in licensing *dou*. Below I provide evidence from both covert partitives and overt partitives to argue against this view.

First, there are ‘covert’ partitives that don’t license *dou*. This is illustrated below. As Wu mentioned in his footnote, the construal with the NP moving over the quantifier in the form of [NP-quantifier] has only the partitive reading. Specifically, (10) can only mean that many students out of a fixed set attended the meeting.

- (10) [ Xuesheng henduo ] dou chuxile huiyi  
 student many dou attend -ASP meeting

- (i) Many of the students attended the meeting  
 (ii) \*There are many students attending the meeting

However, *youxie* ‘some’ in (11), constructed this way, also has the partitive reading. Yet it can’t host *dou* as would be expected in this approach.

(11) [ Xuesheng youxie ] (\*dou) chuxile huiyi  
 student some attend -ASP meeting

(i) Some of the students attended the meeting

(ii) \*There are some students attending the meeting

Thus the contrast between *hendo* ‘many’ and *youxie* ‘some’ with respect to *dou*-compatibility ( *henduo...dou/ \*youxie... dou* ) still shows up when both are interpreted as having partitive readings. This being the case, it casts some doubt on Wu’s claim that it is the partitive reading of *many* that licenses the use of *dou*.

On the other hand, there are overt partitives that don’t license *dou* either. In (12), *2/3 of the students* is fine with *dou* but *1/3 of the students* is not. If what matters in determining *dou*-compatibility is the involvement of a partitive NP, this contrast remains unexplained, because both partitives are strong NPs and both should be compatible with *dou*.

(12) Sanfenzhier / \*Sanfenzhiyi de xuesheng dou laile.  
 2/3 / 1/3 DE student dou come-ASP  
 ‘ 2/3 / 1/3 of the students came.’

Furthermore, as in (13), both partitives can be used in the existential construction. If we follow Wu’s reasoning, this suggests that both partitives are weak NPs and neither of them should be able to co-occur with *dou*, contrary to fact.<sup>13</sup>

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<sup>13</sup> In addition, bare NPs also show variability in *dou*-(dis)harmony although bare NPs can be used in the existential construction as well. As shown in (i), *dou* is ok in the context of (ia) but not in the context of (ib). But a bare NP may occur in the existential construction as in (ii).

- (13) You sanfenzhier / sanfenzhiyi de xuesheng laile.  
 exist 2/3 1/3 DE student come-ASP  
 ‘2/3/1/3 of the students came.’

Based on the above, I conclude that the strong/weak classification cannot be the right characterization for the NP-*dou* interaction; at least the partitivity-based notion of strong NP doesn't seem to be the right generalization for the *dou*-harmony effect.

### 2.2.2. The monotonicity-based hypothesis of Liu (1990)

Liu (1990) studied scope dependency among NPs in English and Chinese and proposed that NPs can be classified into generalized specific (G-specific) NPs and non-specific NPs by observing their relations with other NPs with respect to scope. She further suggested that this division of NPs applies to *dou*-quantification. In particular, she suggested that *dou*-quantifiable NPs are G-specific and *dou*-non-quantifiable are non-specific. Crucially relevant to our discussion is that in her system, monotone decreasing NPs are labeled as non-specific. Thus the real question for us is whether

- 
- (i) a. Gou (dou) hen congming  
 dog dou very smart  
 ‘Dogs are intelligent’  
 b. Niao (\*dou) hui shuohua  
 bird dou can talk  
 ‘Birds can talk’  
 (ii) Fangjianli you gou.  
 room inside have dog  
 ‘There are dogs in the room’

We will discuss more on bare NPs in chapter 5.

monotone decreasing NPs characterize correctly the *dou*-incompatible NPs. As we see below, this is not true because *dou*-incompatible NPs don't show uniform monotonic properties as would be predicted under her view.

Monotonicity<sup>14</sup> of a quantifier is defined either with respect to the verb phrase, indicated as  $\text{DET} \uparrow$  (right monotone increasing) and  $\text{DET} \downarrow$  (right monotone decreasing) or with respect to the noun phrase, indicated as  $\uparrow \text{DET}$  (left monotone increasing) or  $\downarrow \text{DET}$  (left monotone decreasing) on the basis of the inferences a quantifier licenses. Below we test both the VP argument and the NP argument, showing that monotonic decreasingness doesn't seem to be adequate to characterize the *dou*-incompatible NPs.

A quantifier is said to be right monotone increasing ( $\text{mon} \uparrow$ ) if the sentence of the form  $Q(A, B)$  licenses an inference to a more general sentence  $Q(A, B')$ , where  $B \subseteq B'$  and a quantifier in a sentence is right monotone decreasing ( $\text{mon} \downarrow$ ) if the sentence of the form  $Q(A, B)$  licenses an inference to a more specific sentence  $Q(A, B')$ , where  $B' \subseteq B$ . For example, in (14), *all* and *some* are right monotone increasing quantifiers because in each case, the statement on the left entails the statement on the right when the specific predicate 'BMW' is replaced by the more general predicate 'car'. In comparison, *no*, and *few* in (15) are monotone decreasing because they license more specific inferences when the general predicate 'car' is replaced by its subset 'BMW'.

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<sup>14</sup> This discussion is based on Barwise and Cooper (1981). See also Chierchia & McConnell-Ginet (2000).

- (14) a. All students bought BMWs.  $\implies$  All students bought cars.  
 b. Some students bought BMWs.  $\implies$  Some students bought cars.
- (15) a. No students bought cars.  $\implies$  No students bought BMWs.  
 b. Few students bought cars.  $\implies$  Few students bought BMWs.

A parallel criterion can be applied to test the monotonicity of the left argument of a quantifier. A quantifier is said to be left monotone increasing ( $\uparrow$  mon) if the sentence of the form  $Q(A, B)$  licenses an inference to a more general sentence  $Q(A', B)$ , where  $A \subseteq A'$ . A quantifier is left monotone decreasing ( $\downarrow$  mon) if the sentence of the form  $Q(A, B)$  licenses an inference to a more specific sentence  $Q(A', B)$ , where  $A' \subseteq A$ . For example, *some* in (16) is a left monotone increasing quantifier because it results in a more general inference when replacing ‘Chinese students’ with ‘students’. But *all* in (16) is not. In contrast, *no* and *few* in (17) are left monotone decreasing because they license more specific statements when replacing ‘students’ with ‘Chinese students’.

- (16) a. Some Chinese students bought cars.  $\implies$  Some students bought cars.  
 b. All Chinese students bought cars.  $\not\implies$  All students bought cars.
- (17) a. No students bought cars.  $\implies$  No Chinese students bought cars.  
 b. Few students bought cars.  $\implies$  Few Chinese students bought BMWs.

Now we turn to Chinese. Below we use *henshao* ‘few’ and *youxie* ‘some’ to show that monotonicity is not the decisive element in separating *dou*-compatible quantifiers from those that are not. *Henshaode* ‘few’ in (18) is right monotone decreasing because it supports the set-subset inference. But *youxie* ‘some’ in (19) is not because the same

set-subset inference is not licensed. On the contrary, it is right monotone increasing because the statement on the right entails the one on the left.

(18) Henshao de xuesheng you chezi  $\implies$  Yenshao de xuesheng you BMW  
 ‘Few students have cars.’ ‘Few students have BMW.’

(19) Youxie xuesheng you chezi  $\not\implies$  Youxie xuesheng you BMW.  
 ‘Some students have cars’ ‘Some students have BMW’

The above contrast is also seen in the left arguments of the two quantifiers. For example, *henshaode* ‘few’ in (20) is left monotone decreasing and *youxie* ‘some’ in (21) is left monotone increasing.

(20) Henshao de xuesheng you chezi  $\implies$  Henshao de zhongguo xuesheng you chezi  
 ‘Few students have cars.’ ‘Few Chinese students have cars.’

(21) Youxie xuesheng you chezi  $\not\implies$  Youxie zhongguo xuesheng you chezi  
 ‘Some students have cars’ ‘Some Chinese students have cars’

(22) summarizes the contrast between *henshao* ‘few’ and *youxie* ‘some’ in terms of their monotonicity.

(22) Monotonicity and *dou*-compatibility

Quantifiers	Monotonic property	<i>Dou</i> -compatibility
<i>henshao</i> ‘few’	↓ mon, mon ↓	*
<i>Youxie</i> ‘some’	↑ mon, mon ↑	*

The two quantifiers show different monotonicity, yet they have the same *dou*-disharmony effect. I take this as evidence that monotonicity doesn't characterize the properties of the quantifiers in question. As we show below in 2.4, numerals provide further evidence against this approach. In particular, although numerals have fixed monotonicity, they show variability in *dou*-harmony, which is unexpected in this approach.

Above we showed that neither the strong/weak approach nor the monotonicity approach is satisfactory in dealing with the *dou*-(dis) harmony effect. In the next section, I pursue a solution to this problem within the approach to *dou*-quantification in Lin (1998) and Yang (2001).

### 2.3 Locating the problem.

Recall from chapter 1 the analysis of Lin (1998) in which he proposes the following semantics for *dou* and *dabufen* 'most':

$$(23) \quad \textit{dou} = \lambda P \lambda X \forall_y [y \in \text{Cov} \ \& \ y \subseteq X \rightarrow P(y)]$$

$$(24) \quad \textit{dabufen} \textit{'most'} = \lambda P \lambda Q \exists Z \exists X [P(X) \ \& \ \forall Y (P(Y) \rightarrow Y \subseteq X) \ \& \ Z \subseteq X \ \& \ Q(Z) \\ \& \ |Z| > |X| - |Z|]$$

*Dou* is an overt equivalent of the generalized D-operator in the sense of Schwarzschild (1991) and *dabufen* introduces an existential quantification over plural individuals. This accounts for the co-occurrence of *most-dou* in the examples such as (25) below.

- (25) Dabufen ying'er      dou zhang      de hen xiang  
 Most baby                dou    grow    DE very alike  
 'Most babies look a lot alike.'

In (25), the distribution can't be down to each individual baby because it doesn't make sense to say each baby looks alike. By introducing *Cov* to the meaning of *dou* as in (23), it ensures that the distribution of *dou* is over the right partitions of the plural argument. In addition, treating *dabufen* 'most' as denoting plural individuals as in (24) explains why *dabufen* goes with *dou* whereas English *most*, just like *every* doesn't go with *all*: English *most* is usually assumed to be inherently distributive, thus it doesn't make available any plural individual for *all* to be associated with.

Following Lin, I assume that all Chinese quantifiers are built on plural individuals, thus their meaning is compatible with the distributive operator *dou*. And I propose the following definitions for *henduo* 'many' and *henshaode* 'few'.

- (26) || *henduo* 'many' || =  $\lambda P \lambda Q \exists Z \exists X [P(X) \ \& \ \forall Y (P(Y) \rightarrow Y \subseteq X) \ \& \ Z \subseteq X \ \& \ Q(Z) \ \& \ |Z| \geq n]$ , where *n* is contextually specified.

- (27) || *henshao* 'few' || =  $\lambda P \lambda Q \text{Max-}Z [P(Z) \ \& \ Q(Z) \ \& \ |Z| < n]$ , where *n* is contextually specified.

(26) is similar to *most* except for the condition,  $|Z| \geq n$ . It says that there are two sets of individuals *X* and *Z* that meet the description of the common noun. *Z* is a subset of *X*, which contains all the individuals in the context, and *Z* has the property denoted by the predicate and its cardinality is equal to or bigger than the contextually determined



value of  $n$ . (27) says *few* introduces a maximal set of individuals  $Z$  that satisfy the description of the common noun,  $Z$  has the property denoted by the predicate, and its cardinality is smaller than the contextually specified  $n$ . Below we see what happens when they combine with *dou*. We look at the sentence with *many...dou* first.

(28) Henduo haizi *dou* huale hua  
 many kid *dou* draw-ASP picture  
 ‘Many kids drew a picture.’

- (29) a.  $dou$  VP  $\implies \lambda X \forall y [y \in \parallel Cov \parallel \ \& \ y \subseteq X \rightarrow \text{draw}'(y, \text{picture})]$   
 b. many NP  $\implies \lambda Q \exists Z \exists X [KID'(X) \ \& \ \forall Y (KID'(Y) \rightarrow Y \subseteq X) \ \& \ Z \subseteq X$   
 $\ \& \ Q(Z) \ \& \ |Z| \geq n]$   
 c. Many NP *dou* VP  $\implies \exists Z \exists X [KID'(X) \ \& \ \forall Y (KID'(Y) \rightarrow Y \subseteq X) \ \& \ Z \subseteq X \ \&$   
 $\ \forall y [y \in \parallel Cov \parallel \ \& \ y \subseteq Z \rightarrow \text{draw}'(y, \text{picture})] \ \& \ |Z| \geq n]$

This says that there is a plural individual  $X$  that comprises all the kids and there is another plural individual  $Z$  that is a subset of  $X$  and for all  $y$ , if  $y$  is in the cover and  $y$  is a subset of the set denoted by  $Z$ ,  $y$  drew a picture, and the cardinality of  $Z$  is equal to or bigger than the contextually determined value of  $n$ . So suppose 12 out of 20 counts as *many*, then (29) is true if the number of kids who drew a picture is 12 or more. And assuming that *Cov* contains only individual kids, the sentence is true if each of the 12 kids has drawn a picture. As a result, the combination of *many* and *dou* fares well.

Now let's look at the case with *few...dou*.

- (30) \* Henshaode haizi dou huale hua <sup>15</sup> \*few...dou  
 few kid dou draw-ASP picture  
 ‘Few kids draw a picture.’

- (31) a.  $dou$  VP  $\implies \lambda X \forall y [y \in \parallel Cov \parallel \& y \subseteq X \rightarrow \text{draw}'(y, \text{picture})]$   
 b.  $few$  -NP  $\implies \lambda Q \text{Max } Z [\text{KID}'(Z) \& Q(Z) \& |Z| < n]$   
 c. Few NP  $dou$  VP  $\implies \text{Max } Z [\text{KID}'(Z) \& \forall y [y \in \parallel Cov \parallel \& y \subseteq Z \rightarrow \text{draw}'(y, \text{picture})] \& |Z| < n]$

This says there is a maximal plurality of kids of  $Z$  and for all  $y$ , if  $y$  is a member of the  $Cov$  and  $y$  is a subset of  $Z$ ,  $y$  has drawn a picture and the cardinality of  $Z$  is less than the contextually determined value of  $n$ . Suppose 6 out of 20 counts as *few* and the maximal number of kids we consider in this context is 6, then (31) is true if each of the 6 kids has drawn a picture, assuming again the  $Cov$  contains only individual kids. Presumably there should not be any problem here because the NP, *few kids*, is able to introduce a plurality that serves as the argument of *dou*. But as it turns out, *few* NP is bad co-occurring with *dou* in contrast to *many* NP:

- (32) <sup>OK</sup> *henduo* ‘many’... *dou* ; \* *henshao* ‘few’... *dou*

This shows that plurality is not sufficient to license *dou* and there must be

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<sup>15</sup> *Henshao* can also appear in the preverbal position to mean *seldom*:

- (i) Ta zhoumo henshao kanshu  
 he weekend seldom read book  
 ‘He seldom reads books at the weekend.’

But this is different from the quantifier *henshao* we are considering here. For example, in (ii), *henshao* can’t appear in the preverbal position as it is in (i).

- (ii) Zhiyou henshao de guojia yongyou hewuqi  
 only few country have nuclear weapon.  
 ‘Only a few countries own nuclear weapons.’

something else that is responsible for the above contrast. If we compare (29) and (31), we find that both the well-formed one with *henduo* ‘many’ and the ill-formed one with *henshao* ‘few’ are sensitive to the contextually specified choice of  $n$ . So if the value of  $n$  is set in a certain context, then *dou* seems to be compatible with a quantifier whose cardinality of  $Z$  in a given context is bigger than  $n$  and incompatible with a quantifier whose cardinality of  $Z$  in a given context is smaller than  $n$ . This being said, the question then is how  $n$  is set. I will deal with this in the next section. I suggest that *dou* has a context sensitivity similar to the kind of context sensitivity displayed by *henduo* ‘many’ and *henshao* ‘few’. I will argue that the co-occurrence depends on the matching of the context sensitivity of the two expressions in a sentence. In particular, I show that the use of *dou* is good when the cardinality of the plural argument involved in a context is considered as *many* and its use is bad when the cardinality of the plural argument is considered as *few*.

## **2.4 Evidence for the context dependency of *dou***

In this subpart, I use numerals as evidence for the context dependency of *dou*. In particular, I claim that *dou* carries a presupposition relevant to the expectation of the speaker in line with the context dependency of *many/few*. Below we discuss the presupposition of *dou* first and then we discuss the context-dependency of *many* and *few*.

### **2.4.1 Presupposition of *dou***

As discussed by Chierchia and McConnell-Ginet (2000), a presupposition of a sentence *S* is a proposition *p* that is implied and taken for granted. For example, (33a) presupposes (33b). (33b) is implied and taken for granted when (33a) is uttered.

- (33) a. John has stopped drinking wine for breakfast.  
 b. John used to drink wine for breakfast.

The taken-for-granted nature of the presupposition of (33b) is not only implied in the assertion as in (33a), it is also implied when (33a) is negated, questioned, put in the antecedent of a conditional or in a modal context. As shown below, all of the sentences in (34) imply (33b). Chierchia and McConnell-Ginet dub this the P family test.

- (34) a. It is not the case that John has stopped drinking wine for breakfast.  
 b. Is it the case that John has stopped drinking wine for breakfast?  
 c. If John has stopped drinking wine for breakfast, she has probably begun to drink more at lunch.  
 d. It is possible that John has stopped drinking wine for breakfast.

Against this background, let us look at sentences with *dou*. We show below that *dou* also carries a presupposition.<sup>16</sup>

Consider the situation below:

- (35) We need 6 students to open a graduate course and it turned out that 10 students registered for the course.

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<sup>16</sup> Thanks to Veneeta Dayal for inspiring me to explore the presupposition of *dou* and discussions with her helped to clarify the issue.

Suppose this is a course open to all graduates and the professor who teaches the course doesn't know how many students will be interested in the course. Upon knowing the result, the professor may use either (b) or (b') in (36), with and without *dou*, to answer the request for the course enrollment:

(36) a. How many students have registered to your class?

b. Professor: You 10 ge xuesheng dou xuanle zhemeng ke. <sup>17</sup>

exist 10 CL student dou sign up this CL course

'There are 10 students who signed up for the course'

b'. Professor: You 10 ge xuesheng xuanle zhemeng ke.

'There are 10 students who signed up for the course'

These two answers are identical in terms of their truth-conditions: both convey the meaning that a certain number of students have signed up for the course. But on top of that, the (b) sentence with the presence of *dou* seems to imply the following: <sup>18</sup>

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<sup>17</sup> There may be some dialectal difference regarding the well-formedness of the co-existence of *you* and *dou* as in (36). It is perfectly fine in my Mandarin Chinese. And I also google-searched *you* and *dou* and found many sentences in which *dou* is used in *you* sentences. Here are some of those sentences. But unfortunately, I forgot to jot down the sources for these sentences.

- (i) Zhege gongsi de yuangong zhong, **you** bushao **dou** you boshi xuewei  
this CL company DE employee among, exist not few dou have doctor degree  
'Many of the employees in this company have doctoral degrees.'
- (ii) Chuguo liuxue de ren zong, **you** bushao **dou** shi zhongxuesheng  
go broad study DE person among, exist not few dou are middle school student  
'Many of those who study abroad are middle school students.'
- (iii) **You** henduozi zhebenzidian **dou** zha budao  
exist many word this-CL dictionary dou find not out  
'There are many words that can't be found in this dictionary.'

<sup>18</sup> James Huang suggested that the distinction between the two sentences in (36) is "not that of exceeding or not exceeding an expectation, but one parallel to that between 'They bought cars' and 'They all bought cars', where the former may vaguely be true even if some member of 'they'

- (37) The assertion meets or exceeds the speaker's expectation about the core predication.

And the above implication survives the P family test mentioned above:

- (38) Conditional antecedent:

Ruguo you 10 ge xuesheng      dou    xuanle      zhemeng ke,  
 if exist 10 CL student              dou    signup ASP this CL course  
 women jiu zai 110 jiaoshi shangke.  
 we will      at 110 classroom have class

'If there are 10 students who registered for this course, we will have the class at room 110.'

In (38), without the use of *dou*, we don't know whether the classroom 110 is a big classroom or not. But when *dou* is used, 110 must be a big classroom. In other words, when the professor uses *dou*, the number of students who registered for the course must be above his expectation. Otherwise, the sentence is infelicitous.

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did not buy cars". That is to say, the difference between the two sentences is whether weakening is involved or not. While the former allows pragmatic weakening, the latter with *all* doesn't (See Brisson (1998) for discussions of the anti-weakening, maximazing effect of *all*).

It may well be the case that the sentences "They bought cars" and "They all bought cars" involve weakening/non-weakening; I don't think the same reasoning applies to the sentences in (36) though. First, (36) involve numerals, which, unlike plural definites, don't allow weakening. For example, if there are 10 students in this context, and 9 students registered for the course, then it is false to say that 10 students registered for the course. Second, the domain of the sentence 'They all bought cars' is a definite and the use of *all*, according to Brisson (1998), is to make sure that each member in the definite domain bought cars. In contrast, the *dou* version of (36) doesn't mean that there are only 10 graduate students in the department and all of them registered for the course. This sentence is naturally uttered in the situation where the professor has no idea how many students may be interested in this course or how many potential students are going to take this course. Thus the sentence is more on the number of the students than on the totality of the students.

## (39) Negation

You 10 ge xuesheng dou meiyou xuan zhemen ke.

exist 10 CL student dou not sign up this CL course

‘There are 10 students who didn’t sign up for the course’.

Note that in (39), *dou* is above negation *meiyou* ‘not’.<sup>19</sup> It asserts that 10 students didn’t sign up for the course. And the use of *dou* expresses that the assertion exceeds the speaker’s expectation about the drop-outs for the course. Here is the scenario in which this sentence holds:

## (40)

There are 15 students in the first semester *Semantics 1* class and the professor has expected that 5 out of the 15 students would drop out of the second semester *Semantics 2* class. But as it turned out, 10 out of the 15 students dropped out of *Semantics 2*.

In this context, that 10 out of 15 didn’t sign up for the course exceeds what the professor has expected: 5 out of 15 will drop. Thus *dou*’s presupposition is satisfied in this context.

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<sup>19</sup> The sentence is bad when *dou* is below negation *meiyou* (\*not –dou) as shown in (i) below.

- (i) \* You 10 ge xuesheng meiyou dou xuan zhemen ke.  
 exist 10 CL student not dou sign up this CL course  
 ‘There are 10 students who didn’t sign up for the course’.

As we will discuss in chapter 3, *dou* is also above negation in the structure that gives rise to the *even* reading:

- (ii) a. [John ]<sub>f</sub> dou meiyou xuan zhemenke [dou-not]  
 John dou not sign up this CL course  
 ‘Even John didn’t signed up for the course.’  
 \*b. [John ]<sub>f</sub> meiyou dou xuan zhemenke \*[not-dou]  
 John not dou sign up this CL course  
 Intended: ‘Even John didn’t sign up for the course.’

In addition, when the presupposition is denied, the use of *dou* results in infelicity.

(41) shows that the answer with *dou* can't be followed by the conjunct 'but it is far from enough.' But this is not the case for the answer without *dou*. As shown in (42), the non-*dou* version is perfectly fine with the continuation of the above conjunct. And it is particularly true when the professor had expected to have 20 something students in his class in the context described in (35).

(41) a. How many students have signed up for the course?

b. Professor: You 10 ge xuesheng **dou** xuanle zhemeng ke,

# dan hai yuanyuan bugou

but still far not enough

'There are 10 students who signed up for the course, but that is far from enough'

(42) a. How many students have signed up for the course?

b. Professor: You 10 ge xuesheng xuanle zhemeng ke,

dan hai yuanyuan bugou

but still far not enough

'There are 10 students who signed up for the course, but that is far from enough'

In a word, *dou* carries the presupposition that the assertion meets or exceeds the speaker's expectation about the core predication. It is used only when the speaker's expectation is met. Thus in the situation described in (35), if the professor had expected 20 students to sign up for his course, then *dou* can't be used. This is because the fact that 10 registered for the course is now below the expectation of the professor. In this case,



only the non-*dou* version can be used.

- (43) You 10 *ge* xuesheng (\**dou*) xuanle zhemen ke - expected 20, \* *dou*  
 exist 10 CL student (dou) sign up ASP this CL course  
 ‘There are 10 students who signed up for the course.’

Similarly, in the context described in (40), suppose that the professor felt that none of the 15 students were capable enough to move on to *Semantics 2* and expected no one to continue, but to his surprise, 5 registered for that course. In this case, the use of *dou* in (44) becomes infelicitous because the fact that 10 didn’t sign up for the course is below his expectation that 15 wouldn’t sign up for the course.

- (44) You 10 *ge* xuesheng (\**dou*) meiyou xuan zhemen ke.  
 exist 10 CL student dou not sign up this CL course  
 ‘There are 10 students who didn’t sign up for the course’.

Thus *dou* is used only when its presupposition is satisfied, which requires that the assertion meets or exceeds the speaker’s expectation about the predication. In addition, the fact that numerals show variability in *dou*-harmony speaks against the monotonicity-based approach as introduced in 2.2.2. This is because numerals are fixed in their semantics as weak and their monotonicity is fixed and they shouldn’t display variability in *dou*-harmony if that approach were right.

#### 2.4.2. Context dependency of *many* and *few*

We show in this subsection that *many* and *few* exhibit the same sort of context

dependency as numerals when it comes to the use of *dou*. For example, in the context of (35) above, if the fact that 10 students registered for the course satisfies the expectation of the professor who teaches the course, then the professor may use *many* to describe the situation but not *few*:

- (45) a. Hendo de xuesheng xuanle zhemeng ke  
 many DE student sign up this CL course  
 ‘Many students signed up for the course’
- \*b. Henshao de xuesheng xuanle zhemeng ke  
 few DE student sign up this CL course  
 ‘Few students signed up for the course’

However, given the situation in (35), if the professor was expecting 20 students, then the reverse situation is expected: *many* can’t be used but only *few* can be used as in (46). This is because 10 students signing up for the course is below the expectation of the speaker.

- (46) \*a. Hendo de xuesheng xuanle zhemeng ke  
 ‘Many students signed up for the course’
- b. Henshao de xuesheng xuanle zhemeng ke  
 ‘Few students signed up for the course’

In the same vein, in the context of (40), the fact that 10 out of 15 didn’t register for the course exceeds the expectation of the speaker, namely 5 out of 15 didn’t register for the course, *hendo* can be used but not *henshao*.

- (47) a. Henduode xuesheng meiyou xuan zhemeng ke.  
 Many student not sign up this CL course  
 ‘Many students didn’t sign up for the course’.
- b. \*Henshao de xuesheng meiyou xuan zhemeng ke.  
 Few student not sign up this CL course  
 ‘Few students didn’t sign up for the course’.

This shows that *many* is used when the value of the contextually supplied number that is true of the predication satisfies the expectation of the speaker. And *few* is used when the value of the number involved is below the expectation of the speaker. Concretely, in a situation where the professor expects 10 students to sign up for his course, anything above 10 can be counted as *many*. Whereas in a situation where the professor expects 20 students; anything below 20 can be regarded as *few*. Thus what is counted as *few* and *many* in a context has nothing to do with the absolute value of a number involved. Rather, it is related to how the speaker perceives the number in a given context.

### 2.4.3. Summary

What we have been aiming at so far is to find a way to explain why *dou* is consistently harmonious with some quantifiers and inharmonious with others. The above discussion of the presupposition of *dou* and the context dependency of *many* and *few* leads me to conclude that the (in) compatibility between *dou* and *many* on the one

hand and between *dou* and *few* on the other is related to whether the presupposition of *dou* is met or not. *Many* is compatible with *dou* because it exerts identical level of expectation with *dou* on the part of the speaker about the predication; *few* is incompatible with *dou* because it forces an assertion that is in conflict with the expectation requirement introduced by *dou*. This being said, the job next is to find a way to represent the context dependency of *dou* such that the above contrast between *many...dou* and *few...dou* is captured. Below is my proposal for capturing this aspect of the semantics of *dou*.

## 2.5 Accounting for *dou*(dis)harmony

Recall the problematic case involving *few*, repeated below:

- (48) a. \* Henshaode haizi *dou* huale hua \**few...dou*  
 few kid *dou* draw-ASP picture  
 ‘Few kids drew a picture.’
- b.  $\text{Max } Z [\text{KID}'(Z) \ \& \ \forall_y [y \in \parallel \text{Cov} \parallel \ \& \ y \subseteq Z \rightarrow \text{draw}'(y, \text{picture})]] \ \& \ |Z| < n]$

(48) asserts that the cardinality of the maximal group of kids that is true of the predicate is below the contextually provided value of  $n$ . This amounts to saying that the maximal number of individuals that is considered in the context is below the speaker’s expectation. In light of the above discussion about *dou*, the problem with (48) is this: it fails to satisfy the expectation requirement of *dou*. As discussed above, *dou* requires that the assertion of the sentence meets or exceeds the speaker’s expectation about the

predication. Otherwise the sentence is infelicitous. I will represent the presupposition of *dou* as  $dou^{p \geq n}$ , which is meant to stand for the following:

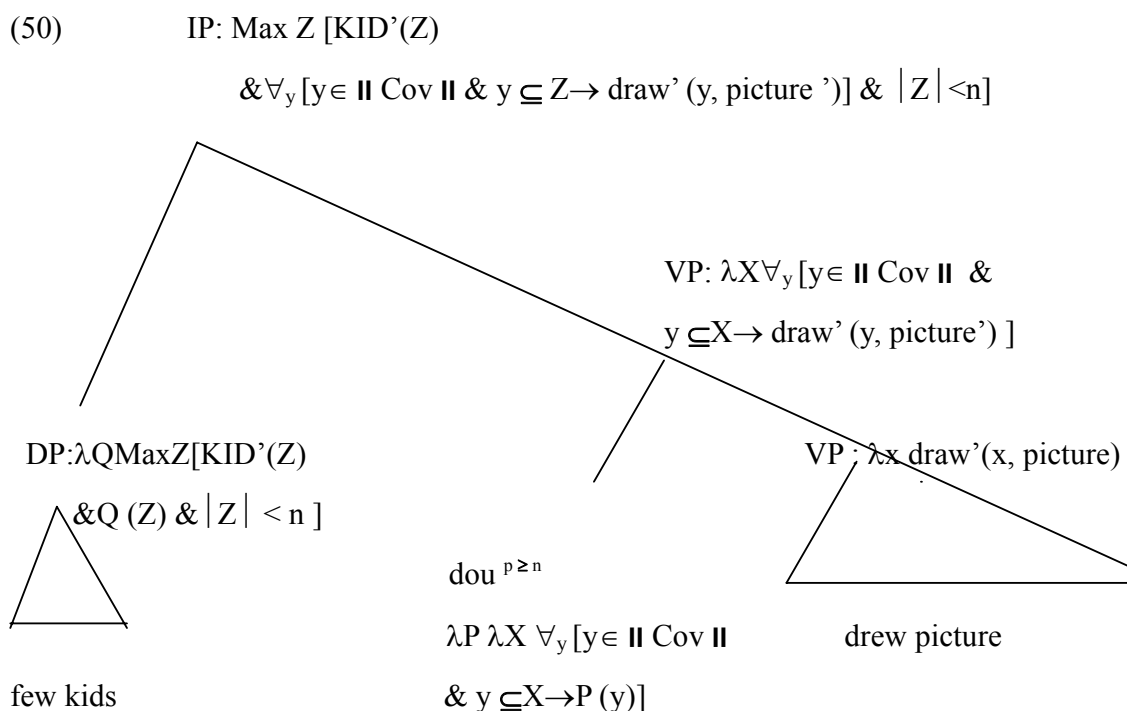
- (49) a. An assertion that the number of individuals denoted by the common noun with the property denoted by the verb phrase is equal to or greater than  $n$ .
- b. A presupposition that the speaker expected that the number of individuals denoted by the common noun with the property denoted by the verb phrase would be less than or equal to  $n$ .<sup>20</sup>

Thus the assertion of a proposition with *dou* suggests that the expectation has been met or exceeded. In other words, only those contexts that entail that the speaker had a low expectation would be contexts in which a *dou* statement could be felicitous. Our explanation of the (dis)harmony effect follows from the match or mismatch between the presupposition of *dou* and the semantics of the quantifier concerned.

With this, let us turn back to the case in (48), which is computed as follows. I do not introduce the assertion about number into the computation of the distributive operator for expository reasons.

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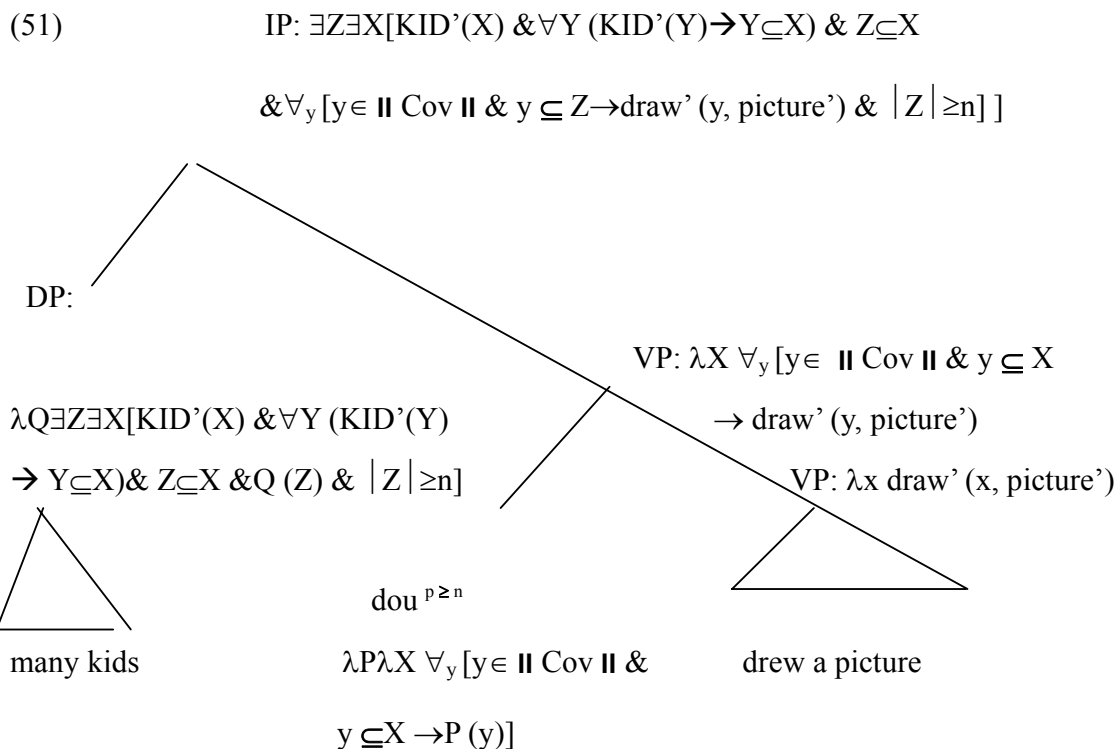
<sup>20</sup> Thanks to Veneeta Dayal for bringing to my attention the issue that the context sensitivity that comes from *dou* be kept apart from the context sensitivity that comes from the quantifier.



In light of the above discussion, (50) is felicitous only when the presupposition of *dou*,  $p \geq n$ , is satisfied. That is, the maximal plurality  $Z$  that is true of the predicate *drawing-a-picture* must be above  $n$ . However, as shown in the translation of IP, the semantics of *few* requires that the cardinality of  $\text{Max } Z$  should be smaller than the expectation  $n$ . Thus a clash results between the presupposition of *dou* and the semantics of *few* in terms of the speaker's expectation. Suppose 12 out of 20 kids involved in the drawing satisfies the speaker's expectation in this context, then the presupposition of *dou* requires that the number of kids who drew a picture be 12 or above. But the sentence with *few* is true only when the number of kids who drew a picture is below 12. This is to say, the presupposition of *dou* can't be satisfied in the context of *few* because of the conflicting expectations imposed by them. As a result, *dou* and *few* cannot co-occur

because *dou* will be undefined.

In contrast, this sort of conflict doesn't arise in the *dou* harmony case seen below:



(51) is true only when the cardinality of the plural kids who drew a picture is equal to or above the speaker's expectation. Suppose again that 12 out of 20 kids meets the speaker's expectation, then (51) is true when the cardinality of the plurality is 12 or above. And this high expectation requirement of *many* matches well with that of *dou*. As discussed above, *dou* also requires that the number of kids who drew a picture be 12 or above in this context. Thus the co-occurrence between *many* and *dou* is not a problem.

Thus far, we have developed an account for the problem posed by *dou* non-compatible quantifiers by building the context dependency into the semantics of *dou*. Specifically, we have claimed that *dou* carries a higher-than-expectation presupposition,

comparable to the context sensitivity of *many*. And under this approach, the *dou*-(dis)harmony is viewed as whether the expectation requirement imposed on *dou* is satisfied or not in a certain context. It is not due to the type of NPs that are classified in terms of monotonicity or strong/weak distinction. The advantage of this approach is that it keeps to a uniform treatment of quantifiers on the one hand and to *dou* on the other. All we need is to add an extra condition to the established semantics of *dou*. Moreover, as will be discussed in chapter 3, this expectation-oriented presupposition of *dou* is also seen to be at play in the focus structure that *dou* participates in.

After relating the *dou*-(dis) harmony problem to the context dependent *henduo* and *henshao*, we now turn to discussing the implications of this analysis for the non-context dependent quantifiers.

## 2.6 Other quantifiers

In this subpart, I discuss quantifiers that are not context sensitive. In particular, I will focus on *dou*-harmony quantifiers *dabufen* ‘most’, *mei* ‘every’ on the one hand and *dou*-disharmony quantifiers *yixie* ‘some’ on the other hand. The issue of optionality of *dou* is addressed along the way.

### 2.6.1 *dabufen* ‘most’

In chapter 1, we introduced the definition of *dabufen* and saw how it worked with *dou* as a distributor. Now, after introducing the context dependent presupposition of *dou*,



let us come back to see what prediction it makes about the co-occurrence of *dabufen* and *dou*.

Unlike *henduo* ‘many’ that is context dependent, *dabufen* is used independent of one’s expectation. For example, in the situation below in (52), *dabufen* can be used regardless of one’s expectation as in (53):

(52) There are 20 students in this class and 18 passed the exam.

(53) Dabufen xuesheng tongguo le kaoshi

most student pass ASP exam

‘Most students have passed the exam.’

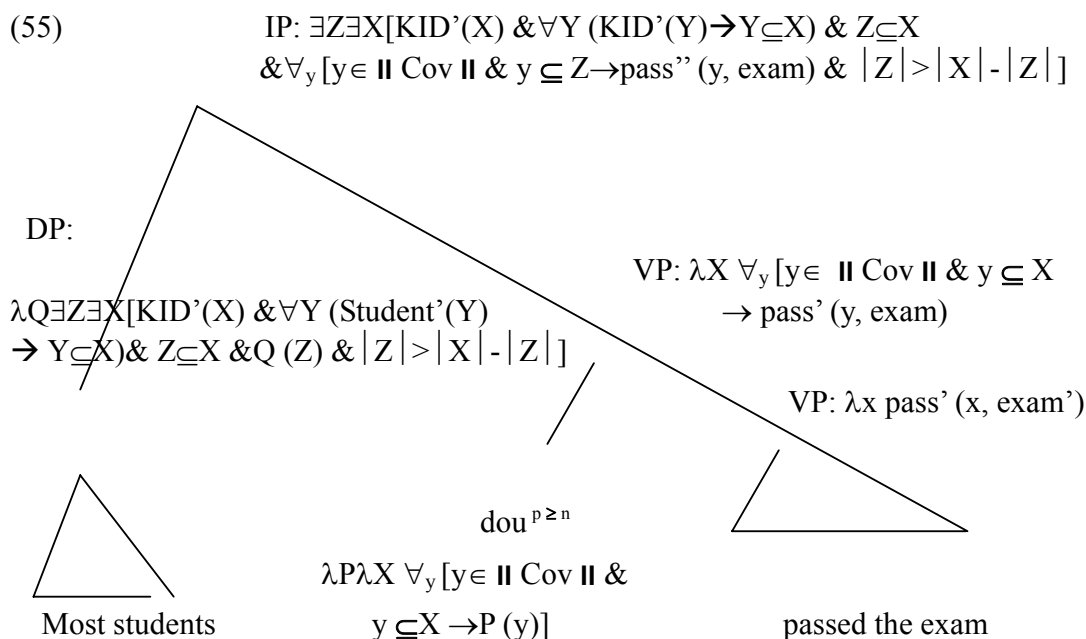
However, *dou* can also be used in this situation:

(54) Dabufen xuesheng dou tongguo le kaoshi

most student dou pass ASP exam

‘Most students have passed the exam.’

The predicted difference between (53) and (54) is that for the latter to be felicitous, the presupposition of *dou* as it is in (55) must be satisfied. This means that 18 students passing the exam must meet or exceed the speaker’s expectation. This, however, is not the case for (53). (53) is true regardless of whether the speaker’s expectation is satisfied or not.



That (54) is related to the speaker's expectation is illustrated in the following scenario. In the situation described in (52), if the speaker, the professor in this case, had expected *all* 20 students to pass the exam, then (54) with *dou* becomes odd. This is because in this situation, 18 students passing the exam is still below the expectation of the speaker. But in this situation, the expectation-neutral (53) is ok. And (53) can even be modified by *zhiyou* 'only' to indicate that the number/proportion of students involved in the context is below one's expectation.<sup>21</sup>

- (56) a. Zhiyou dabufen xuesheng tongguole kaoshi.  $\surd$  *only most*  
 'Only most students have passed the exam.'
- b. Zhiyou 90% de xuesheng tongguole kaoshi  $\surd$  *only 90%*  
 'Only 90% of the students have passed the exam.'

<sup>21</sup> More on *zhiyou* 'only' will be introduced in the next section.

That *dabufen* can be associated with low expectation is evidenced by *henduo* ‘many’. As was discussed earlier, *many* is always associated with high expectation. And as shown in (57), *many* can’t be modified by *zhiyou*, in contrast to *most*.

- (57) \* Zhiyou henduo xuesheng tongguole kaoshi. \* only many  
 ‘Only many students have passed the exam.’

The above shows that the presence/absence of *dou* does make a difference to the meaning of the sentence containing *dabufen*. With *dou*, the sentence invokes the expectation requirement on the part of the speaker. Without *dou*, the sentence is free from such requirement. This is why (53) without *dou* can be associated either with low expectation or high expectation on the part of the speaker, but (54) with *dou* is only related to the high expectation. This being the case, it indicates that *dabufen* doesn’t share the same level of expectation with *dou*. This differs from *henduo*, which is always compatible with *dou* because it has the same level of expectation with *dou*.

What I have presented here is an account of the so-called optionality of *dou* with certain quantifiers. Let us now turn to a quantifier that obligatorily takes *dou*.

### 2.6.2 *mei* ‘every’

As introduced in section 2.1, *mei*-CL-N is always compatible with *dou*. This is intuitively the case because *mei*-CL-N involves the maximal number of the individuals in the extension of the NP *mei* is attached to. In this case, we are not evaluating the speaker’s expectation against a set of individuals that is in proportion to a discourse-fixed

set of individuals, as is the case of *many*. Rather, the expectation is evaluated against the actual set of individuals in a context. And the actual set of individuals we consider is the maximal set in a context. In this context, *dou*'s context dependency should be automatically satisfied because the maximal set is the highest one can expect. Below we use an example to illustrate this point.

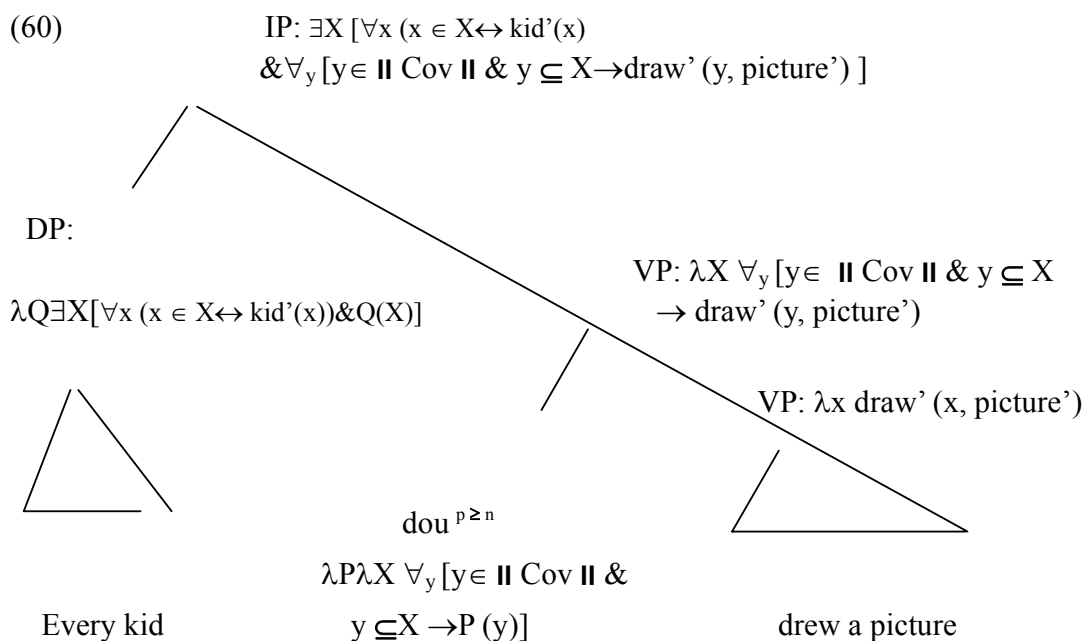
Recall that in chapter 1, we introduced Yang (2001)'s proposal of *mei* as follows:

$$(58) \quad || \textit{mei} \textit{'every'} || = \lambda P \lambda Q [\exists X (\forall x (x \in X \leftrightarrow P(x)) \wedge Q(X))]$$

With this, (59) is computed as in (60):

(59) Meiyige haizi dou huale yifu hua  
 every kid dou draw-ASP one-CL picture

'Every kid drew a picture'



This says that there is a sum of kids X and each atomic member of it is a kid, and every member of the cover, which is a subset of X, drew a picture. As mentioned earlier,

since *mei* goes only with the numeral *yi* ‘one’, Yang assumes that the only salient cover for *mei*-NP is the one that contains singular individuals. Thus the sentence is true if each of the kids drew a picture. Our proposal further requires that the sentence be felicitous, that is, it requires the context to satisfy the presupposition of expectation. Suppose there are 10 kids in the context, then *dou* requires that each of the 10 kids drew a picture meets or exceed the speaker’s expectation. Since 10 is the maximal number of kids in the context, *dou*’s expectation requirement is automatically satisfied because no one can have an expectation higher than that. The point is clear if we compare *mei* with *henduo* ‘many’. If 6 out of 10 will satisfy the presupposition of *dou* when that is considered as *henduo* ‘many’, then 10 out of 10, as in the case of *mei*, will definitely do so, because the former is entailed by the latter.

I have shown that it is not possible for a statement with *mei* to be lower than a speaker’s expectation. But there is still the possibility that the speaker might not have had any expectation. In that context, one might think that it would be possible to omit *dou*, but this is not the case. For example, the Chinese equivalent of (61a) still requires *dou* even if the speaker had not had any expectation about the event.<sup>22</sup>

(61) a. I didn’t know there was going to be a party so I was surprised to find everyone there.

b. Wo hen jingya meige ren \*(dou) zai nar  
 I very surprised every-CL person dou at there

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<sup>22</sup> This point is pointed out by Veneeta Dayal and the example is provided by her.

‘I was surprised to find everyone there’

This may be a potential counterexample to my claim that *dou* is associated with the speaker’s expectation. But in order to account for this, I would like to suggest that the connection between *mei* and *dou* has become grammaticalized.

### 2.6.3 *yixie* ‘some’

We will now consider *yixie* ‘some’ and ask why it doesn’t co-occur with *dou*. I speculate that this is the case if we assume that *yixie* must stay to the left of *henduo* ‘many’ on the implicature scale of Horn (1972). This means that the *yixie* statement never reaches the level of expectation on the part of the speaker as the corresponding *many* statement does. As a result, the presupposition of *dou* is never satisfied in the context of *yixie*.

To start with, I propose that *yixie* is a generalized quantifier built up on a plural individual:

$$(62) \quad \llbracket yixie \text{ ‘some’} \rrbracket = \lambda P \lambda Q \exists Z \exists X [P(X) \ \& \ \forall Y (P(Y) \rightarrow Y \subseteq X) \ \& \ Z \subseteq X \ \& \ Q(Z) \ \& \ |Z| \neq 0]$$

The combination of *yixie* and *dou* in (63) is interpreted as in (64):

- (63)    \**Yixie* /\**Youxie*    haizi    dou    huale    hua.    \**some...dou*  
           some                    kid        dou    draw-ASP picture  
           ‘Some kids drew pictures.’



who have the property in question is 12 or more. However, (64) doesn't impose this requirement. It simply says that the cardinality of the number of kids is not empty. Thus it is open to either of the options below. When the number of kids involved in the context is above 12, the sentence should be felicitous. And when the number of kids involved in this context is below 12, the sentence will be infelicitous.

To deal with the fact that *yixie* is not compatible with *dou*, we have to assume that the first option mentioned above is not available for *yixie*. That is, when the speaker chooses to use *yixie*, he can't mean that the number of kids involved is *henduo* in the context specified above. Following the implicature scale of Horn (1972), this means that *yixie* must stay to the left of *henduo* on the implicature scale as in (65): A sentence with a determiner on the left of the scale is informationally weaker than the one with a determiner on the right of the scale.

(65) *yixie* < *henduo*

Given this, if a speaker chooses to use a weak determiner in his statement, it implicates that a stronger statement with a strong determiner doesn't hold, given Grice's conversational maxims. Applying this to our discussion of *yixie*, it means that when the speaker utters (66), it implicates that the more informative statement in (67) with *henduo* doesn't hold.

(66) Youxie    haizi    huale yifu    hua.  
           some    kid        draw-ASP one-CL    picture

'Some kids drew pictures.'



- (67) Henduo haizi huale yifu hua.  
 many kid draw-ASP one-CL picture  
 ‘Many kids drew pictures.’

This being said, it predicts that *yixie* has the implicature of *not many*. And it is expected that *dou* is not licensed by *not many* either. This is true. (68) shows that *not many* doesn’t co-occur with *dou*.<sup>23</sup> (69) shows that when *dou* is removed, the sentence is fine.

- (68) \* (Huishang) buduode ren dou faleyan. \**not many... dou*  
 (meeting on) not many DE person dou make –ASP speech  
 ‘Not many people made presentations (at the meeting).’

- (69) (Huishang) buduode ren faleyan. *not many*  
 (meeting on) not many DE person make –ASP speech  
 ‘Not many people made a speech (at the meeting).’

Above we assumed that when the speaker uses *yixie*, he tends to negate the truth of the counterpart statement with *many*. That is, the *yixie* statement never reaches the level of expectation on the part of the speaker as the corresponding *many* statement does. But since *dou*’s expectation presupposition is set against that of *many*, it ends up that the presupposition of *dou* is never satisfied in the context of *yixie*. This explains why *yixie* is not compatible with *dou*. And it is not surprising that the *yixie* statement can be modified

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<sup>23</sup> When *henduo* ‘very many’ appears in a negative context, we tend to use *buduo* ‘not many’ instead of *buhenduo* ‘not very many’. That is, the ‘very’ is often omitted.

by *zhiyou* to indicate that the number of individuals that is involved in the context is below one's expectation:

- (70)    Zhiyou    yixie    haizi    huale yifu    hua.  
           only     some     kid       draw-ASP one-CL   picture  
           ‘Only some kids drew pictures.’

## 2.7 More on *zhi* ‘only’

Above we mentioned in passing that the use of *zhi* ‘only’ expresses the converse of *dou* in terms of the presupposed expectation requirement without any explanation. Below we elaborate a bit on it.

### 2.7.1 Interaction of *zhi* with numerals

Taking numerals as a test, we show that *zhi*, like *dou*, also has a sensitivity to the speaker's expectation. Suppose we take the situation in (35) again where 10 students registered for the course and the professor was satisfied with the number of students who registered for the course. In that case, *zhiyou* ‘only’ can't be used:

- (71) a. #Zhiyou 10 ge xuesheng        xuanle        zhemen ke  
           only 10 CL student            sign up ASP    this CL course  
           ‘Only 10 students signed up for the course’
- b. #Zhiyou henduo de    xuesheng    xuanle        zhemen ke  
           only     many    DE    student    sign up ASP    this CL course

‘Only many students signed up for the course’

On the other hand, if we take the same situation as in the case of (35) where 10 students registered but the professor expected to have 20 students in his course, then the use of *zhi* is fine.

(72) a. Zhi you      10 ge xuesheng    xuanle      zhemeng ke  
 only exist   10 CL student    sign up ASP    this CL course

‘Only 10 students signed up for the course’

b. Zhiyou      henshao de    xuesheng    xuanle      zhemeng ke  
 only exist    few      DE    student      sign up ASP    this CL course

‘Only few students signed up for the course’

As indicated above, *zhi* is only felicitously used in a context of *few* or in a context where a number is perceived as *few* by the speaker. This explains the ungrammaticality of its co-occurrence with *dou* as shown below. There are conflicting requirements on the speakers’ expectations imposed by the two expressions:

(73) \* Zhiyou 10 ge xuesheng dou xuanle zhemeng ke \* *only...dou*  
 Only exist 10 CL student dou sign up ASP this CL course

‘Only 10 students signed up for the course’

(74) summarizes the complementary distribution between *zhi* and *dou* in terms of their ability to co-occur with *many* and *few*.



## (76) Modal

Keneng zhi you 10 ge xuesheng xuanle zhemeng ke.

possible only exist 10 CL student sign up ASP this CL course

‘It’s possible that only 10 students have signed up for the course’

## (77) Conditional antecedent:

Ruguo zhi you 10ge xuesheng xuanle zhemeng ke, women jiu

if only exist 10 CL student signup ASP this CL course, we will

zai 110 jiaoshi shangke.

at 110 classroom have class

‘If there are only 10 students who registered for this course, we will have class at room 110.’

## (78) Negation

Zhi you 10 ge xuesheng mei xuan zhemeng ke.

only exist 10 CL student not sign up ASP this CL course

‘Only 10 students didn’t sign up for the course’

All of the sentences above imply that what is asserted is below one’s expectation.

For example, (77) implies that the classroom 110 is a small classroom when *zhi* is used.

And 10 registered for the course is below the speaker’s expectation. (78) implies the fact that 10 (out of 30) didn’t sign up for the course is below the speaker’s expectation. This is the case when the speaker expected that 13 out of 30 would not sign up for the course.

The complementarity we saw in the distribution of *zhi* and *dou* is therefore not surprising.

## 2.8. Conclusion

This chapter has examined the *dou*-(dis)harmony effect in Chinese and provided a solution to it. I ascribed this problem to the presupposition of *dou*. A *dou*-statement is felicitous only when *dou*'s presupposition is met. In particular, I claimed that *dou* has a presupposition that relates the proposition to the speaker's prior expectation. This is evidenced particularly clearly in the contexts of numerals and is shown to be correlated with the context dependency of *henduo* 'many'. The semantics of different quantifiers were discussed along the way, showing that they all fit into the analysis of *dou* once a proper semantics is adopted for those quantifiers. The issue of the optionality of *dou* was also addressed. It was argued that *dou* makes a difference in meaning to the sentence containing it and, in that sense, it is not truly optional. Finally the particle *zhi* was assessed against the analysis of *dou*. It was concluded that *zhi* also displays relevance to the expectation-oriented presupposition. The advantage of the analysis proposed here is that the co-occurrence issue is resolved with the combination of a consistent theory of *dou* and a consistent theory for quantifiers. As we will see in chapter 3, the claimed presupposition of *dou* also plays a role when it appears in structures where focus is crucial to licensing *dou*.

## CHAPTER 3

### DOU IN FOCUS STRUCTURE

#### 3.0 Introduction

In Chapter 2, we saw that *dou*- (dis)harmony poses a problem for the analysis of *dou* that is built on distributivity and plurality, because it is not sufficient to distinguish the *dou*-harmonious quantifiers from those that are not. We proposed to solve this problem by building context sensitivity into the meaning of *dou*. In this chapter, we look at a structure where plurality is not needed to license *dou*. Instead, focus is the crucial licensing factor. In this connection we also look at complex constructions in which *dou* co-occurs with other particles (*lian...dou*) or appears to be substitutable by other particles (*lian...ye*). What is special about these cases is that they have a scalar reading, similar to the reading that *even* has in English.

These data pose the following questions for our analysis of *dou*: How does focus override the plurality requirement? Where does the scalar reading of the sentence come from? These questions have been discussed in the literature, but many of them assimilate scalar and distributive *dou* (for example, Shyu, 1995, Wu, 1999, Portner, 2002). The nature of the properties assumed for *lian...dou/ye* constructions has been relatively less studied. In this chapter, I try to address the following issues surrounding *lian...dou/ye* constructions: Can *dou* freely alternate with *ye*? Is *lian* really optional? Why is *lian*

dependent on *dou/ye*? Answers to these questions lead me to conclude that *dou* in this context requires a separate account from that of distributive *dou*.

This chapter is organized as follows. Section 3.1 presents the basic data and traditional observations about them. Section 3.2 identifies the sources of the scalarity in *dou* and in *lian*. Section 3.3 introduces focus semantics and the semantics of *even* we will adopt in this chapter and provides the semantic contributions of *dou*, *lian* and *ye*. Section 3.4 discusses some of the implications of the analysis. We address four issues. First, is *dou* ambiguous? Second, is redundancy a problem assuming that both *lian* and *dou* introduce scalarity? Third, why is *lian* dependent on *dou/ye*? Fourth, what is the relation between *ye* and scalarity? Section 3.5 focuses on *lian...dou/ye* in negative contexts. Section 3.6 compares the proposed analysis with two other approaches. Section 3.7 concludes the chapter.

### 3.1 The core facts

We know that *dou* as a distributive operator goes with a plural NP but not with a singular NP, as in the examples below<sup>24</sup>.

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<sup>24</sup> But plurality is neither sufficient nor necessary to license *dou*. As we saw in chapter 2, a quantifier phrase such as *yixie*-NP ‘some’ doesn’t go with *dou* even if it is plural, as shown in (i)

- (i) \**Youxie haizi dou hua le yifuhua.*  
 some kid dou draw –ASP one-CL picture  
 ‘Some kids drew a picture.’

In addition, as has been noticed by Lin (1998), Wu (1999), etc., *dou* is perfect with a singular NP, as in (ii), because the predicate *reading* may be said to hold of each salient part of a book: pages, units, chapters etc. This contrasts with (iii) where the use of *dou* is bad, because you



- (1) [John he Mary] dou hua le yifuhua.  
 John and Mary dou draw –ASP one-CL picture  
 (i) ‘John and Mary each drew a picture.’  
 (ii) \* ‘John and Mary together drew a picture.’
- (2) \*[John] dou hua le yifuhua.  
 John dou draw –ASP one-CL picture  
 ‘John drew a picture.’

In sharp contrast to (2), a singular NP, when focused, is fully acceptable with *dou*, as shown in (3). Interestingly, the combination of focus and *dou* leads to a scalar reading, similar to English sentences with *even*.<sup>25</sup> For instance, (3) may be uttered by a preschool teacher expressing her surprise about John’s drawing a picture, given that John has never been cooperative in doing what the teacher has told him to do.

- (3) [John ]<sub>f</sub> dou hua le yifuhua.  
 John dou draw –ASP one-CL picture  
 ‘Even John drew a picture.’

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normally buy a book as a whole but not any part of it. In other words, there are no contextually plausible parts for *dou* to quantify over.

- (ii) Zheben shu, ta dou dule  
 this-CL book, he dou read-ASP  
 ‘He has read all of the book.’
- (iii) \* Zheben shu, ta dou maile  
 this-CL book, he dou buy-ASP  
 ‘He has bought this book.’

We will talk about the ambiguity of (ii) in 3.4.1.

<sup>25</sup> We will focus for now on NPs in the subject position. NPs in object position will be addressed in 3.4.3.

An interesting question arises about the effect of focus on plural NPs. That is, do we have both scalar and distributive readings in (4)?<sup>26</sup>

- (4) [John he Mary]<sub>f</sub>        dou    hua    le        yifuhua.  
       John     and Mary        dou    draw –ASP   one-CL picture  
       ‘Even John and Mary drew a picture.’

Instead of the distributive reading associated with the quantificational *dou* studied in chapter 2, we get the collective reading that is otherwise unavailable (cf. 1ii). That is, (4) has the interpretation that even John and Mary together drew a picture. In fact, it is the most salient reading for (4). We are led to conclude; therefore, that focus-*dou* is distinct from the distributive operator.

Let us consider two structures with which focus-*dou* is closely aligned. *Dou* with a scalar reading has generally been taken to involve the ‘(*lian*)...*dou*’ ‘even...*dou*’ construction with a silent *lian*, according to Chinese traditional grammars. For example, (3) and (4) are assumed to be (5) and (6) respectively:

- (5) (Lian ) [John ]<sub>f</sub>        dou    hua    le        yifuhua.  
       even     John        dou    draw –ASP   one-CL picture  
       ‘Even John drew a picture.’
- (6) (Lian) [John he Mary]<sub>f</sub>        dou    hua    le        yifuhua.  
       even    John     and Mary        dou    draw –ASP   one-CL picture  
       ‘Even John and Mary drew a picture.’

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<sup>26</sup> We will talk a bit more on potential readings associated with *dou* in 3.4.1.

A well-known feature about this structure is that *dou* may be replaced by *ye* ‘also’ without changing the meaning of the sentences. This is shown in (7) and (8):

- (7) (Lian ) [John ]<sub>f</sub>            dou/ye      hua le            yifuhua.  
 even     John                dou / also    draw –ASP      one-CL picture  
 ‘Even John drew a picture.’

- (8) (Lian) [ John he Mary]<sub>f</sub>            dou/ ye      hua le            yifuhua.  
 even    John     and Mary                dou/ also    draw –ASP    one-CL picture  
 ‘Even John and Mary drew a picture.’

Note that this is different from distributive *dou*, which can’t be replaced by *ye* without affecting the meaning of the sentence. For example, *dou* in (9) has the distributive reading, but its counterpart with *ye* in (10) has a collective reading along with the reading that someone other than John and Mary drew a picture, what we will refer to as the *also* reading.

- (9) John he Mary            dou hua le            yifuhua.  
 John     and Mary            dou draw –ASP    one-CL picture  
 ‘John and Mary each drew a picture.’

- (10) John he Mary            ye hua le            yifuhua.  
 John     and Mary            also draw –ASP    one-CL picture  
 ‘John and Mary also drew a picture.’

Finally, when *lian* is overtly present, *dou* or *ye* has to be present, as shown in (11)

and (12). This is in parallel to what we have seen in connection with *mei*-NP and quantificational *dou*, as illustrated in (13).

(11) Lian [John]<sub>f</sub> \*(dou/ ye) hua le yifuhua.  
 even John dou / also draw –ASP one-CL picture  
 ‘Even John drew a picture.’

(12) Lian [John he Mary]<sub>f</sub> \*(dou/ ye) hua le yifuhua.  
 even John and Mary dou/ also draw –ASP one-CL picture  
 ‘Even John and Mary drew a picture.’

(13) Meige haizi \*(dou) huale yifuhua  
 Every-CL kid dou draw-ASP one-CL picture  
 ‘Every kid drew a picture.’

In the rest of the chapter, I will probe the various issues raised by the facts I have discussed here. I will start by taking a closer look at the contribution of the various particles and the scalarity observed in sentences with focus and *dou*.

### 3.2 The sources of the scalar reading

In this section, we address the question of where the scalarity of *lian...dou/ye* comes from and how it is handled. We claim that it comes from two sources: from *dou* and from *lian*. The scalarity of *dou* can be seen by comparing it with *ye* and the scalarity of *lian* can be identified by comparing *ye* with *lian...ye*. In addition, it is suggested that the scalarity of *dou* comes from its presupposition that makes reference to the speaker’s

expectation. The scalarity of *lian*, on the other hand, is suggested to be inherent, in the way that the scalarity is inherent in the meaning of English *even*.<sup>27</sup> Below we discuss the scalarity of *dou* first, followed by discussion of *lian*.

### 3.2.1 The scalar reading of *dou*

The scalar reading of *dou* is seen clearly in the examples below, where *lian* is absent. In (14) and (15), the object *problem 2* is preposed before *dou* and *ye* in order to be focused.<sup>28</sup>

(14) John        [di'er ti]<sub>f</sub>        dou    zuochulai le.  
        John        2<sup>nd</sup> problem        dou    figure out ASP  
        'John solved even problem 2.'

(15) John        [di'er ti]<sub>f</sub>        ye    zuochulai le.  
        John        2<sup>nd</sup> problem        also   figure out ASP  
        'John solved also problem 2.'

(14) with *dou* minus *lian* has the *even* meaning: John's solving problem 2 is less likely or less expected. In other words, problem 2 is considered difficult. But (15) with *ye* minus *lian* has the *also* meaning without implicating whether the problem is difficult or

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<sup>27</sup> According to Karttunen and Peters (1979), *even* is associated with two presuppositions: scalarity and existentiality. We will introduce the differences between the two readings in section 3.3.1 when we discuss the semantics of *even*. But in the following discussion of *dou*, *lian* and *ye*, I use the terms scalarity and existentiality in the sense of Karttunen and Peters (1979).

<sup>28</sup> Object preposing in Chinese is considered as a case of focalization in the literature. See Shyu (1995) and Zhang (1997) for detailed discussions about it.

not.<sup>29</sup> Suppose the alternative problems to problem 2 are problem 1, 3, and 5, then (15) holds as long as John also solved problem 1 or problem 3 or problem 5, but this is not the case for (14). For (14) to be felicitous, problem 2 has to be a difficult problem with respect to the alternatives to it. In other words, *dou* in (14) invokes a ranking between the NP in focus and its alternatives but *ye* in (15) doesn't.

The above contrast between *dou* and *ye* is corroborated by the fact below. When a scale is explicitly expressed between *problem 2* and *problem 5* such that the imposed ranking is destroyed, as in A in (16), (14) becomes inappropriate as an answer. But (15) with *ye* is acceptable. This is because the latter is felicitous as long as there is at least one alternative that is true in the context without imposing any order between the NP in focus and its alternatives.

(16) A: John solved problem 5, which was the most difficult problem. Did he solve problem 2?

B: (14)<sup>BAD</sup>/ (15)<sup>OK</sup>

In addition, the claimed *dou/ye* contrast resembles that of *even/also*. As discussed in Rullmann (1997), who gives credit to Horn (1972), the replacement of *even* by *also* in B's answer in (17) leads to the infelicity of the sentence.

(17) A: Is Claire an [assistant]<sub>f</sub> professor?

. B: Assistant professor? She is *even*/ \**also* an [associate]<sub>f</sub> professor!

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<sup>29</sup> There are cases where *ye* statements do have scalar readings. We will discuss them in 3.4.4.

According to him, this is because *also* carries an existential presupposition which is either in conflict with the asserted content of the sentence or with our knowledge of the world. For instance, the answer in B with *also* would presuppose that Claire is an associate professor in addition to being an assistant professor, which is in conflict with our knowledge of the academic profession. In contrast, the felicity of *even* in this context shows that *even* doesn't commit us to the sort of existentiality claimed to hold for *also*.

Turning to Chinese, the corresponding sentence with *dou* is good but the sentence with *ye* is not.

(18) A. Is Claire an [assistant]<sub>f</sub> professor?

B. Zhuli      jiaoshou? ta      [fu]<sub>f</sub>      jiaoshou      <sup>OK</sup>dou/ \* ye shi le.

assistant      professor? she associate professor dou/also be ASP

This shows that independently of *lian*, *dou* is scalar but *ye* is not. The *dou*-statement imposes an order or a scale between the NP in focus and its alternatives; the *ye*-statement introduces only existentiality. This explains their contrasting behavior in (16) and (18) above. In (16), when the required scale for the *dou*-statement doesn't exist any more, the *dou* sentence becomes odd, but the *ye* sentence is acceptable. On the other hand, in (18), when the existential interpretation conflicts with our world knowledge, the *ye* statement becomes odd but the *dou* statement is good.

### 3.2.2 The scalar reading of *lian*

As mentioned in 3.1, *lian* has been claimed to be an optional element in

obtaining a scalar reading for a sentence containing *dou* or *ye*. Below I present two arguments to argue against this claim.

First, the *dou/ye* difference with respect to scalarity in (16) disappears with the addition of *lian*. In particular, while the *ye* statement in B's answer in (16) is felicitous in a context that doesn't support the expected scalarity, this is no longer the case when *lian* is added to it. As shown in (19), the addition of *lian* forces a scalar reading for the sentence, making the *ye* statement similar to the *dou* statement with respect to scalarity. As a result, it is no longer a felicitous answer to (16), as shown in (20).

- (19) John      *lian*      [di'er    ti]<sub>f</sub>              *ye*      zuochulai le.  
        John      even      2<sup>nd</sup> problem              also      figure out ASP  
        'John solved even problem 2.'

- (20) A: John solved problem 5, which was most difficult. Did he solve problem 2?  
        B: \*(19)

The above contrast between the *ye* statement and the *lian...ye* statement indicates that *lian* is the source of scalarity. It implies that *lian* is not fully optional as has been commonly assumed, because otherwise the above difference between *ye* and *lian...ye* would be unexpected.

On the other hand, the *dou/ye* difference with respect to existentiality in (18) still exists when *lian* is added to them.



(21) A. Is Claire an [assistant]<sub>f</sub> professor?

B. Zhuli      jiaoshou? ta      lian [fu]<sub>f</sub>      jiaoshou      <sup>OK</sup>dou / \* ye shi le.  
 assistant    professor?    she even      associate professor dou/also be ASP

In (21), the statement with *lian...dou* is good but the one with *lian...ye* is bad. Given that *lian* is scalar, the infelicity of *lian...ye* indicates that the existentiality claimed to be part of the meaning of *ye* is still there. That is, *lian* + *ye* has both scalarity and existentiality. In contrast, the felicity of *lian...dou* suggests that existentiality is not involved there. That is, the combination of *lian* with *dou* doesn't introduce the existential meaning. As mentioned earlier, the *even/also* difference in English led Rullmann to claim that *even* has only the scalar presupposition but not the existential one. Given the behavior of *lian...dou* and *lian...ye* in this context (the former doesn't have the existential reading but the latter does) and the scalarity of *lian*, I will follow Rullmann in assuming that *lian*, like *even*, has only the scalar presupposition but not the existential one.<sup>30</sup>

To reiterate, *lian* is the source of scalarity, as shown by *lian...ye* and *lian* doesn't involve the existential presupposition, as shown by *lian...dou*. In addition, *lian...dou* is not identical to *lian...ye*. The former has only scalarity, while the latter has both scalarity and existentiality. Below we provide further evidence to support these claims.

First, that *lian* is like *even* is indirectly supported by *lihn* 'include' in Cantonese. As discussed in Shank (2004), Cantonese *dou*, as in (22), can mean either 'also' or 'even'.

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<sup>30</sup> As we will see shortly, this differs from the analysis of *even* in Karttunen and Peters (1979), which assumes that *even* has both scalarity and existentiality.

But the two readings can be disambiguated by using *lihn* before the focused item, as in (23), where *lihn* forces the scalar *even* reading.<sup>31</sup>

(22) Ngoh a-John dou jin-jo

I par-John also see-pfv

(i) I even saw John

(ii) I saw John too.

(23) Ngoh lihn [ a-John ]<sub>f</sub> dou jin-jo

I include par-John also see-pfv

(i) I even saw John

(ii) \*I saw John too.

The differences between Cantonese and Mandarin are illustrated in (24). While Cantonese *dou* is ambiguous between the existential and the scalar reading, Mandarin *dou* is not. It is always scalar and it is lexically distinct from the non-scalar *ye*. In addition, in Cantonese, the use of *lihn* may disambiguate the two readings of *dou*, Mandarin *lian* forces a scalar reading for the *ye* statement.<sup>32</sup>

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<sup>31</sup> Mandarin *lian* also means ‘include’ when used as a verb. For example,

(i) Lian John yigong 10 ge ren  
 Include John, total 10-CL person  
 ‘There are 10 people including John.’

<sup>32</sup> It is not clear for me whether existentiality stays in *lihn...dou* in Cantonese. From what I know about Mandarin *dou*, however, I would not expect Cantonese *dou* to appear in the assistant/associate professor example if as claimed by Shank, it always carries an existential presupposition. However, if *lihn...dou* is acceptable in the above context, it implies that existentiality is not involved.

(24) Cantonese *dou* vs. Mandarin *dou*

Cantonese	Mandarin
$\left. \begin{array}{l} \\ \end{array} \right\} \begin{array}{l} \text{scalar} \\ \\ \text{existential} \end{array}$ <i>dou</i>	<i>dou</i> == > scalar <i>ye</i> == > existential
<i>lihn</i> + <i>dou</i> ==> scalar	<i>lian</i> + <i>dou</i> == > scalar <i>lian</i> + <i>ye</i> == > scalar + existential

Based on *dou* in Cantonese, Shank suggests that *dou* in Cantonese always carries an existential presupposition but does not necessarily carry a scalar presupposition. However in discourses in which a scale is salient, *dou* may additionally have a scalar presupposition. Alternatively, when the *even* reading emerges, there is an unpronounced *lihn* present in the sentence. This is to say, in Cantonese, it is *lihn* that provides the scalarity for the *dou* statement. Given the difference between *dou* and *ye* in Mandarin Chinese, this seems to support our view that it is *lian* that provides the scalarity to *ye* in Mandarin Chinese.

Having compared the scalarity of *lian* with its counterpart *lihn* in Cantonese, we use the following example to support our claim about the difference between *lian...dou* and *lian...ye*.<sup>33</sup> As we discussed earlier, (25) with either *lian...dou* or *lian...ye* has the

<sup>33</sup> This potential difference between *lian...dou* and *lian...ye* here is brought to my attention by Veneeta Dayal.

scalar reading. But in a situation where there are only two problems that are under consideration, the continuation that *John didn't solve the other problem* is ok with the *lian...dou* statement but not with the *lian...ye* statement.

(25) John lian [di'er ti] dou /ye zuo chulaile lian...dou/ lian...ye

John lian problem 2 dou /also figure out ASP.

'John solved even problem 2'

(26) John lian [di'er ti] dou / \* ye zuo chulaile. lian...dou/ \*lian...ye

Buguo ta mei zuochulai lingyidao.

but he not work out another one-CL

But he didn't solve the other problem.'

(26) with *lian...dou* conveys the idea that John is a careless type of person. He solved the difficult problem, but failed to work out the less difficult one. In this context, *lian...ye* is not felicitous. This is because *ye* has the existential presupposition that requires that there be at least one alternative that is true in addition to the proposition that John solved problem 2. Since the only available alternative is denied in the second conjunct, the *lian...ye* statement becomes infelicitous.

So far we have shown that the scalar reading in *lian...dou/ye* might come from either *dou* or *lian* and that the scalarity of the latter is inherent to its meaning much as scalarity is inherent to the meaning of *even*. We also showed the difference between *lian...dou* and *lian...ye*. What we haven't addressed, though, is where the scalarity of *dou* comes from. We turn to this topic in the next section.

### 3.2.3 The source of the scalarity of *dou*

In this section, I discuss the scalarity of *dou*. I suggest that the scalarity of *dou* comes from the presupposition of low expectation as developed in chapter 2 for quantified statements.

In chapter 2, to account for the *dou* (dis)harmony effect such as that in (27), I proposed that *dou* has a presupposition relative to the speaker's expectation. That is, *dou* is felicitously used only when the assertion of the sentence meets or exceeds the speaker's expectation about the predication. As a result, the (dis)harmony in (27) follows from the match or mismatch between the presupposition of *dou* and the semantics of the quantifier concerned. This is repeated in (28) and (29), where  $dou^{p \geq n}$  stands for the presupposition of *dou*.<sup>34</sup>

(27) *many NP...dou/ \*few NP...dou*

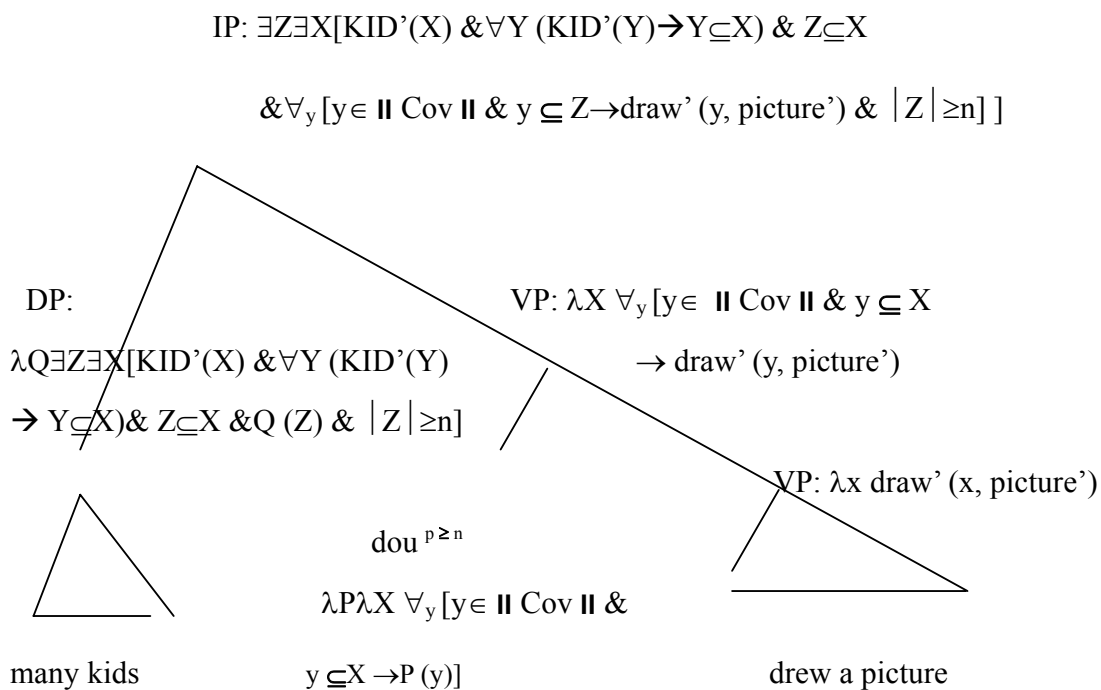
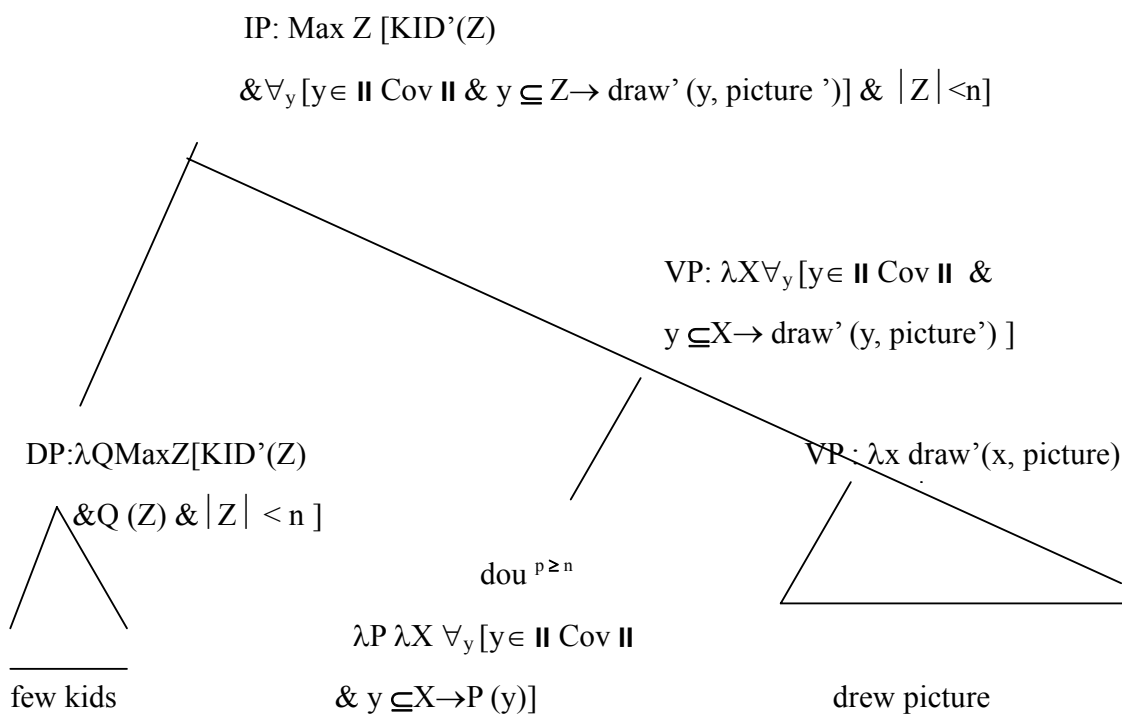
Henduode / \*Henshaode haizi dou huale hua

many /few kid dou draw-ASP picture

'Many / Few kids drew a picture.'

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<sup>34</sup>  $dou^{p \geq n}$  stands for the following: (a) An assertion that the number of individuals denoted by the common noun with the property denoted by the verb phrase is equal to or greater than n. (b) A presupposition that the speaker expected that the number of individuals denoted by the common noun with the property denoted by the verb phrase would be less than or equal to n.

(28) *many...dou*(29) \**few...dou*

In (28), the semantics of *many* requires that the cardinality of the set of kids who drew a picture is equal to or above the speaker's expectation. So suppose 12 out of 20 kids meets the speaker's expectation, (28) is true when the cardinality of the plurality is 12 or above. This high expectation requirement of *many* matches well with that of *dou*, because in the assertion of the proposition with *dou*, the speaker's expectation must have been met or exceeded. In other words, the felicity of the *dou* statement in this context entails that the speaker had a low expectation about the number of the kids who have the relevant property.

However, in (29), the semantics of *few* clashes with the presupposition of *dou* with respect to the speaker's expectation. In particular, the semantics of *few* requires that the cardinality of Max  $Z$  should be smaller than the expectation  $n$ . In the context set above, this means that the number of kids who drew a picture should be below 12. But this is in conflict with the presupposition of *dou*, which requires that the number of kids be 12 or above in this context. Therefore, *dou* and *few* cannot co-occur because *dou* is undefined.

Against this background, now we turn back to *dou* in *lian...dou* constructions and see if the scalarity of *dou* can be handled along the same lines.

As discussed above, (30) implies that John's solving problem 2 is not expected. Concretely, if there are two alternative problems, problem 3 and 4 in this context, (30) is felicitous only when problem 2 is a problem that is more difficult than its alternative problems. Assuming *dou* here also has the expectation-oriented presupposition, this

means that the assertion of the proposition with *dou* exceeds the expectation of the speaker. If the expectation is a proposition that makes reference to the alternative set such as that in (31), then *dou* has the presupposition that relates the proposition to the speaker's prior expectation by separating the set into two subsets, those that exceed the expectation and those that fall below.<sup>35</sup> In other words, (30) entails that the speaker had expected that John might solve problem 3 or problem 4.<sup>36, 37</sup>

- (30) John (lian) [di'er ti]<sub>f</sub> dou zuochulai le.  
 John even 2<sup>nd</sup> problem dou figure out ASP

<sup>35</sup> The alternative semantics of focus will be introduced in the next section.

<sup>36</sup> The claimed implication is also available in the negative context, as shown in (i). It asserts that John didn't solve problem 2. The use of *dou* expresses that the assertion exceeds the speaker's expectation. That is, the speaker had expected that John would not solve problem 3 or problem 4.

- (i) a. John [di'er ti]<sub>f</sub> dou mei zuochulai le.  
 John 2<sup>nd</sup> problem dou not figure out ASP  
 'John even didn't solve problem 2.'  
 b. { John didn't solve problem 2, John didn't solve problem 3, John didn't solve problem 4 }

In addition, it is impossible to put the negation *mei* in front of *dou*, just as in the case of *dou* in quantified statements, as mentioned in section 2.4.1 in chapter 2. This is shown in (ii) and (iii) below.

- (ii) \* John [di'er ti]<sub>f</sub> mei dou zuochulai le. \* [not...dou]  
 John 2<sup>nd</sup> problem not dou figure out ASP  
 Intended: 'John even didn't solve problem 2.'  
 (iii) \* You 10 ge xuesheng mei dou xuan zheminke \* [not...dou]  
 exist 10 CL student not dou choose this CL course  
 Intended: 'There are 10 students who didn't sign up for the course.'

We will discuss more of interaction between *dou* and negation in 3.5.

<sup>37</sup> Like it is in the positive sentence, *ye* in this context doesn't have the scalar reading either:

- (i) John [di'er ti]<sub>f</sub> ye mei zuochulai le.  
 John 2<sup>nd</sup> problem also not figure out ASP  
 'John didn't solve problem 2, either.'



‘John solved even problem 2.’

(31) { John solved problem 2, John solved problem 3, John solved problem 4 }

Thus an analogy can be drawn between *dou* in quantified statements and *dou* in *lian...dou* if we assume that the speaker’s expectation for the latter can be established through the alternative propositions induced by focus.

Having identified the functions of *dou*, *ye* and *lian*, our goal next is to provide a compositional semantics for them. 3.3.1 briefly introduces focus semantics and the semantics for *even* on which we build our analysis. 3.3.2 shows how the particles are combined. 3.3.3 sums up the section.

### 3.3 Combining focus sensitive particles

#### 3.3.1 Background on focus semantics

In the alternative semantics of Rooth (1985, 1992), focus expresses a semantic value  $\llbracket \alpha \rrbracket^f$  in addition to its ordinary semantic value  $\llbracket \alpha \rrbracket^0$ . The former is a set of propositions from which the ordinary semantic value is drawn. For example, the ordinary semantic values for the two sentences in (32) are the same: *Mary like Sue*, the proposition that denotes the set of worlds in which Mary likes Sue. However, the focus semantic values for them are different depending on whether the focus is on *Mary* or on *Sue*.

- (32) a.  $[Mary]_f$  likes Sue.  
 b. Mary likes  $[Sue]_f$

The focus semantic value for (32a) is the set of propositions of the form ‘x likes Sue’, while the focus semantic value for (32b) is the set of propositions of the form ‘Mary likes y’. Suppose the domain of individuals includes Mary, Linda, Sue, and Lisa, the alternative propositions for the above sentences may be the following:

- (33) a.  $\llbracket [\text{Mary}]_f \text{ likes Sue} \rrbracket^f = \{\text{Mary likes Sue, Linda likes Sue, Lisa likes Sue}\}$   
 b.  $\llbracket \text{Mary likes } [\text{Sue}]_f \rrbracket^f = \{\text{Mary likes Sue, Mary likes Linda, Mary likes Lisa}\}$

The scalar particle *even* shows association with focus. According to Karttunen and Peters (1979) & Rooth (1985), among others, *even* doesn’t affect the truth condition of the sentences in which it appears, but it introduces presuppositions that bear on the semantic value expressed by focus. Specifically, it expresses a relation between the truth-conditional content of the sentence and the focus semantic value of the sentence. For example, for both sentences in (34), the truth conditional content or the assertion is (35). What *even* contributes to each sentence are presuppositions that relate the assertion to the focus semantic values. What this means is that the role of *even* in (34a) is to relate the assertion to the set of propositions in (33a) and that of *even* in (34b) is to relate the assertion to the set of propositions in (33b).

- (34) a. Even  $[\text{Mary}]_f$  likes Sue.  
 b. Mary likes even  $[\text{Sue}]_f$   
 (35) Mary likes Sue.

As mentioned earlier, Karttunen and Peters (1979) assumes that *even* builds in

existentiality and scalarity. The former requires that at least one of the alternative propositions other than the assertion be true, and the latter requires that the assertion is the least likely among all of the alternative propositions. This is done in (36), where *even* quantifies over propositions that are restricted by the context variable C (Rooth 1985, Wilkinson, 1996):

- (36) a. Existentiality:  $\exists p [C(p) \ \& \ \vee p \ \& \ p \neq a]$   
 b. Scalarity:  $\forall p [[C(p) \ \& \ p \neq a] \rightarrow \text{likelihood}'(p) > \text{likelihood}'(a)]$

The existential implicature in (36a) says that there is some proposition *p* that is restricted by *C*, which is true, and it is distinct from the assertion *a*. The scalar implicature in (36b) says that for all true propositions of the form *p* that are restricted by *C* and they are distinct from the assertion *a*, the likelihood of *p* exceeds that of *a*. Under this view, the presuppositions of *even* in (34a), for example, are as follows:

- (37) a. Existential presupposition:  
 $\exists p [\exists x [p = \text{like}'(x, \text{Sue}) \ \& \ \vee p \ \& \ p \neq \text{like}'(\text{Mary}, \text{Sue})]]$   
 b. Scalar presupposition:  
 $\forall p [\exists x [[p = \text{like}'(x, \text{Sue}) \ \& \ p \neq \text{like}'(\text{Mary}, \text{Sue})] \rightarrow \text{likelihood}'(p) > \text{likelihood}'(\text{like}'(\text{Mary}, \text{Sue}))]]$

In (37), (a) says that a proposition of the form *x likes Sue* is true and it is not identical to the assertion *Mary likes Sue*. (b) says that for all true alternative propositions in the form of *x likes Sue*, which are distinct from the assertion, they are more likely than the

assertion *Mary likes Sue*. This amounts to saying that *Mary likes Sue* is the least likely among all the alternative propositions.<sup>38</sup>

Having introduced focus semantics and the semantics of *even*, below we show how the particles in Chinese are combined following this approach.

### 3.3.2 Combining the particles

Recall that in 3.2 we made the following claims. First, both *dou* and *lian* are scalar and *ye* is existential. Second, following Rullmann, we claimed that *lian* has only the scalar presupposition but not the existential one. Third, the scalarity of *dou* was assumed to come from its expectation-oriented presupposition. Here I propose to represent the claimed presuppositions of *lian*, *dou* and *ye* as follows:

(38) a. The scalar presupposition<sup>lian</sup>

$$\forall q [ [C(q) \ \& \ q \neq p] \rightarrow q \text{ >likely } p ]$$

b. The existential presupposition<sup>ye</sup>

$$\exists q [ C(q) \ \& \ q \neq p ]$$

c. The scalar presupposition<sup>dou</sup>

$$\forall q [ [C(q) \ \& \ q \neq p] \rightarrow p \text{ >speaker-expectation } q ]$$

The presuppositions of *lian* and *ye* in (38a) and (38b) are identical to the scalar presupposition and the existential presupposition of *even* respectively. The former

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<sup>38</sup> I do not typically use  $\wedge$  in representing focus semantic values in the text but the reader should keep in mind that propositions of type  $\langle s, t \rangle$  are intended.

imposes a scalar relationship between the assertion and the alternative propositions. The latter requires that there be another true alternative that is distinct from the assertion. The presupposition of *dou* in (38c) says that for all true propositions of the form  $q$  that are restricted by  $C$ , which are distinct from the assertion, the assertion exceeds the speaker's expectation  $q$ .

Below we show how *lian...dou* and *lian...ye* are combined in this approach. We look at *dou/lian...dou* first in 3.3.2.1 and then *ye/lian...ye* in 3.3.2.2.

### 3.3.2.1 *dou/lian...dou*

First, we look at a case with *dou* in (39). According to the discussions in 3.3.1, (39) may have the ordinary semantic value and focus semantic value in (40a) and (40b) respectively. We assume there are only two alternative problems, problem 3 and problem 4, in this context.

(39) John [di'erti]<sub>f</sub> dou zuochulaile [NP<sub>f</sub> + *dou*]

‘John solved even problem 2.’

(40) a.  $\llbracket \text{John [di'erti]}_f \text{ dou zuochulaile} \rrbracket^0 = \text{John solved problem 2}$

b.  $\llbracket \text{John [di'erti]}_f \text{ dou zuochulaile} \rrbracket^f = \{ \text{John solved problem 2, John solved problem 3, John solved problem 4} \}$

What *dou* introduces to the sentence will be the presupposition in (41) that relates the above ordinary semantic value to the focus semantic value via the expectation of the speaker:



c. The scalar presupposition<sup>dou</sup>

$$\forall q [[ C(q) \ \& \ q \neq p ] \rightarrow p >_{\text{speaker-expectation}} q ]]$$

d. The scalar presupposition<sup>lian</sup>

$$\forall q [[ C(q) \ \& \ q \neq p ] \rightarrow q >_{\text{likely}} p ]]$$

Even though the *dou* statement and the *lian...dou* statement are logically distinct, their meanings converge in a way that gives the effect of optionality.

### 3.3.2.2 *ye / lian...ye.*

Now we look at the cases with *ye* and *lian...ye*. In (44) with *ye*, the assertion and the alternative propositions are the same as the previous sentences with *dou*. The difference is the presupposition *ye* introduces to the sentence in (45c), which requires that there be a true statement that is not identical to the assertion. That is, (45c) is satisfied as long as there is another true statement that is not identical to *John solved problem 2*. Thus the *ye*-statement carries only the existential meaning but not the scalar meaning, as we have previously discussed.

(44) John [di'erti]<sub>f</sub> ye zuochulaile [ NP<sub>f</sub>+ye ]

‘John solved also problem 2.’

(45) a. [[ John [di'erti]<sub>f</sub> ye zuochulaile ]]<sup>0</sup> = John solved problem 2

b. [[ John [di'erti]<sub>f</sub> ye zuochulaile ]]<sup>f</sup> = { John solved problem 2, John solved problem 3, John solved problem 4 }

c. The existential presupposition<sup>ye</sup>

$$\exists q [C(q) \& \forall q \& q \neq p]$$

Now we look at *lian...ye* in (46). As seen in (47), the *lian...ye* statement differs from the *ye* statement in the added presupposition of *lian* in (47d). As explained earlier, *lian* introduces a scalar presupposition that ranks the assertion *John solved problem 2* as the least likely among all alternative propositions. Thus the combination of *lian* and *ye* gives the sentence both scalar and existential meanings.

(46) John *lian* [di'erti]<sub>f</sub> ye zuochulaile [ *lian* NP<sub>f</sub>+ye]

‘John solved even problem 2.’

- (47) a.  $\llbracket \text{John } \textit{lian} \text{ [di'erti]}_f \text{ ye zuochulaile} \rrbracket^0 = \text{John solved problem 2}$
- b.  $\llbracket \text{John } \textit{lian} \text{ [di'erti]}_f \text{ ye zuochulaile} \rrbracket^f = \{\text{John solved problem 2, John solved problem 3, John solved problem 4}\}$
- c. The existential presupposition <sup>ye</sup>
- $$\exists q [C(q) \& \forall q \& q \neq p]$$
- d. The scalar presupposition <sup>lian</sup>
- $$\forall q \llbracket [C(q) \& q \neq p] \rightarrow q \text{ >likely } p \rrbracket$$

Thus unlike *dou* and *lian...dou* which may converge in a way to give the effect of optionality of *lian*, this doesn't happen for *ye* and *lian...ye*.

### 3.3.3 Conclusion

In this section, we introduced focus semantics and showed how the particles are combined in this approach. In particular, we showed that the *dou* statement has the scalar



reading but the *ye* statement has only the existential meaning. We also showed that although both *dou* and *lian* introduce scalarity, their meanings are compatible with each other.

The advantage of packaging meaning this way is that it enabled us to capture the differences and similarities between *dou* and *ye* on the one hand and *lian...dou* and *lian...ye* on the other. For instance, in the assistant/associate professor example, repeated below, *dou* merely indicates what the speaker's expectations were about the alternative propositions, not about the alternatives being true. *Ye*, on the other hand, has precisely this implicature, leading to the contrast observed.

(48) A. 'Is John an assistant professor?'

B. Zhuli      jiaoshou?    ta lian    [fu]<sub>f</sub>      jiaoshou    <sup>ok</sup>dou / \*ye shi le.  
 assistant    professor?    he lian    associate professor dou/also be ASP  
 'Assistant professor? He is even an [associate]<sub>f</sub> professor.'

In addition, it enabled us to derive the meanings of *lian...dou* and *lian...ye* from each piece whose semantics can be independently motivated.

In the rest of the chapter, we will consider some further issues this analysis leads us to. In 3.4, some of the implications of the analysis are discussed. 3.5 address issues raised by negative contexts for our analysis of *lian...dou/ye*. 3.6 introduces two previous approaches to scalar *dou*. 3.7 concludes the chapter.

### 3.4 Some implications of the analysis

In this section, we address some further questions raised by this analysis. We focus on the following four. First, we have claimed here that *dou* is scalar, which implies *dou* is ambiguous between the scalar reading and the distributive reading seen in quantificational contexts. But we would like to see if there is any independent evidence for this claim. Second, since we claimed that both *lian* and *dou* introduce scalarity, we might wonder if there is a problem with redundancy. Third, since we likened *lian* to *even*, we might ask why it requires *dou* or *ye* to be grammatical. Put differently, why is it dependent on *dou/ye*? Fourth, is it possible for *ye* to get the scalar meaning? If so, when? Below we attempt to answer these questions in order. 3.4.1 provides evidence to support the ambiguity view of *dou*. 3.4.2 addresses the potential redundancy problem. 3.4.3 explains why *lian* requires *dou* or *ye* in Chinese. 3.4.4 discusses *ye*- statements that seem to have the scalar readings. 3.4.5 is the summary.

### 3.4.1 Arguments for two *dou*'s

The analysis we have proposed for focus *dou* clearly rests on the view that there are two distinct *dou*'s in Chinese, both connected by an expectation-oriented presupposition. Below we provide empirical evidence to support this view. We show that a sentence with *dou* can be ambiguous between the scalar reading and the distributive reading whether it involves a singular NP or a plural NP. Then, I present some more arguments from the literature for separating the two *dou*'s.

First, (49) with a singular NP is ambiguous depending on whether *dou* is stressed

or not. When *dou* is stressed, we get the distributive reading and when *dou* is not stressed, we get the scalar reading.<sup>39</sup>

(49) Zheben shu, ta dou dule  
this-CL book, he dou read-ASP

(i) ‘He has read all of this book.’ - Distributive, *dou*<sup>stressed</sup>

(ii) ‘He has read even this book.’ -Scalar, *dou*<sup>unstressed</sup>

When *lian* is added, the scalar reading is salient but the distributive reading is not.

(50) Lian [zheben shu]<sub>f</sub>, ta dou kanle  
even this-CL book, he dou see-ASP

(i) ‘He has read even this book.’

(ii) ? ‘He has read all of the book.’

The difference between (49) with a stressed *dou* and (50) with *lian...dou* can be seen in (51), where a stressed *dou* is not ok with the continuation ‘but he hasn’t finished it’, but an unstressed *dou* is. In other words, the distributivity in the former cannot be cancelled but the distributivity in the latter can. Thus if *dou* in (50) involves a distributive

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<sup>39</sup> The fact that *dou* shows differing stress patterns in different structures is not a new observation. For example, Hole (2004) cited the following from Sybesma (1996), claiming that distributive *dou* in (i) must bear stress and scalar *dou* in (ii) can’t bear stress. But they didn’t discuss ambiguity of *dou* in a sentence or a sentence with a singular NP.

(i) Tamen dou<sup>stress</sup> lai le  
they dou come-ASP  
‘They all came.’

(ii) Lian [tamen]<sub>f</sub> dou /\*dou<sup>stress</sup> lai le  
even they dou come-ASP  
‘Even they came.’

reading at all, it is not the same as the one in (49). Thus the two *dou*'s should be separated.

(51) a. Zheben shu ta dou<sup>stressed</sup> dule, \* keshi hai meiduwan

‘He has read the entire book. But he hasn’t finish it yet.’

b. Lian zheben shu, ta dou dule, keshi hai mei duwan  
even this-CL book, he dou read-ASP, but still not finish

‘He has read even THIS BOOK. But he hasn’t finished it yet.’

We have shown that *dou* is ambiguous in a sentence that contains a singular NP.

Below we show that the above discussion also applies to a sentence involving a plural NP.

For instance, our old example in (52) also has the distributive reading when *dou* is stressed and the scalar reading when it is not.

(52) John he Mary dou hua le yifuhua.

John and Mary dou draw -ASP one-CL picture

(i) ‘John and Mary each drew a picture.’ - Distributive, *dou*<sup>stressed</sup>

(ii) ‘Even John and Mary drew a picture.’ -Scalar reading, *dou*<sup>unstressed</sup>

In fact, to get the ‘scalar-distributive’ reading for (52), two *dou*'s can even appear overtly in the same sentence. As in (53), when scalar *dou* (*dou*<sup>scalar</sup>) is in front of distributive *dou* (*dou*<sup>dist</sup>), the sentence has the scalar-distributive meaning: That John and Mary each drew a picture was something the speaker had not expected.<sup>40</sup>

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<sup>40</sup> Roger Schwarzschild (p.c) raised a question about the order of the two *dou*'s. In fact, scalar *dou* must precede distributive *dou*. The sentence is bad when we reverse the positions of the two *dou*'s as in (i), showing that distributive *dou* somehow has to be closer to the VP than scalar *dou*.

- (53) (Lian) [John he Mary]<sub>f</sub> dou<sup>scalar</sup> dou<sup>dist</sup> hua le yifuhua  
 even John and Mary dou dou draw -ASP one-CL picture  
 ‘Even John and Mary each drew a picture’ - Scalar-Distributive reading

In addition, the sentence doesn’t have the scalar collective reading, as shown in (54). This indicates that the two *dou*’s are independently needed. That is, scalar *dou* doesn’t override the role of distributive *dou* and vice versa.

- (54) (Lian) [John he Mary]<sub>f</sub> dou<sup>scalar</sup> dou<sup>dist</sup> hua le yifuhua  
 \* ‘Even John and Mary together drew a picture.’

There is robust evidence in the language that *dou* is ambiguous. Below I provide a further evidence to demonstrate this. In (55), the reply in B1 holds as long as one of Julia’s children is older than Mary, whereas in B2, each of Julia’s children has to be older than Mary. However, these two meanings can be expressed in Chinese with one *dou*. As shown in (56), when *dou* is stressed, we get the reading in B1 and when *dou* is unstressed, we get the reading in B2. And the *even all* reading can be made available by using two

- 
- (i) \* [John he Mary]<sub>f</sub> dou<sup>dist</sup> dou<sup>scalar</sup> hua le yifuhua  
 Intended meaning: ‘Even John and Mary each drew a picture’

I don’t have an explanation why there is such a restriction to the two *dou*’s and will leave it for future study. Below I just want to point out some of the relevant discussions about this in the literature that I am aware of.

Gao (1994) provided the example in (ii) to argue for two *dou*’s, which I cited from Shyu (1995). In (ii), distributive *dou* can appear below negation, but scalar *dou* cannot.

- (ii) Lian [tamen ]<sub>f</sub> dou meiyou dou mai zheben shu  
 even they dou not dou buy this-CL book  
 ‘Even they have not all bought this book’

Zhang (1997) pointed out that the distance between scalar *dou* and the focused element is shorter than the distance between distributive *dou* and its licensors. In his approach, scalar *dou* M-commands the focused element and distributive *dou* is C-commanded by its licensor. I refer the readers to his thesis for details.

*dou*'s at the same time, as seen in (57):

(55) A: I guess Julia and Mary are of the same age.

B1: No. (As far as I know), *even* Julia's children are older than Mary.

B2: No. (As far as I know), *all* of Julia's children are older than Mary.

(56) A: I guess Julia and Mary are of the same age.

B: Bu. Julia DE haize dou bi Mary da.

No Julia DE child dou than Mary big

(57) (Lian) Julia DE haize dou<sup>scalar</sup> dou<sup>dist</sup> bi Mary da.

even Julia DE child dou dou than Mary big

'Even all of Julia's children are older than Mary.'

I will close the discussion by presenting two more arguments that have been presented in the literature for separating the two *dou*'s.

First, distributive *dou* goes with quantifiers, but scalar *dou* doesn't (Shyu 1995, Zhang 1997, Hole 2004):

(58) a. Meige ren dou lai le.

Every-CL-person dou come-ASP

'Everyone came'.

b. \* Lian meige ren dou lai le.

Even every-CL-person dou come-ASP

Second, distributive *dou* can appear below adverbs such as *yijing* 'already' or a

modal such as *xiang* ‘want’, as seen in (59)<sup>41</sup>. But scalar *dou* can’t appear in these positions, as shown in (60) (Shyu 1995, Sybesma 1996).

- (59) a. Ta neixiehua sheng [ yijing dou ] chiwan le  
 he those peanut already dou eat finish ASP  
 ‘He already ate all those peanuts.’
- b. Zhangsan zhebenshu [ xiang dou<sup>1</sup> ] kanwan  
 Zhangsan this-CL book want dou read finish  
 ‘Zhangsan wants to finish all of this book.’
- (60) a. Ta *lian* neixiehua sheng [ yijing \* dou ] chiwan le  
 he even those peanut already dou eat finish ASP  
 Intended: ‘ He already ate even those peanuts.’
- b. Zhangsan *lian* zhebenshu [ xiang \* dou ] kanwan  
 Zhangsan even this-CL book want dou read finish  
 Intended: ‘Zhangsan wants to finish even this book.’

I take the above semantic and distributional differences between the two *dou*’s as evidence in support of the two-*dou* approach. Next, we talk about the issue of potential redundancy.

### 3.4.2 The issue of redundancy

As discussed earlier, unstressed *dou* is scalar regardless of whether *lian* is present

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<sup>41</sup> This is also the case for negation as mentioned in the previous footnote. That is, a distributive *dou* can appear below negation *meiyou* ‘not’ but the scalar *dou* can’t.

or not. One might assume that *lian* is always covertly available with *dou* (in contrast to *ye*, where *lian*'s presence is required to get scalarity), and there is no need to compute *lian* for the *dou* statement, and the redundancy issue won't arise. However, as we have also mentioned, the presence of *lian* requires the presence of *dou* and in that case, we have to compute both *lian* and *dou*. Moreover, assuming a covert *lian* would miss the whole point we have tried hard to prove, namely, that *dou/ye* and *lian...dou/lian...ye* are different. Therefore we maintain that redundancy is not a problem. Below we provide empirical support for this.

Shyu (1995) presents facts similar to the following when she talks about the differences between *shenzhi* 'even' and *lian...dou*. Here I take them to suggest an approach to the redundancy question.

First, unlike *lian*, a particle such as *shenzhi* can perform the scalar function alone, as in (61). But *shenzhi* also co-occurs with *dou* to express the same meaning as *lian...dou*. This is shown in (62):

- (61) John    *shenzhi* /\**lian*                    zuochulaile    [di'erti]<sub>f</sub>  
           John    even    /even                    figure out ASP problem 2  
           'John even solved problem 2.'
- (62) John    *shenzhi* *dou*                    zuochulaile    [di'erti]<sub>f</sub>  
           John    even    dou                    figure out ASP problem 2  
           'John even solved problem 2.'

In addition, just like *lian*, *shenzhi* also requires the use of *dou* or *ye* when we prepose the object to a preverbal position, as in (63). Note that *shenzhi* may also co-occur with *lian* in the same context, as in (64).



- (63) John *shenzhi* /*lian* [di'erti]<sub>f</sub> \*(dou/ye) zuochulaile  
 John even /even problem 2 dou/also figure out ASP  
 'John even solved problem 2.'
- (64) John *shenzhi* *lian* [di'erti]<sub>f</sub> \*(dou/ye) zuochulaile  
 John even *lian* problem 2 dou/also figure out ASP  
 'John even solved problem 2.'

It is clear from the data that redundancy is not a problem but compatibility is. The approach I have attempted has been built on defining meanings of the particles in a way that (in)compatibility is relevant to explaining the distributional facts. In addition, the fact that *shenzhi* also needs *dou* or *ye* in (63) suggests that the dependence requirement should not be a semantic one, because *shenzhi* alone may have the scalar meaning elsewhere. But the difference between *shenzhi* and *lian* with respect to the need for *dou/ye* is something we need to address. To this we turn next.

### 3.4.3 The dependence of *lian* on *dou/ye*

Recall that we took *lian* to have the same meaning as *even*. But why doesn't *lian* suffice to give the sentence the scalar meaning independently of *dou* or *ye* like *even*? In other words, why does *lian* rely on *dou/ye* to realize its scalarity? I have mentioned above that it is not a semantic problem. In what follows, I would like to suggest a syntactic solution to this problem. I do this by adopting the feature checking approach of Shyu (1995) and the analysis of Lin (1998) that appeals to a distinction between strong and weak features.

We have seen that with *dou/ye*, both NP<sub>f</sub> and *lian*-NP<sub>f</sub> are ok in a preverbal position, where *dou* gives rise to the scalar reading but not *ye*:

(65) [... NP<sub>f</sub> ..... dou/ye ... VP .. ....] ✓

(66) [... *lian* NP<sub>f</sub>..... dou/ye ...VP.....] ✓

But so far we haven't seen what the situation is when the focused NP is in a post-verbal position. As shown in (67) and (68), in this position, NP<sub>f</sub> and *lian*-NP<sub>f</sub> differ: NP<sub>f</sub> is ok but *lian*-NP<sub>f</sub> is no longer ok.

(67) [... dou/ye ...VP .....NP<sub>f</sub>..... ] ✓

(68) [... dou/ye... VP .....\**lian* NP<sub>f</sub>.....] \*

Evidence for this contrast comes from the following. In (69), NP<sub>f</sub> is ok with *dou/ye* to its left and the claimed difference between *dou* and *ye* as they are in (65) still exists. That is, the *dou*-statement has the scalar reading and the *ye*-statement has the existential reading. But *lian* NP<sub>f</sub> is not acceptable with *dou/ye* to its left, as in (70).

(69) John dou/ ye zuochulaile [di'erti]<sub>f</sub>  
 John dou/also figure out ASP problem 2  
 'John even/also solved problem 2.'

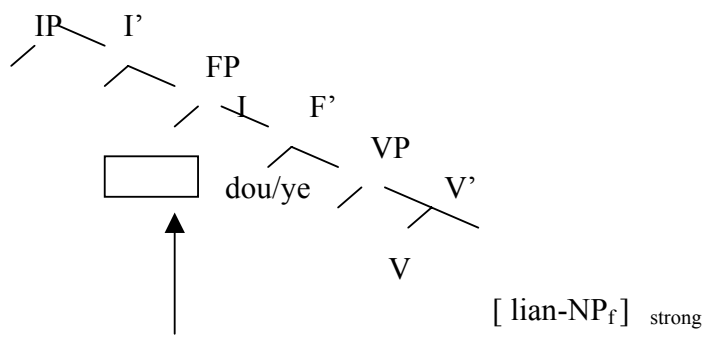
(70) \* John dou/ ye zuochulaile *lian* [di'erti]<sub>f</sub>  
 John dou/also figure out ASP even problem 2  
 Intended: 'John even solved problem 2.'

The above paradigm raises the following questions: (a) Why does preverbal *lian* NP<sub>f</sub> need *dou/ye* whereas the post-verbal *lian* NP<sub>f</sub> is bad? (b) Why does the plain NP<sub>f</sub>

occur in both positions?

Shyu (1995) addressed the first question as follows. According to her, *dou/ye* heads the functional projection Focus P and it has a strong focus feature [+focus] that needs to be checked. *Lian*-NP is strong and it has to move to have its strong feature checked against *dou/ye*. Thus *lian*-NP needs *dou/ye* because their strong features get checked against each other. But *lian*-NP is not acceptable in the post verbal position because its strong feature can't be checked there.

(71)



But then how do we explain the second problem: why is NP<sub>f</sub> ok both preverbally and postverbally? In Shyu's approach, the preverbal NP<sub>f</sub> would be taken as involving a silent *lian*. That is, NP<sub>f</sub> ...*dou* is always *lian* NP<sub>f</sub>...*dou* with a covert *lian*. However, this would predict that NP<sub>f</sub> ...*ye* is always *lian* NP<sub>f</sub>...*ye*, which as we argued in 3.2 is not the case. In addition, she didn't discuss the NP<sub>f</sub> in the postverbal position. But as seen in (69), the contrast between *dou/ye* also exists there.

Below I propose to deal with the second problem following Lin's (1998) treatment of distributive *dou*.

As discussed in Lin (1998), distributive *dou* shows the following paradigm with respect to its associates. As in (72), preverbal *mei*-NPs require the use of *dou* but postverbal *mei*-NPs are bad. However, unlike *mei*-NPs that don't appear in the object position, *wh*-NPs do. The said difference between *mei*-NPs and *wh*-elements in an object position is seen in (73).

(72) a. [... *mei*-NP .... *dou* .....] ✓

b. [... *dou* ... \**mei*-NP ...] \*

c. [...*dou* ... *wh*-elements] ✓

(73) \*a. Ta *dou* maile mei yiben shu. \* [ *dou*...*mei*-NP]

he *dou* buy-ASP every one-CL book

Intended: 'He bought every book.'

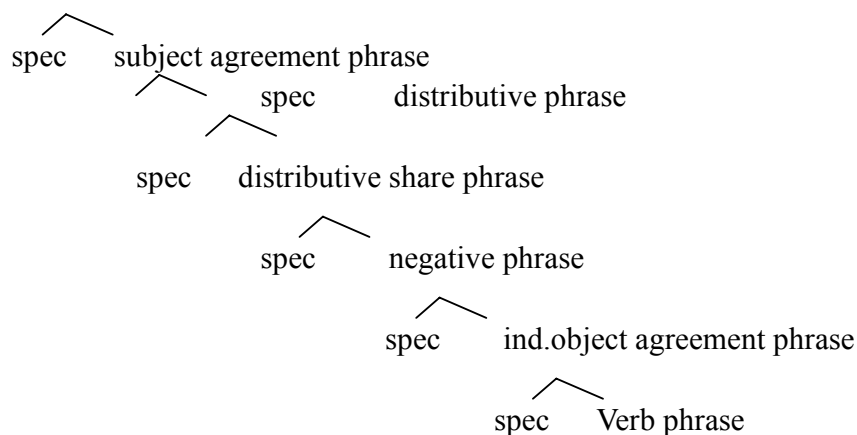
b. Nidou mai le shenme? <sup>OK</sup> [ *dou*...*wh*-element]

You *dou* buy-ASP what

'What did you buy?'

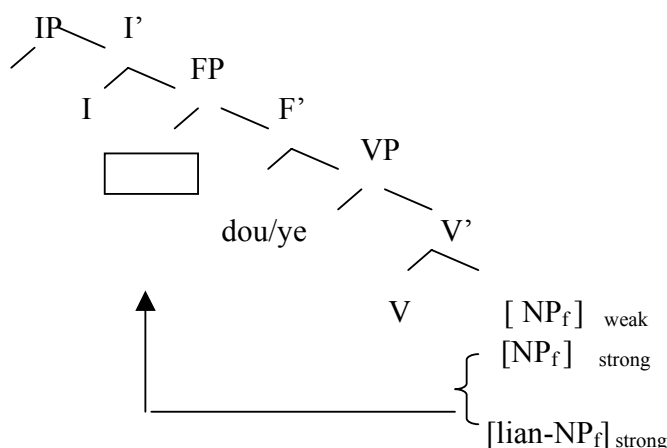
Lin (1998) proposed to deal with this problem by appealing to the notion of strong and weak features. In particular, following Stowell and Beghelli's (1994) hierarchy of functional projections in (74), he assumed that *dou* heads a functional projection Distributive Phrase (Dist P). The universal NPs such as *mei*-NP is quantificationally strong, thus it has to move to the spec of Dist P to check its strong feature in syntax. But a *wh*-NP is quantificationally weak, so it doesn't move.

(74) referential phrase



Suppose we follow Shyu's approach of feature checking and Lin's distinction of strong/weak features, the problem raised by plain NP<sub>f</sub> can be treated as follows. As seen in (75), the focus feature of a plain NP<sub>f</sub> can be strong or weak. If it is strong, it moves, but if it is weak, it stays in its base position. Thus it can occur in either pre- or post- verbal position. In comparison, *lian*-NP<sub>f</sub> has a strong focus feature that has to be checked against that of *dou/ye*, thus it is not allowed postverbally. The consequence of this analysis is compatible with our semantic claims for NP<sub>f</sub> in the post-verbal position, as in (76). *Dou* in combination with a postverbal NP<sub>f</sub> has a scalar meaning, but *ye* in combination with a postverbal NP<sub>f</sub> has an existential meaning.

(75)



(76) a. [... dou ... VP .....NP<sub>f</sub> weak ] -scalar meaning

b. [... ye ... VP .....NP<sub>f</sub> weak ] - existential meaning

To sum up, the dependence issue is solved based on the requirement of feature checking between the NPs and the particles. In particular, we claimed that the dependence relation between a NP in focus and *dou* or *ye* is a reflection of the feature strength attached to a NP. If a NP in focus is strong with a strong feature, it has to appear above *dou* or *ye*. Since a *lian* NP has a strong focus feature, it always requires *dou* or *ye* to check its strong feature, thus it always appears above *dou* or *ye*. In contrast, since a plain NP can be strong or weak, it may appear either above or below *dou* or *ye*.

We have addressed so far the ambiguity issue, redundancy issue, and dependence issue. We will devote 3.4.4 below to the last topic to be discussed in this section: the issue of scalarity in the *ye* statements.

### 3.4.4 *ye* and the scalarity

We have argued on the basis of extensive data that *ye* does not contribute scalarity. However, there are cases where a *ye* statement has a scalar reading even in the absence of *lian*. We consider those cases now. We suggest that this is not because *ye* is scalar, rather, this is because the needed scale is provided by the context.

Consider the example below where the focus is on *this simplest question*.

- (77) (Ta) [zhege zuijiandan de wenti ]<sub>f</sub>      ye      budong !  
 (he) this-CL most simple question      also      not understand  
 ‘(He) didn’t understand even this simplest question.’

It is easy to get the scalar reading for this sentence without the presence of *lian*. I assume that this is because the NP here is inherently scalar. To say someone doesn’t understand the simplest question entails that he doesn’t understand other questions that are less simple. Note that NPs like this differ from the type of NP such as *problem 2* in that the former can’t appear in a positive sentence but the latter is ok in both positive and negative contexts. This is seen in (78) and (79). This is because the latter doesn’t impose a scale or an ordering between *problem 2* and its alternatives, as we have discussed earlier. For example, (79a) simply says that there is something other than *problem 2* that he understood without implicating the difficulty about *problem 2*. (79b) says that there is something other than *problem 2* that he didn’t understand. Again this sentence doesn’t imply the difficulty of *problem 2*.

(78) # (Ta) [zhege zuijiandan de wenti ]<sub>f</sub> ye dong!

he this-CL most simple DE question also understand

‘(He) understood even this simplest question.’

(79) a. (Ta) [di’erti ]<sub>f</sub> ye dong

(he) problem 2 also understand

‘(He) also understood problem 2.’

b. (Ta) [di’erti ]<sub>f</sub> ye bu dong

(he) problem 2 also not understand

‘(He) didn’t understand problem 2, either.’

Such phrases have been called minimizers and have been analyzed as inherently scalar by Ladusaw (1979), Lahiri (1998), Hole (2004) and Guerzoni (2003). For example, minimizers in (80) in the sense of Hole don’t need *lian* to have scalar readings. In (80a), if he didn’t solve one problem, it entails that he didn’t solve other number of problems. Similarly in (80b), the fact that he didn’t drink the minimal amount of water entails that he didn’t drink other amounts of water. Thus the function of *lian* is provided by the context.

(80) a. Ta [ yidao ti ]<sub>f</sub> ye mei zuochulai.

he one-CL problem also not figure out

‘He didn’t solve even ONE PROBLEM.’

b. Ta [ yidishui ]<sub>f</sub> ye mei he.

he 1-CL water also not drink



‘He didn’t drink even A DROP OF WATER.’

To conclude, even though *ye* is not scalar, scalarity may come out if the context provides the needed scale.

### 3.4.5 Summary

In this section we addressed several more issues to defend our analysis of *lian...dou/ye* constructions. First, we provided evidence to support our claim that *dou* is ambiguous between the scalar reading and the distributive reading. Second, we argued that positing *lian* and *dou* as introducing scalarity doesn’t pose any problem because of the compatibility in meanings we have proposed. Empirical support for it was provided from the distribution of *shenzhi* ‘even’. Third, we provided a syntactic explanation for the dependence of *lian*-NP on *dou/ye* in Chinese. This was done by considering the distributional differences between *lian*-NPs and plain NPs in relation to *dou/ye*. Finally, we maintained that *ye* is not scalar even if some *ye* sentences have scalar readings independently of *lian*. I suggest that this is so because the context provides the needed scale that is usually conveyed by *lian*.

In the rest of the chapter, I will discuss briefly whether negative contexts pose a problem to the proposed analysis and in what ways the analysis is similar to and different from previous approaches.

## 3.5 Scope and scalarity

In this section I would like to briefly address issues raised by negative contexts for our analysis of *lian...dou/ye*. As we know *even* is ambiguous between two sets of presuppositions under the scope of a negative polarity trigger but the same is not true of the Chinese cases we are looking at.<sup>42</sup> Specifically, in Chinese there is syntactic disambiguation: the overt scopal relations determine the different sets of presuppositions. Thus whatever be the right approach for *even*, the parallel I have drawn between *lian* and *even* is maintained once this syntactic difference between Chinese and English with respect to overt vs. covert scopal relations is factored in.

*Even* in a negative context is associated with different set of presuppositions from

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<sup>42</sup> To deal with *even* in a negative context, two theories have been proposed. One is the scope theory and the other is the lexical ambiguity theory. The scope theory takes the presuppositions *even* associates with in a negative context as arising from *even* taking wide scope over the negation (see Karttunen & Peters 1979, Wilkinson 1996, Lahiri 1998, and Guerzoni 2003). The lexical approach assumes that in addition to the regular *even*, there is another negative polarity *even* that appears in the scope of negation (see Rooth 1985, von Stechow 1991, Rullmann 1997, and Giannakidou 2003). Below I show how (i) is dealt with in each approach. First, in the scope approach, (i) will have the LF and the interpretations in (ii):

- (i) He didn't even solve [problem 2]<sub>f</sub>
- (ii) a. LF: even [he didn't [solve problem 2]<sub>f</sub>]]
  - b. Scalar: *He didn't solve problem 2* is less likely than that *he didn't solve problem x* ( It is more likely that *He solved problem 2* )
  - c. Existential: there is other problem x that he didn't solve

On the other hand, Rooth (1985) proposed that besides the regular *even*, there is a negative polarity *even*, as in (iii) that appears in the scope of negation. In this approach, the same sentence above will have the LF and the interpretations in (iv):

- (iii) NPI -*even*
  - a. Scalarity:  $\forall q [C(q) \& q \neq p \rightarrow q <_{\text{likely}} p]$
  - b. Existentiality:  $\exists q [C(q) \& q \text{ is not true} \& q \neq p]$
- (iv) a. LF: [He didn't [even [t solve problem 2]<sub>f</sub>]]
  - b. Scalar : It is more likely that he solved problem 2 than he solved problem x.
  - c. Existential: He didn't solve problem x

*even* in a positive context. For example, *even* in (81) is associated with the *least likely* presupposition: it is less likely that he solved problem 2 and *even* in (82) is associated with the *most likely* presupposition: it is more likely that he solved problem 2.

(81) He solved even [problem 2]<sub>f</sub>

(82) He didn't even solve [problem 2]<sub>f</sub>

As observed in Karttunen & Peters (1979), when sentences such as (81) are embedded in the scope of a negative trigger such as *it is hard to believe*, they show ambiguity between *the least likely* and *the most likely* readings:

(83) It is hard to believe that he solved even PROBLEM 2

(i) It is less likely that he solved Problem 2. -Least likely reading

(ii) It is more likely that he solved Problem 2. -Most likely reading

The Chinese counterpart of the negative sentence in (82) uses *mei* 'not', as in (84). Unlike the English sentence where negation scopes above *even*, *mei* is below *lian...dou/ye* syntactically. But like its English equivalent, the sentence carries *the most likely* presupposition: it is more likely for him to solve problem 2 or problem 2 is an easy problem.

(84) Ta lian [di'erti]<sub>f</sub> dou/ye mei zuochulai [lian...dou/ye > not]

he even problem 2 dou/also not figure out

'He didn't even solve problem 2.'

However, the Chinese equivalent of (83) with *lian...dou/ye* under the scope of the NPI trigger shows no ambiguity. It has only the *least likely* presupposition, as in (85).

- (85) Hennan xiangxin ta *lian* [di'erti]<sub>f</sub> dou/ye zuochulai le  
 very hard believe he even PROBLEM 2 dou/also solve ASP

'It is hard to believe that he even solved PROBLEM 2'.

- (i) It is less likely that he solved Problem 2. -Least likely reading  
 (ii) \*It is more likely that he solved Problem 2. \*-Most likely reading

To get the *most likely* presupposition, *lian...dou/ye* has to be above the NPI trigger in the surface syntax, as shown in (86):

- (86) Lian [di'erti] dou/ye hennan xiangxin ta zuochulai le  
*lian* PROBLEM 2 dou/also very hard believe he solve ASP .

- (i) \*It is less likely that he solved Problem 2. -\*Least likely  
 (ii) It is more likely that he solved Problem 2. -Most likely

This shows that the two sets of different implicatures correspond to the overt scopal relations *lian...dou/ye* has relative to the negative trigger. Specifically, *the least likely* reading appears only when *lian...dou/ye* is below the negative trigger and *the mostly likely* reading shows up only when it is above the trigger:

- (87) a. [NPI trigger > *lian...dou/ye* ] -*least likely* reading  
 b. [ *lian...dou/ye* > NPI trigger ] -*most likely* reading

The above implicature-scope interaction is evidenced by the fact that expressions such as *the most difficult problem* and *the simplest problem* are licensed only in one of the above contexts. As shown in (88), the expressions like *the most difficult problem* are good only when it is below the negative trigger. In contrast, the expressions like *the simplest*

*problem* are good only when it is above the trigger, as in (89).

(88) a. trigger > *the most difficult problem*

hennan xiangxin ta *lian* zuinande wenti *dou/ye* zuochulai le

very hard believe he even most difficult DE problem dou/also solve ASP

‘It is hard to believe that he solved even the most difficult problem’.

\*b. *the most difficult problem* > trigger

*lian* zuinande wenti *dou/ye* hennan xiangxin he zuochulai le

even most difficult DE problem dou/also very hard believe he solve ASP

‘It is hard to believe that he solved even the most difficult problem’.

(89) \*a. trigger > *the simplest problem* -

Hennan xiangxin ta *lian* zuijiandande wenti *dou/ye* zuochulai le

very hard believe he *lian* most simple DE problem dou/ye solve ASP

‘It is hard to believe that he solved even the simplest problem’.

b. *the simplest problem* > trigger

*lian* zuijiandan de wenti *dou/ye* hennan xiangxin ta zuochulai le

*lian* most simple DE problem dou/also very hard believe he solve ASP

‘It is hard to believe that he solved even the simplest problem’.

To sum up, while *even* is ambiguous when embedded under a negative trigger, Chinese *lian* is not. Following a suggestion by Veneeta Dayal (p.c.) I explain these facts in terms of a difference in how scope is assigned in the two languages. This is in fact similar to the interaction of quantificational phrases in English and Chinese. As in (90)

and (91), while English sentences are ambiguous, Chinese sentences are not. In Chinese, scope is more aligned with surface order (Aoun & Li, 1993).

- (90) a. Some man loves every woman -ambiguous  
 b. Every man loves a woman -ambiguous
- (91) Meige nanren dou xihuan yige nuren  
 Every-CL man dou like one-CL woman  
 ‘Every man loves a woman’ -unambiguous

Before I end this chapter, I would like to consider two other approaches to focus *dou* in the literature to see how successful they are to deal with the data we have presented.

### 3.6 Previous approaches to scalarity and *dou*

In this section, I focus on the following two approaches to the semantics of *lian...dou/ye*: the analysis in Wu (1999) and Portner (2002) and the analysis in Hole (2004). Wu (1999) and Portner (2002) propose a distributive analysis of *dou* and Hole (2004) a non-distributive analysis. Below we first present their main arguments and then point out their potential problems in dealing with the data presented earlier in this chapter.

#### 3.6.1 Wu (1999) & Portner (2002)

Wu (1999) and Portner (2002) suggest that *dou* in *lian...dou* is distributive and the

distributivity is satisfied through focus-induced alternatives. Below, we will focus on Portner's analysis, since his analysis is more explicitly spelt out.

According to Portner, focus induces a set of alternatives to the expression in focus and the sentence with the structure *lian...dou* has the following interpretations:<sup>43</sup>

(92) D [Lian X [Pred...dou]], D is an implicit topical set of alternatives to X and X is at the extreme end of the contextually given scale on D

(a) Asserts: Pred (X)

(b) Implicates:  $\forall x \in D$  [Pred (x)]

(92a) says that a *dou* statement asserts that the predicate is true of the expression in focus, which is at the extreme end of the scale formed on the set of alternatives. (92b) says that it implicates that the predicate is true of each member of the set of alternatives. In this view, a simple example such as (93) below will have the interpretations in (94), if we assume that the focus-induced alternatives to John are Mary and Peter in the context.

(93) Lian [John]<sub>f</sub> dou lai le  
even John dou come-ASP

'Even John came'

(94) (a) Asserts: come' (j)

(b) Implicates:  $\forall x \in \{j, m, p\}$  [come' (x)]

= {John came, Mary came, Peter came}

In (94), (a) asserts that John came with John standing at the extreme end of the

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<sup>43</sup> Portner doesn't discuss *lian...ye*.

scale formed with the alternatives Mary and Peter. (b) implicates that all of the contextually relevant individuals John, Mary and Peter came. This way, *dou* distributes over the focus-induced alternatives, resulting in universal quantification over the alternative propositions: John came, Mary came and Peter came.

One nice thing about the analysis is that it provides a way to unify this *dou* with distributive *dou* in the contexts of definite plurals, assuming that they quantify over different domains and at different levels. Concretely, *dou* in the focus structure quantifies over the alternatives induced by focus, whereas distributive *dou* quantifies over the plural individuals denoted by the plural argument. In addition, the distributivity of *dou* in the contexts of definite plurals applies at the level of truth-conditions, the distributivity of *dou* in focus structure, however, is an implication.

Despite the attraction of the proposal, there are some problems with it. First, it is not obvious how this analysis deals with sentences like (95) if there is only one *dou*. Presumably, to make (95) work in this approach, we somehow have to allow *dou* to play both the scalar function and the distributive function at the same time as in (96). But it is not clear how this can be done.

(95) John he Mary *dou*<sup>scalar</sup> *dou*<sup>dist</sup> hua le yifuhua.

John and Mary *dou* *dou* draw -ASP one-CL picture

‘ Even John and Mary each drew a picture.’

(96) [NP]<sub>f</sub> *dou*<sup>scalar/dist</sup> VP

In my approach, (95) can be dealt with as follows. As shown in (97), in (a), *dou*<sup>dist</sup>



is part of the assertion of the sentence and (b) are the alternative propositions.  $\text{Dou}^{\text{scalar}}$  in (c) introduces the presupposition that the assertion exceeds the speaker's expectation. In particular, the sentence asserts that *John and Mary each drew a picture* and presupposes that the assertion *John and Mary each drew a picture* exceeds the speaker's expectation. Thus we derive the scalar-distributive reading of the sentence.

- (97)  $[\text{NP}]_f \text{ dou}^{\text{scalar}} \text{ dou}^{\text{dist}} \text{ VP}$
- a.  $\llbracket [\text{NP}]_f \text{ dou}^{\text{scalar}} \text{ dou}^{\text{dist}} \text{ VP} \rrbracket^0: \text{NP dou}^{\text{dist}} \text{ VP}$
- b.  $\llbracket [\text{NP}]_f \text{ dou}^{\text{scalar}} \text{ dou}^{\text{dist}} \text{ VP} \rrbracket^f:$   
 $\{\text{NP dou}^{\text{dist}} \text{ VP}, \text{NP}^1 \text{ dou}^{\text{dist}} \text{ VP}, \text{NP}^2 \text{ dou}^{\text{dist}} \text{ VP}\}$
- c. The scalar presupposition  $\text{dou}^{\text{dou}}$   
 $\forall q \llbracket [C(q) \ \& \ q \neq p] \rightarrow p \rrbracket_{\text{speaker-expectation}} q]$

Second, Portner's claim of universal quantification may be too strong. For example, this would wrongly predict that (98) has the meaning in (99), which says that John is an associate professor and he is also an assistant professor. As discussed earlier, this is in conflict with our world knowledge about the academic profession.

- (98) John lian [fu jiaoshou ]<sub>f</sub> dou shi le.  
 John even associate professor dou be ASP  
 'John is even an associate professor!'

- (99) (a) Asserts: be' (j, associate professor)  
 (b) Implicates:  $\forall x \in \{\text{associate professor, assistant professor}\} [\text{be}' (j, x)]$

The point is clearer if we look at (100), which involves the contrast between

*lian...dou* and *lian...ye*. As discussed earlier, when there are only two problems in the context, (100) is good with *lian...dou* but is not so with *lian...ye*. However, in this approach, *lian...dou* will entail *lian...ye* if we assume *ye* is existential, as in (101). Thus if *lian...dou* is fine in this context, *lian...ye* should also be fine, leaving the contrast unexplained. This causes no problem on our approach, however, because for us, *dou* is merely what the speaker has expectations about the alternative propositions, not that the proposition be true as is the case with *ye*.

(100) John *lian* [di'er ti] dou /\* ye zuo chulaile,  
 John *lian* problem 2 dou/also figure out ASP,  
 keshi ta mei zuochulai lingyidao.

but he not figure out another one-CL

'John solved even problem 2, but he didn't solve the other problem.'

(101) (a) Asserts: solve' (j, problem 2)

(b) Implicates:  $\forall x \in \{\text{problem 2, problem 4}\}$  [solve' (j, x)] *-lian...dou*

(c) Implicates:  $\exists x \in \{\text{problem 2, problem 4}\}$  [solve' (j, x)] *-lian...ye*

The above shows that the approach that universally quantifies over the focus induced alternatives is not satisfactory in dealing with the data we have presented in the chapter.

### 3.6.2 Hole (2004)

Hole (2004) assumes that there are two *dou*'s. One is distributive *dou* and one is

what he calls parametric *dou*. *Dou* in *lian...dou* belongs to the latter. He proposes that the parametric *dou* is confined to emphatic assertions, following Krifka (1995). According to him, ‘*dou* is a particle indicating that a certain kind of focus precedes it; the kind of focus in this case is a *lian* focus in an emphatic assertion. Since (*lian*-foci) emphatic assertions allow us to conclude that all the contextually relevant alternative sentences are, by virtue of their relative semantic weakness, likewise held to be true, we are dealing with universal quantification.’ And he gives the following description for *dou*:

- (102) a. *Dou* is an agreement marker; the verbal background agrees with a semantically specific focus.
- b. Among all the possible alternatives to *dou*-sentences that only differ with regard to the focus value, the pragmatically relevant set of alternatives is considered, and it is presupposed or entailed that all of these alternatives are true.

To appreciate his analysis, we need to introduce briefly Krifka’s notion of emphatic assertions. According to Krifka, emphatic assertions are assertions that have incorporated the scalar implicatures of *even*. For example, in (103), (a) is truth-conditionally equivalent to (b) but it also carries the meanings in (c) and (d). Thus, if the speaker chooses the form in (a), he is in fact making the stronger assertion that John would distrust anyone within the common ground of the listener and speaker. This is because Albert Schweitzer marks an extreme value on the pragmatic scale of trustworthiness. In addition, the emphatic effect can be made explicit by the use of *even*.

As in (104), *even* doesn't add anything to the meaning of the sentence containing it; it simply makes explicit what is already there.

- (103) a. John would distrust ***Albert Schweitzer!***  
 b. John would distrust Albert Schweitzer.  
 c. John would distrust each of those persons who are less trustworthy than  
     Albert Schweitzer  
 d. John would distrust all of less trustworthy people taken together.
- (104) John would distrust even ***Albert Schweitzer!***

Hole relates Chinese *dou/ye* to this discussion by assuming that *dou/ye* in (105) involves emphatic assertions. But *dou/ye* in (106) doesn't. For example, he assumes that sentences in (107a) involve both the emphatic assertion and *lian*. But sentences in (107b) don't. In fact, according to him, *dou* is bad in this context.<sup>44</sup> Only *ye* is ok with the *also* meaning.

(105) [... .. (lian) NP<sub>f</sub> ..... dou/ye.....]

(106) [... .. dou/ye ... NP<sub>f</sub>.....]

- (107) a. Xiao Wang (lian) [ jirou ]<sub>f</sub> dou/ye buchi  
     Little Wang even chicken-mean dou/also not eat  
     ‘Little Wang doesn't even eat CHICKEN!’

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<sup>44</sup> I don't agree with his judgments for this sentence. We will show more below that sentences in the form of (106) with *dou* are good and with scalar readings.

- b. Xiao Wang      \*dou/ye    buchi            [ jirou ]<sub>f</sub>  
 Little Wang      dou/also not eat      chicken-mean  
 ‘Little Wang doesn’t eat CHICKEN, either!’

I think the main problem with Hole’s approach is that while he claims that ‘ the use of parametric *dou* and *ye* is confined to emphatic assertions’, he doesn’t specify what counts as a parametric *dou* or *ye*. Based on his claim for (107), he seems to suggest that *dou* and *ye* are parametric if the focused element is in the preverbal position. But as we discussed earlier, this is problematic because *dou* in either (108) or (109) may have the scalar reading and *ye* in either case may have only the *also* meaning. If emphatic assertions are involved in (108) but not in (109), it is puzzling how the scalar reading is derived for the latter.

(108) [ ... NP<sub>f</sub> ... ..dou/ye ... ]

(109) [ ... dou/ye ... NP<sub>f</sub>..... ]

In concluding this section, I would like to present two more examples to show that *dou*, in the contexts of (109), indeed involves the scalar reading. These examples are taken from Zhang (1997), who gives credit to Lü (1980).

- (110) Wo dou    bu zhidao    ni    hui lai  
 I    dou    not know    you will come  
 ‘I even DID NOT KNOW YOU WOULD COME.’

- (111) Zhenbaoqian, wo dou    wang le ni de mingzi le  
 really sorry    I    dou    forget –ASP you-DE name-ASP

‘I’m sorry. I even FORGET YOUR NAME.’

These data cast some doubt on Hole’s proposal that hinges on the distributions of *dou* or *ye* to determine the involvement of emphatic assertions.

### 3.7 Conclusion

In this chapter we studied the semantics of *dou* in *lian...dou/ye* constructions and claimed that this *dou* needs a separate account from that of distributive *dou*. To this end, we explored three main issues in this chapter: the alternation between *dou* and *ye*, the optionality of *lian* and the dependence of *lian* on *dou/ye*. We proposed that both *dou* and *lian* have a scalar meaning, but *ye* doesn’t. *Lian + dou* has only scalar meaning but *lian + ye* has both scalar and existential meanings, as in (112). This implies that the alternation between *dou* and *ye* is not completely free and *lian* is not strictly optional, it’s presence or absence has a semantic impact. In addition, the reason that *lian* depends on *dou/ye* is that *lian* syntactically requires *dou/ye* to check its strong focus feature.

(112) *lian*, *dou* and *ye*

<i>dou</i> == > scalar
<i>ye</i> == > existential
<i>lian</i> ==> scalar
<i>lian ... dou</i> == > scalar
<i>lian ... ye</i> == > scalar + existential

This analysis has been shown to have several advantages over the previous analyses. I have claimed that *dou* is ambiguous between a scalar particle and a distributive operator, an ambiguity which is signaled by stress. I have also separated the semantic contributions of individual particles in the complex *lian...dou/ye* constructions and shown how they can combine compositionally. The account correctly predicts that the two *dou*'s can co-occur, and when they do, what their semantics will be. We will see in chapter 4 that the distinction of two *dou*'s will help identify the free choice structures containing *dou*.

## CHAPTER 4

### DOU AND FREE CHOICE

#### 4.1 Introduction

In chapter 2 and 3, we investigated the semantics of *dou* in *dou*-(dis)harmony and in *lian...dou* constructions, respectively. The former deals with *dou* in the context of quantifiers and concludes that context sensitivity has to be built into the analysis of *dou* as a distributive operator. The latter deals with *dou* in the context of NPs that are focused. In this context, *dou* gives the sentence a scalar reading similar to that of *even*. We proposed that the scalar *dou* be treated separately from *dou* in *dou*-(dis)harmony. We also suggested relating the two *dou*'s in terms of their shared context sensitivity. In this chapter, we look at *dou* in sentences with a free choice reading, similar to sentences with *any* in English. As shown below, *any* in (1) is a free choice item (FCI)<sup>45</sup>. As a FCI, it has a universal interpretation similar to the sentence with *every*. For example, (1a) means that everyone can solve this problem and (1b) means that it is obligatory for everyone to obey the traffic rules. (2) shows that the equivalents of (1) in Chinese may be expressed with either *renhe* 'any' plus *dou* (*renhe...dou*) or with a *wh*-element plus *dou* (*wh...dou*).<sup>46</sup>

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<sup>45</sup> *Any* used in the examples below with an existential reading is called a negative polarity item (NPI). We will talk a bit more about it below.

(i) He didn't solve any problem.

(ii) He didn't buy any book.

<sup>46</sup> *Dou* is not obligatory when *renhe* is in the object position. We will discuss that in section



- (1) a. Anyone can solve this problem.  
 b. Anyone must obey the traffic regulations.
- (2) a. Renhe yigeren/ Shei \*(dou) neng jiejie zhege wenti.  
 any one-CL person /who dou can solve this-CL problem
- b. Renheyigeren/ Shei \*(dou) dei zunshou jiaotong guize.  
 any one-CL person /who dou must obey traffic rules

One crucial feature of the FCI *any* is that it is not typically licensed in an episodic context. As shown in (3), the examples in (1) are unacceptable when we remove the modals from them.

- (3) a. \* Anyone solved this problem.  
 b. \* Anyone obeyed the traffic regulations.

The same goes for the Chinese sentences with *renhe* or *shui*. As shown in (4), none of the sentences is acceptable when the modals *neng* ‘can’ and *dei* ‘must’ are removed from (2).

- (4) a. \*Renheyigeren/ \*Shui dou jiejuele zhege wenti.  
 any one-CL person/who dou solve-ASP this-CL problem  
 ‘Anyone solved this problem.’
- b. \* Renheyigeren/\*Shui dou zunshoule jiaotong guize.  
 Any one-CL person/who dou obey-ASP traffic rules  
 ‘Anyone obeyed thee traffic regulations.’

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4.3. In the rest of the discussions, we will focus on *renhe* and *wh*-words in the preverbal positions where *dou* is always required.

To my knowledge, *dou* in free choice contexts has been explicitly studied by Lin (1996) and Cheng and Giannakidou (2005)<sup>47</sup>. Lin (1996) proposes that *dou* in this context is a distributive operator, distributing over the union of the set of individuals formed by a silent *wulun* ‘no matter’. But he doesn’t discuss *renhe...dou*. Cheng and Giannakidou (2005), on the other hand, discuss both types of free choice structures and propose that *dou* is an iota operator. It turns an indefinite FCI into a definite one. In other words, both *renhe...dou* and *wh...dou* are definite FCIs.

My goal in this chapter is a modest one. I will try to characterize the two FC structures in (2) carefully to see to what extent they are similar and to what extent they are different by drawing on the analyses of English *any* and *wh-ever*. I will also see to what extent the above analyses of Lin (1996) and Cheng & Giannakidou (2005) are applicable to one or the other or both or neither.

This chapter is organized as follows. Section 4.2 is an introduction of the theories on English FC *any* and *wh-ever* I will adopt in this chapter. 4.3 presents the parallelism between *renhe...dou* ‘any’ and FC *any* on the one hand and *renhe...dou* ‘any’ and *mei...dou* ‘every’ on the other. A suggestion is made to treat *renhe...dou* on a par with *mei...dou*. Section 4.4 shows the extent to which *wh...dou* is similar to and different from *renhe...dou* and concludes that the two should be treated separately. Previous analyses of *wh...dou* are evaluated in 4.5. 4.6 is the conclusion.

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<sup>47</sup> See also Cheng and Giannakidou (2006).

## 4.2 Background on free choice items

FC *any* has been extensively studied in the past 30 years. The central debate is what quantificational force it has: existential/indefinite or universal? Earlier studies of the issue have tried to assimilate FC *any* to the indefinite analysis of NPI *any*. Along this line, Kadmon & Landman's (1993) work is influential. Their insight is that FC *any* is an indefinite used in a generic context. It gets the universal interpretation from binding of a generic operator that has universal force. However, this analysis is challenged by Dayal (1998). She argues convincingly that FC *any* doesn't get its universal force from binding of an outside operator of some sort; instead, it has its own universal force. It is a universal quantifier that has genericity or modality built-in. From then on, many researchers have joined the indefinite-universal debate, resulting in huge cross-linguistic contributions to the understanding of FCIs. (e.g. Quer 1998 on Catalan; Lahiri 1998 on Hindi; Saboe 2001 on Scandinavian; Giannakidou 2001 on Greek; Kratzer and Syimoyama 2002 on German; Chierchia 2004 on Italian).

In this chapter, I will follow the account of free choice items in Dayal (1997, 1998, 2004). In her series of works, Dayal shows two things. One, *any* is a universal but not a generic indefinite. Two, *any* is different from *wh-ever* in being a universal rather than a definite. Below I will present her analysis of *any* and *wh-ever*. I first introduce her universal analysis of *any* as in Dayal (1998, 2004). But to appreciate her arguments, we first introduce briefly Kadmon & Landman's (1993) indefinite analysis of *any*.

#### 4.2.1 Kadmon & Landman (1993)

Kadmon & Landman proposed that *any* is an indefinite with two characteristics: widening and strengthening, as specified in (5):

(5) *Any CN* is the corresponding indefinite NP *a CN* with two additional semantic/pragmatic characteristics:

- a. Widening: In an NP of the form *any CN*, *any* widens the interpretation of the common noun phrase along a contextual dimension.
- b. Strengthening: *any* is licensed only if the widening that it induces creates a stronger statement.

This explains why *any* in (6a) is acceptable but not in (6b) as follows. *Any* as in (6a) is commonly known as NPI *any*.

- (6) a. I didn't see *any student*.  
 b. # I saw *any student*

*Any* in (6a) is good because it satisfies both widening and strengthening. Widening requires that students that are normally not included in the domain of quantification be considered. Strengthening requires that when the above widening is induced, a stronger statement must be generated. Specifically, in the case of (6a), the fact that the speaker didn't see a student in *the Arts & Sciences College* will entail that he didn't see a student in *the linguistics department*, assuming that the college has that department. That is, a stronger statement is produced when the domain is widened. This makes a contrast to (6b), where domain widening leads to a weakening rather than a strengthening of the



- b. A cat is hunting mice. -existential reading
- (9) a.  $\text{Gen}_x$  [cat (x) & x hunt mice] -generic reading
- b.  $\exists_x$  [ cat (x) & x hunt mice] -existential reading

The equation of FC *any* with a regular indefinite in a generic context makes it nothing special from NPI *any*. They are just indefinites in different environments. The universal force of FC *any* may come from binding of a generic operator, and the existential reading of NPI *any* may come from binding of an existential operator. What separates *any* indefinites from regular indefinites is domain widening: the former has it, but the latter doesn't.

This simple analysis unifies FC *any* with NPI *any* elegantly. However, it is challenged in Dayal (1998, 2004). Below I present Dayal's objections to this approach and introduce her alternative analysis in which *any* is taken to be a modalized universal quantifier.

#### 4.2.2 Dayal (1998, 2004): *any* as a universal

Dayal presents two main arguments against the variable-binding analysis of Kadmon and Landman. First, *any*-phrases don't get bound by *overt* quantificational adverbs (Q-adverbs). Thus it seems suspicious to assume that they may be bound by a *covert* generic operator. Second, contrary to what Kadmon and Landman's analysis would predict, FC *any* appears in contexts where regular indefinites do not get generic interpretations. Below we introduce the arguments in order.

First, as observed by Dayal, *any*-phrases differ from regular indefinites in their ability to allow binding of overt Q-adverbs. This is shown below:

- (10) a. A cat usually hunts mice. (Most cats hunt mice)  
 b. Any cat usually hunts mice. (\*Most cats hunt mice)
- (11) a. A lion is usually majestic.  
 b. \*Any lion is usually majestic.

In (10), the adverb *usually* in (a) may have both a bound reading and a frequency reading. On the bound reading, it is a generalization about most cats. On the frequency reading, it roughly means that cats in most cases hunt mice. This is different from (b) with *any*. In (b), the adverb has only the frequency reading but not the bound reading. As shown in (11), when the sentence involves an individual predicate where the frequency reading is no longer available, the statement with *any* becomes unacceptable. However, the corresponding statement with a regular indefinite is still good in this context. This is the case if the statement with a regular indefinite may have the bound reading in which *usually* quantifies over lions, but the statement with *any* may not. This shows that *any*-phrases are different from regular indefinites in that they are not bound by overt Q-adverbs. This being the case, it seems problematic to assume that they are bound by covert operators as proposed by Kadmon and Landman

Second, FC *any* appears in contexts where regular indefinites don't get interpreted generically. For example, the regular indefinite counterparts of (12) have only existential interpretations but not the generic readings, as shown in (13). However, *any* is allowed in

(12a) with *may* but not in (12b) with *must*. This is puzzling if FC *any* is an indefinite that is interpreted generically, because none of the sentences has a generic reading when the *any*-phrase is replaced by a regular indefinite.

- (12) a. You may eat any apple.  
       \*b. You must eat any apple.

- (13) a. You may eat an apple.  
       b. You must eat an apple.

In addition, the above *must* statement is acceptable when it is modified by a relative clause even if the indefinite counterpart has only the existential interpretation.<sup>48</sup>

- (14) You must eat any apple you bought.

Based on the above, Dayal concluded that FC *any* is not a generic indefinite, but is a modalized universal:

$$(15) \quad \textit{any} = \forall_{s,x} [P(s, x) \ \& \ C(s)] [Q(s, x)]$$

P and Q are functions from worlds/situations to sets of objects and C is the contextual variable that restricts the worlds/situations to those that we consider. By allowing *any* to quantify over both individuals and situations/worlds, she builds into *any* the feature of modality. In addition, she proposed the following *Contextual Vagueness* requirement, which has to be met at the level of the proposition for the *any* statement to be felicitous.

- (16) Contextual Vagueness:

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<sup>48</sup> This phenomenon is called subtriggering. See Dayal (1998) for detailed discussion of this phenomenon.



Any (A) (Op B) is felicitous iff  $A \cap B$  is not contextually salient in any relevant world; where Op may be  $\diamond, \square, !$  (permission),  $\imath$  (command) or null.

Below we show how this analysis works in the various contexts we discussed above. First, *any* in an episodic context is ruled out in the following way.

- (17) a. \* Yesterday John talked to any woman.  
 b.  $\forall_{s,x} [\text{woman}(x, s) \text{ and } C(s)] \quad \exists s' [s < s' \text{ \& yesterday}(s') \text{ \& talk}(j, x, s')]$

According to Dayal, (17) means that all possible woman situations extend into a situation located at a particular interval, namely yesterday in which John talked to the woman. And ‘there will be many situations that will render the statement false, for example, all those women situations that do not overlap with John’s existence’. She also points out that in ‘using an *any* phrase, the speaker chooses explicitly to talk about all possible situations but in making an assertion about a bounded time interval, she must focus on a restricted set of situations’.

Second, *any* in generic context has the following interpretation: ‘all situations  $s$  that have a cat in them generally extend into situations  $s'$  in which the cat hunts mice.’

- (18) a. Any cat hunts mice.  
 b.  $\forall_{s,x} [\text{cat}(x, s) \text{ and } C(s)] \quad [\text{Gen } s' [s < s' \text{ \& } C'(s')] \quad \exists y [\text{mice}(y, s') \text{ \& hunt}(x, y, s')]$

(18) involves two layers of generic quantification, one contributed by aspectual morphology and one contributed by *any*. According to her, the difference between this and its regular indefinite counterpart is that the former considers *all* situations whereas

the latter considers only the *typical/normal* situation.

Third, those examples that don't involve genericity are explained by means of *Vagueness Requirement*:

- (19) a. You may eat any apple.  
 b.  $\forall x$  [poss-apple (x)]  $\diamond$  [eat (you, x)]  
 c. A (possible empty) subset of the set of possible apples will be eaten
- (20) \*a. You must eat any apple.  
 b.  $\forall x$  [poss-apple (x)]  $\square$  [eat (you, x)]  
 c. Every member of the set of possible apples will be eaten
- (21) a. You must eat any apple you bought.  
 b.  $\forall x$  [ poss-apple (x) & buy (you, x) ]  $\square$  [eat (you, x)]  
 c. Every member of an undetermined/potentially unknown set will be eaten

(20) is ruled out because the combination of a command with the universal quantification requires that all possible apples be eaten in the actual world, violating the *vagueness requirement*. In contrast, the other two sentences are fine because 'the set of possible apples to be eaten in the actual world is not a determined set'.

Dayal's analysis incorporates Kadmon and Landman's basic insight about domain widening by allowing *any* to quantify over both individuals and situations. That is, *any* quantifies over all *possible* individuals rather than all *actual* individuals. But her analysis is different from Kadmon & Landman's in several ways. First, for her, *any* is not a variable that gets its quantificational force from binding of some external operators; it has

its own quantificational force. Second, the variable-binding approach draws on the parallelism between *any* indefinites and regular indefinites in generic contexts. This approach considers contexts where *any*-phrases differ from regular indefinites. Third, the variable-binding analysis of FC *any* comes from the analysis of NPI *any*; her analysis of FC *any* as a universal evolves from looking at it in its own right.

Having shown that *any* is reasonably characterized as a universal rather than a generic indefinite, next we introduce briefly the definite FCI *wh-ever*, attempting to separate a universal FCI from a definite one.

#### 4.2.3 Dayal (1997): *wh - ever* as a definite

Dayal (1997) discusses *wh-ever* free relative free choice (FRFC) such as those in (22).<sup>49</sup> According to her, the sentences in (22) have the *ignorance* readings: (a) means that regardless of what Mary cooks, she uses onions and (b) means regardless of what movie that is played at Avon, it makes a lot of money. That is, in both cases, the identity of the thing in question is ignored by the speaker. She further suggests that such reading can be tested by the use of *namely*. For example, in (23), FR with *ever* is not compatible with *namely* because it can't be the case that the speaker ignores the identity of the dish or the movie in question and at the same time, he knows the name of it. That is, we can't list specifically the individuals that are involved in the context.

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<sup>49</sup> See also Jacobson (1995), von Stechow (2000), Giannakidou (2005) & Vlachou (2007) for discussions of this type of FC.



In (26), (a) with a universal has only the distributive partitive reading but (b) and (c) with *wh-ever* or a definite have additionally the collective partitive reading. The distributive partitive reading means that Mary has read two thirds of every book in the series. The collective partitive reading means that Mary has read two thirds of the total number of the books in the series.

Based on the above, Dayal proposed that FR with *ever* is a definite. Its universal force comes from *ever* quantifying over the set of i(dentity)-alternatives to the world of evaluation. Her definition of *wh-ever* is given below:

(27) a.  $\text{whatever}_j$   $[\text{IP} \dots t_j \dots]$  denotes at  $w =$

$$\lambda Q \forall i. \text{alternatives} \in f(w)(s) [Q(i)(\iota x [P(i)(x)])]$$

where P is the property derived by abstracting over  $x_j$  in the IP denotation

b.  $f(w)(s) = \{w' : \forall p [s \text{ believes } p(w) \rightarrow p(w')]\}$

for a world of evaluation  $w$  and speaker  $s$ ,  $f(w)(s)$  is the set of worlds in which the speaker's beliefs about  $w$  hold

c. a world  $w' \in f(w)(s)$  is an  $i$ -alternative iff there exists some  $w'' \in f(w)(s)$  such that  $\iota x [P(w')(x)] \neq \iota x [P(w'')(x)]$

In (27), (a) says that FR denotes a set of properties that hold of the referent that satisfies the description P in all relevant  $i$ -alternatives at  $w$ . (b) makes explicit the modal base, the set of worlds in which the speaker's belief holds. (c) specifies  $i$ -alternative as a world in which the denotation of the FR varies as it is in a different world in which the speaker's belief holds.

In this approach, the ignorance reading of (28) in episodic contexts is interpreted in (29). It says that ‘in all the relevant *i*-alternatives at *w*, the dish being cooked by Mary uses onions.’ In other words, the assertion holds regardless of the identity of the dish. The FC reading of (30), on the other hand, comes from a combination of (28) with generic tense. This is shown in (31).

(28) Mary is cooking something. Whatever she is cooking uses onions.

(29) a.  $\forall_i \text{ alt} \in f(w) (s) [\text{uses-onions} (i) (\iota x [\text{cooking} (i) (x) (m)])]$

b.  $i\text{-alt}_1 : \iota x [\text{cooking} (i) (x) (m)] = \text{ratatouille}$

$i\text{-alt}_2 : \iota x [\text{cooking} (i) (x) (m)] = \text{lentils}$

$i\text{-alt}_3 : \iota x [\text{cooking} (i) (x) (m)] = \text{goulash}$

(30) Whatever Mary cooks uses onions.

(31)  $\forall_w [C(w)] [\forall_i \text{ alt} \in f(w) (s) [\text{uses-onions} (i) (\iota x [\text{cooking} (i) (x) (m)])]]]$

According to Dayal, the difference between (29) and (31) is that the world variable here is bound. The contextual variable *C* serves to restrict the quantification to relevant situations of our consideration. (31) gets us the FC reading because it ‘requires truth to be evaluated at all contextual relevant worlds/situations in which Mary cooks something.’ This is stronger than a regular generic sentence because *ever* ‘forces evaluation at *i*-alternatives of every world.’

To sum up, FR with *ever* is a definite. It gets its universal force from universal quantification over the set of identity-alternatives to the world of evaluation. The identity alternatives are epistemic alternatives introduced by *ever*, which requires variation of the

denotation of the FR in all the relevant worlds.

This makes *wh-ever* different from FC *any* in two ways. First, FC *wh-ever* is a definite but FC *any* is a universal. Second, FC *wh-ever* may draw on some epistemic modality but FC *any* doesn't. In particular, the former may quantify over the identity alternatives of the FC denotation to the world of evaluation but *any* may not. Instead, it quantifies over all *possible* individuals/entities of the relevant kind.

Having introduced the two types of FCIs in English, we now turn to Chinese. We will apply the diagnostics to Chinese FC structures *renhe...dou* and *wh...dou* to see how they are similar to or different from English FCIs. We will also see how the two structures are different from each other. 4.3 discuss *renhe...dou* and 4.4 looks at *wh...dou*.

### 4.3 *Renhe...dou* as a universal.

In this section, we focus on *renhe...dou*. We show that it is a universal, not a generic indefinite or a definite. We first present evidence that *renhe...dou* is like universal *any*. Then we provide language-internal evidence showing that *renhe* resembles universal *mei* 'every'.

#### 4.3.1 Similarities between *renhe...dou* and universal *any*

*Renhe...dou* behaves like *any* in the following four respects. First, *renhe...dou* may take *nearly/almost* modification, in contrast to a definite that doesn't.

(32) a. Ni rang wo zuode chabuduo/jihu renhe yijianshi wo dou  
zuo le.

you let me do DE nearly/almost any one-CL matter I dou  
do ASP

‘I did nearly /almost anything you told me to do.’

b. Ni rang wo zuode \*chabuduo/ \*jihu zhexie shi, wo dou  
zuo le.

you let me do DE nearly/almost these matter I dou  
do ASP

‘I did \* nearly /\*almost the things you told me to do.’

Second, *renhe...dou* aligns with the universals in partitive structures in having the distributive partitive reading, but a definite has the collective partitive reading. As shown in (33), (33a) means that the speaker has read 2/3 of every book on the list. (33b) means that the speaker has read 2/3 of the total number of books and may have left some books on the list totally untouched.

(33) a. Zhege danzishang de renheyibenshu, wo dou dule 2/3.  
this CL list on DE any one-CL book, I dou read ASP 2/3

‘I read 2/3 of any book on the list’

b. Zhege danzishang de zhexie shu, wo dule 2/3.  
this CL list on DE these book, I read ASP 2/3



'I read 2/3 of the books on the list'

Third, *renhe*+ *dou* behaves like universal *any* with respect to the adverbs of quantification. This is seen below. As discussed in Lin (1996), the adverbs *tongchang*/*youshihou* 'usually/sometimes' in the following example in (34) can only have the bound readings but not the frequency readings, because it doesn't make sense to say that a quadratic equation sometimes has two different solutions and sometimes doesn't. This means that the indefinite has to be bound by the Q-adverbs. But given what we know about *any* from our earlier discussion, *any* is not bound by quantificational adverbs. This means the corresponding *any* sentence is unacceptable. So if *renhe* is like *any*, then *renhe* should not be acceptable as well. This is the case. As seen in (35), when *renhe* is added in front of the indefinite, the sentence is ungrammatical. And in examples like (36), the adverbs can only have the frequency readings but not the bound readings:

(34) Yi ge erci fangchengshi    tongchang/youshihou    you liangge butongde    jie  
 one-CL quadratic equation    usually/sometimes    have two-CL different solution  
 'A quadratic equation usually has two different solutions.'

(i) Most/Some quadratic equations have two different solutions

(ii) \*Quadratic equations in most cases/in some cases have two different solutions

(35) \*Renheyi ge erci fangchengshi    tongchang/youshihou    dou    you liangge  
 butongde    jie  
 any one-CL quadratic equation    usually/sometimes    dou have two-CL

different solution

‘Any quadratic equation usually/sometimes has two different solutions.’

- (36) renhe yige ren            youshihou/ou'er            dou fan cuowu  
 any one-CL person    sometimes/occasionally    dou    make mistake

(i) \* Some people make mistakes’

(ii) ‘People sometimes make mistakes’

Finally, like universal *any*, *renhe... dou* is licensed in contexts where regular indefinites don't get generic readings. (37) is the parallel paradigm of the earlier examples in (19)-(21). (a) is good with the possibility modal but (b) is bad with a necessity modal. But when (b) is modified by a relative clause, the use of *renhe* is good, as in (c). But none of the corresponding indefinite sentences has a generic reading, as shown in (38).

- (37) a. Renhe yiimen ke            ni            dou    keyi    xuan  
           any one-CL course        you        dou    may    choose

‘You may choose any course.’

- \*b. Renhe yimenke            ni            dou    bixu    xuan  
           any one-CL course        you        dou    must    choose

‘You must choose any course.’

- c. Wang laoshi    jiaode    renhe yimen ke            ni            dou    bixu    xuan  
           Wang teacher teach DE any one-CL course    you        dou    must    choose

‘You must choose any course taught by teacher Wang.’

- (38) a. You yimen ke ni keyi xuan  
 exist one-CL course you may choose  
 ‘You may choose a course.’
- b. You yimenke ni bixu xuan  
 exist one-CL course you must choose  
 ‘You must choose a course.’
- c. Wang laoshi jiaode yimen ke ni bixu xuan  
 Wang teacher teach DE one-CL course you must choose  
 ‘You must choose a course taught by teacher Wang.’

Based on the above similarities between *renhe...dou* and universal *any*, I conclude that *renhe...dou* is a universal. As discussed in 4.2, *any* can be reasonably characterized as a universal FCI rather than a generic indefinite FCI or a definite FCI. The fact that *renhe...dou* is so similar to *any* suggests that the same analysis could well apply to it. Furthermore, as we see below, there is language internal evidence to support this.

#### 4.3.2 Similarities between *renhe* and *mei*

As introduced in chapter 2, *mei*-NP ‘every’ is a universal. Below we present some parallelisms between *renhe* and *mei* and suggest that *renhe...dou* be handled the way *mei...dou* is dealt with.

*Renhe* is similar to *mei* in both preverbal and postverbal positions. In the

preverbal position, both require the use of *dou* but in the postverbal position, neither of them needs *dou*.<sup>50</sup> This is shown in (39) and (40) respectively. In addition, when the object in (41) is preposed to a preverbal position, *dou* is needed as in (41).<sup>51</sup>

- (39) Renheyige/ Meiyige yundongyuan    \*(dou)    keneng    de    diyi  
       any one-CL/every one-CL    player    dou    possible    get    # 1  
       ‘Any/Every player may get the first place.’
- (40) Ni    (\*dou)    keyi    canjia    renhe yige/meiyige    kaoshi  
       you    dou    can    attend    any one-CL/every one-CL    exam  
       ‘You can attend any/every exam.’
- (41) Ni    renheyige/meiyige    kaoshi    \*(dou)    keyi    canjia  
       you    any one-CL/every one-CL    exam    dou    can    attend  
       ‘You can attend any/every exam.’

In dealing with the subject-object asymmetry of *mei*-NP, Yang (2001) proposes that there is a covert D-operator on the V in the object position corresponding to an overt D-operator *dou* on the VP in the preverbal position. Given the parallel distribution between *renhe*-NP and *mei*-NP in both pre- and post-verbal positions, I will assume that whatever Yang has proposed for *mei* can be applied to *renhe* as well.<sup>52</sup>

<sup>50</sup> In fact, the use of *dou* results in ungrammaticality when *renhe/mei* is in the object position, as shown in (i) below.

(i) \*Ni    dou    keyi    canjia    renhe yige/meiyige    kaoshi  
       you    dou    can    attend    any one-CL/every one-CL    exam  
       Intended: ‘You can attend any/every exam.’

<sup>51</sup> Cheng & Giannakidou (2005) also mention the issue of *dou* in both pre- and post-verbal positions when they talk about FC *any*.

<sup>52</sup> As we will see in 4.4, *wh*-elements in the object position have only interrogative readings but not FC/universal readings. Thus the discussion of subject/object asymmetry doesn’t apply to *wh*-elements.

In addition, the following evidence from *lian* modification seems to support this. Recall the *lian...dou* constructions we discussed in chapter 3, where we claimed that *dou* is scalar. As seen in (42), however, neither *renhe* nor *mei* can take *lian* ‘even’ modification.

- (42) Lian \*mei /\*renhe yige xuesheng dou keyi canjia zhege kaoshi.  
 even every/ any one-CL student dou can attend this-CL exam  
 ‘Even \*every /\*any student can take this exam.’

This makes a contrast to a definite or an indefinite. As in (43), either a definite or an indefinite can take *lian*. This seems to support the claim that *renhe*-NP is a universal but not a definite or an indefinite. In addition, the fact that *renhe* can’t be preceded by *lian* suggests that *dou* in *renhe...dou* is not scalar.

- (43) a. Lian zhe ge xuesheng dou mei canjia zhege kaoshi.  
 even this-CL student dou not attend this-CL exam  
 ‘Even this student didn’t even take the exam.’  
 b. Lian yige xuesheng dou mei canjia zhege kaoshi.  
 even one-CL student dou not attend this-CL exam  
 ‘Not even one student took the exam.’

Further evidence for the analysis of *renhe* as universal comes from a consideration of once-only predicates. As seen in (44), neither *mei...dou* nor *renhe... dou* is acceptable in the sentence with predicates like *shasi* ‘kill dead’, but the corresponding sentence with a definite is perfectly fine. This is because the killing can be the collective

efforts of the plural individuals in the case of a definite, but such reading is not available for *mei...dou* and *renhe... dou*. The latter are only compatible with the distributive reading, which is impossible in this context because a person can't be killed repeatedly.

- (44) a. \*meige /\*renhe yige      hentade ren      dou    zai gongyuan    shasile    ta  
           every-CL/ any-one-CL hate him DE person    dou    at park    kill dead ASP him  
           ‘Everyone/Anyone who hates him killed him in the park.’
- b.    Zhexie      hentade ren                      zai gongyuan      shasile    ta  
       these      hate him DE person      at park                      kill dead ASP    him  
       ‘Those who hate him killed him in the park.’

To sum up, *renhe...dou* is a universal not a definite or an indefinite. In addition, the parallels between *renhe...dou* and *mei...dou* suggest that the former can be reasonably dealt with the way *mei...dou* is handled. That is, *dou* can be treated as distributive and the universality comes from *renhe*.<sup>53</sup> As we will see below, this doesn't seem to be the case for *dou* in *wh...dou* constructions.

#### 4.4. Is *wh...dou* like *renhe...dou*?

Above we showed that *renhe...dou* is like universal *any* or *mei*. But how about *wh...dou*? Is it like *renhe...dou*? In this section, we show that *wh...dou* is identical to *renhe...dou* in many aspects but they also have crucial differences. We suggest that

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<sup>53</sup> As we will introduce shortly, Lin (1996) also defends the distributive analysis of *dou* in *wh...dou*. But he doesn't discuss *renhe...dou*. The data about *renhe...dou*, however, lead me to believe that his proposal applies to *renhe...dou*.

*wh...dou* be treated separately from *renhe...dou*.

#### 4.4.1 Similarities between *wh...dou* and *renhe...dou*

As shown in (45)-(48), *wh...dou* is like *renhe...dou* in all of the following aspects:

(i) it takes *almost/nearly* modification, (ii) it has only the distributive partitive reading in a partitive structure, (iii) it is not bound by a quantificational adverb, and (iv) it is licensed in contexts where regular indefinites are not interpreted generically.

##### (45) *almost/nearly* modification

Ni rang wo zuode chabuduo/jihu najian/shenme shi wo dou zuo le.  
 you let me do DE nearly/almost which-CL/what matter, I dou do ASP  
 ‘I did nearly /almost anything you told me to do.’

##### (46) partitive structure

Zhege danzishang de naben/shenmeshu , wo dou dule 2/3.  
 this CL list on DE which-CL/what book, I all read ASP 2/3

(i) For every book on the list, I read 2/3 of it.

(ii) \*I read 2/3 of the total number of books on the list.

##### (47) not bound by adverbs of quantification

Nage erci fangchengshi \*tongchang/ \*youshihou dou you liangge  
 which CL quadratic equation usually/sometimes dou have two-CL  
 butongde jie  
 different solution

‘Any quadratic equation usually/sometimes has two different solutions.’

(48) Licensed in non-generic contexts

Na ben shu                    ni        dou    keyi/\* bixu    mai  
 which –CL book            you        dou    may/ must        buy  
 ‘You may/ \*must buy any book.’

Despite the similarities between *wh...dou* and *renhe...dou* as listed above, there are some differences between them. We will talk about them below.

#### 4.4.2 Differences between *wh...dou* and *renhe...dou*

In this subpart, we show two main differences between *wh*-NP and *renhe*-NP. One is their interpretation independently of *dou*. The other is their ability to take *lian* modification.

First, *wh*-sentences have only interrogative meanings but not the FC readings when *dou* is absent, but *renhe* sentences may have the FC readings with the absence of *dou*. This is shown in (49) and (50) below. In (49), sentences with *wh*-elements have only interrogative interpretations regardless of whether *wh*-elements are in the pre-verbal position or in the post-verbal position. In contrast, *renhe* sentences in (50) are not acceptable without *dou* in the preverbal position, but they are acceptable in the post-verbal position and in this case they have FC readings.

- (49) a. Shei        neng    jiejue    zhege    wenti.                    –<sup>ok</sup>*wh*,preverbal, \*FC  
           who        can     solve    this-CL problem  
           (i) ‘Who can solve this problem?’



(ii) \*‘Anyone can solve this problem.’

b. Ta neng jiejie nage wenti. –<sup>ok</sup>*wh*, postverbal, \*FC

he can solve which-CL problem

(i) ‘Which problem can he solve?’

(ii) \*‘He can solve any problem.’

(50) a. \*Renheyigeren neng jiejie zhege wenti. –\**renhe*, preverbal, \*FC

any one-CL person can solve this-CL problem

Intended meaning: ‘Anyone can solve this problem.’

b. Thege jiqi neng huida renheyige wenti. –<sup>ok</sup>*renhe*, postverbal, FC

This-CL machine can answer any one-CL question

‘The machine can answer any questions.’

In addition, unlike *renhe...dou* that can’t take *lian* modification as mentioned above, *wh...dou* can. This is seen in (51).

(51) a. Lian shei dou kande chulai...

even who dou look out

‘Anyone can tell that...’

b. Lian shei dou dei zunshou jiaotong guize.<sup>54</sup>

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<sup>54</sup> Note that this sentence is acceptable without *lian*. That is, it is not the addition of *lian* that makes the *must* statement acceptable. This is different from (i), where the *must* statement is not acceptable.

(i) \*Na ben shu ni dou bixu mai  
 which –CL book you dou must buy  
 ‘You must buy any book.’

even who dou must obey traffic rules

‘Anyone must obey the traffic regulations.’

And *dou* can also be replaced by *ye* in the above sentences without affecting their meanings, as shown in (52).

(52) a. Lian shei dou/ye hande chulai.

even who dou/also look out

‘Anyone can tell that...’

b. Lian shei dou/ye dei zunshou jiaotong guize.

even who dou/also must obey traffic rules

‘Anyone must obey the traffic regulations.’

The fact that a *wh*-element doesn’t have a universal interpretation without *dou* indicates that the source of the universality for *wh...dou* must come from *dou*. In addition, the compatibility of *wh...dou* with *lian* further suggests that the universality of *wh...dou* may be related to the scalarity of *dou* in *lian... dou* as we discussed in chapter 3. In fact, assuming the possible involvement of scalarity in the composition of free choice expressions is not implausible because cross-linguistically many languages use scalar particles to express free choice meanings. For example, Haspelmath (1997) has provided the following examples in which the free choice expressions are composed of a *wh*-element and a scalar particle. These examples are not directly from Haspelmath (1997) but from Shank (2004):

(53) Raamu **ellig-uu** hoodaanu

Ramu where-even may go

‘Ramu may go anywhere.’

- Kannada

(54) **Pi-pis** kay prolema-ta-qa atinman-mi

who even this problem-acc-top solves

‘Anyone can solve this problem’

- Ancash Quechua

Thus whatever accounts for the FCIs in the languages that employ the same particles should be applicable to the cases in Chinese with *wh...dou*. Perhaps Lahiri’s (1998) approach to Hindi FCIs is a possibility to deal with *wh...dou* in Chinese. But I will leave the formal analysis of *wh...dou* for future research. However, if the assumption is right that FC here is related to scalarity, then it indicates that Chinese FC may be derived through either scalarity or distributivity, providing further support for our claim that Chinese has two *dou*’s.

Above I have identified two overlapping but distinct FCI items, both having universal (rather than definite) force. In that sense, the two do not separate along the lines of the two FCI in English, *any* and *wh-ever*. The characterization of *renhe* in terms of *any* seems relatively straightforward, but that the characterization of *wh...dou* cannot be in terms of *any*, nor can it be in terms of *wh-ever*. However, given what we have discovered about *dou* in previous chapters, the behavior of *wh...dou* is not surprising. It involves scalar *dou*. That being said, it suggests that both distributive *dou* and scalar *dou*

are used in the making of FC in Chinese. And as we see below, the stress pattern associated with FC structures further supports this.

We mentioned in chapter 3 that distributive *dou* is stressed and scalar *dou* is not. This stress factor is seen to apply to *renhe...dou* and *wh...dou* as well. We show below that *dou* in *wh...dou* has to be unstressed but *dou* in *renhe...dou* doesn't. We look at *wh...dou* first.

(55) a. Zhe ben shu      shei dou<sup>unstressed</sup> xiang kan  
           this CL book    who    dou    want    read  
           ‘Anyone wants to read this book.’

b. \*Zhe ben shu      shei dou<sup>stressed</sup> xiang kan  
           this CL book    who    dou    want    read  
           Intended ‘Anyone wants to read this book.’

(56) a. Zhe xie shu      shei dou<sup>unstressed</sup> xiang kan  
           this CL<sup>pl</sup> book    who    dou            want    read  
           ‘Anyone wants to read these books.’

b. Zhe xie shu      shei dou<sup>stressed</sup> xiang kan  
           this CL<sup>pl</sup> book    who    dou    want    read  
           (i) ‘Who wants to read all of these books?’  
           (ii) \*‘Anyone wants to read all of these books’

(55) and (56) are the same except that the former involves a singular argument *zhebenshu* ‘this book’ and the latter a plural argument *zhexieshu* ‘these books’. As seen in

(55a) and (56a), both sentences are good when *dou* is unstressed. However, this is not case when *dou* is stressed. As shown in (55b), when *dou* is stressed, the sentence is unacceptable. And in (56b), when the argument is plural, stressed *dou* gives rise to the sentence the distributive reading but not the FC reading. That is, (56b) has only the distributive meaning in (i) but not the FC-distributive meaning in (ii). Interestingly, the FC-distributive reading seems possible when both *dou*'s are used, as shown in (57) below.

- (57) zhe xie shu      lian shei dou<sup>unstressed</sup> dou<sup>stressed</sup> xiang kan  
 this CL<sup>pl</sup> book    even who dou      dou      want    read  
 ‘Anyone wants to read all of these books’

While *dou* in *wh...dou* can't be stressed to get the FC reading, *dou* in *renhe...dou/mei...dou* can. As shown below, *dou* in the corresponding sentences with *renhe/mei* can either be unstressed (maybe more natural) or stressed without affecting the meanings of the sentences:

- (58) Zhe ben shu      renheren/meigeren      dou<sup>unstressed</sup> /dou<sup>stressed</sup> xiang kan  
 this CL book      any person/every CL person    dou      want    read  
 ‘Anyone/Everyone wants to read this book.’

- (59) Zhe xie shu      renheren/meigeren      dou<sup>unstressed</sup> /dou<sup>stressed</sup> xiang kan  
 this CL<sup>pl</sup> book      any person/every CL person    dou      want    read  
 ‘Anyone/Everyone wants to read these books.’

Thus *wh...dou* seems to require a separate treatment from *renhe...dou*. But at the

same time, they are related in that both distributive *dou* and focus *dou* are used in the compositions of free choice expressions in Chinese.

In the rest of the chapter, I will look at the analyses of Lin (1996) and Cheng and Giannakidou (2005) to see to whether their analyses are successful in dealing with the data presented above regarding *renhe...dou* and *wh...dou* structures.

## 4.5 Previous analyses of Chinese FCI

### 4.5.1 Lin (1996): *dou* is a distributive operator

Lee (1986) and Cheng (1991, 1995) propose that *dou* is a universal quantifier.<sup>55</sup> For example, Cheng assumes that *dou* in (60) adjoins *shei zuo shenme* ‘who does what’ as a whole, and unselectively binds both *wh*-phrases to yield the universal reading of the sentence. That is, *wh*-phrases are Heimian indefinites that lack inherent quantificational force and *dou* binds the variables provided by the *wh*-phrases.

- (60) Shei zuo shenme dou gen wo wuguan  
 who dou what dou with me no-relation  
 ‘For all x, y, that x does y has no relation with me.’

However, Lin presents the following three pieces of evidence to argue against this variable binding approach. First, *dou* doesn’t really behave like an adverb of quantification. For instance, in (61), an example we introduced earlier, the adverbs of

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<sup>55</sup> Lee (1986), Cheng (1991, 1995) and Lin (1996) focus on *wh...dou* without discussing *renhe...dou*.

quantification may have bound readings: most or some quadratic equations have two different solutions. But the replacement of *dou* won't allow the bound reading to mean all quadratic equations have two different solutions. So if *dou* is an adverb of quantification, it is puzzling why *dou* can't quantify over the variable provided by the indefinite.

(61) Yi ge erci fangchengshi tongchang/youshihou/ \*dou you liangge

butongde jie

one-CL quadratic equation usually/sometimes/\*dou have two-CL

different solution

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

Second, *wh*-phrases in *wh...dou* constructions may occur with *ye* 'also', especially when the sentence is negative as observed in Yu (1965), Lü (1980), Ma (1982), Zhu (1982) etc. It is not clear how the binding approach explains the *dou/ye* alternation.

(62) a. Shenme kunnan dou/ye neng kefu

what difficulty dou/also can overcome'

'We can overcome any difficulty.'

b. Ta shenme dou/ye buchi

he what dou/also not eat

'He doesn't want to eat anything.'

Third, *wh...dou* doesn't appear in extensional contexts and it is not clear how the binding approach deals with this, either.

- (63) \* a. Shei dou zai fangjian li  
 who dou PROG room-inside  
 ‘Anyone is in that room’
- \*b. Shei dou yijing likai le  
 who dou already leave-ASP  
 ‘Anyone already left.’

To avoid these problems while maintaining a uniform analysis of *dou* as a distributive operator as it is in the context of definite plurals, Lin proposes that *wh... dou* constructions are elliptical *wulun...dou* ‘no matter’ constructions. That is, they in fact involve a silent *wulun*, based on the observation that *wh*-phrases in *wh...dou* can be optionally preceded by words like *buguan*, *wulun* or *bulun* with the meaning similar to English *no matter* (Yu 1965, Ma 1982, Tang 1981, Shao & Zhao 1989).<sup>56, 57</sup> This is shown below.

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<sup>56</sup> He also talks about what he calls ‘sentential *wulun* constituents’ such as the following. We will focus on nominal *wulun* sentences here.

- (i) (Wulun) ni zuoshenme, wo dou mei yijian  
 no matter you do what I dou not opinion  
 ‘No matter what you do, I won’t have an opinion.’
- (ii) (Wulun) ni yaoqing shei, wo dou hanying ta  
 no matter you invite who I dou welcome him  
 ‘No matter whom you invite, I will welcome him.’

<sup>57</sup> He glosses *wulun...wh* as ‘no matter *wh*-’ but he mentions in his footnote that *no matter wh-* is like free-choice *any*-NP. So I gloss the sentences as *anyone* and *any difficulty* respectively.



- (64) a. (Wulun) shei dou keyi lai.  
 no matter who dou can come  
 ‘Anyone can come.’
- b. (Wulun) shenme kunnan ta dou neng kefu.  
 no matter what difficulty he dou can overcome  
 ‘He can overcome any difficulty.’

*Wulun*, according to Lin, is a union formation operator. It takes a set of sets of objects and forms the generalized union over that set. For instance, *wulun shei* ‘no matter who’, in this approach, will denote a generalized union over a set of sets of humans, as shown in (65) below.

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

Since the union can be taken as a plural entity, the usual semantics of *dou* as a distributive operator can be applied.<sup>58</sup> In the meantime, he also points out that the *dou/ye* alternation raised earlier can be related to *wulun* constructions as well because *dou*

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<sup>58</sup> Lin distinguishes *dou* as a distributive operator from that as a universal quantifier although both induce a universal quantification. According to him, a universal quantifier can be prefixed to an open formula  $F(x)$  to form into  $\forall x F(x)$  to quantify over the variable  $x$ , but a distributive operator can't. Instead, the latter must relate a property  $P$  to a plural referent, distributing the property over every atomic part of the plural referent.

can alternate with *ye* in *wulun* sentences

- (66) a. Wulun shenme kunnan , ta dou/ye neng kefu<sup>59</sup>  
 no matter what difficulty he dou/also can overcome'  
 'He can overcome any difficulty.'
- b. Wulun shenme ta dou/ye buchi  
 no matter what he dou/also not eat  
 'He doesn't want to eat anything.'

In addition, he attributes the incompatibility of *wh...dou* in episodic contexts to the fact that 'The *wh*-phrases selected by *wulun* must denote possible individuals'. That is, the universal quantification is over possible individuals but not over actual individuals.

To sum up, Lin shows clearly that *dou* doesn't bind variables provided by indefinites. He also successfully extends the distributive analysis of *dou* to *wh...dou* constructions by relating the latter to elliptical *wulun* constructions. But as he points out he doesn't explain why *dou* can alternate with *ye* and how the universal force is derived in the case of *ye*. However, if it is right that the *dou/ye* alternation in *wh...dou* actually involves the construction of *lian* as we indicated in 4.4, then the alternation can be dealt with the way *lian...dou/ye* is handled in chapter 3. On the other hand, he doesn't discuss *renhe...dou*. But from what we have seen above, *renhe...dou* seems to involve distributivity. Thus his analysis may well apply to that construction.

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<sup>59</sup> I added the subject *ta* 'he' to his original sentence.

#### 4.5.2 Cheng & Giannakidou (2005): *dou* is an iota operator

Cheng & Giannakidou (2005) is another detailed study of FCIs in Chinese. They characterize three paradigms of ‘wh-indeterminates’ in Chinese as FCIs: bare *wh*’s, *na*-CL NP ‘which-CL’ and *renhe*-NP ‘any’ and make the following claims: (i) The three paradigms of FCIs can be uniformly treated as intensional indefinites following Giannakidou (2001). (ii) The three paradigms are different in intensionality (whether sensitive to episodocity): bare *wh*’s doesn’t involve intensionality, the latter two types do. (iii) The role of *dou* is that of an iota operator, contributing to the definiteness of the FCIs. Below I introduce briefly their assumptions about the semantics of FCIs and about Chinese FCIs.

Giannakidou (2001) takes FCIs as subtypes of polarity items sensitive to (non)veridicality.<sup>60</sup> In her framework, FCIs are restricted to nonveridical and non-episodic contexts. And semantically, they are indefinites. Her analysis of FCIs follows that of Kadmon & Landman (1993), but she assumes additionally that FCIs have

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<sup>60</sup> (Non)veridicality is defined in relation to a set of possible worlds that are epistemically accessible to the speaker:

- (i) Relativized (non)veridicality for propositional operators

Let  $c$  be a context, which contains a set  $M$  of models relative to an individual  $x$ .

- (a) A propositional operator  $Op$  is veridical iff  $[[Op\ p]]_c = 1 \rightarrow [[p]] = 1$  in some epistemic model  $M_E(x) \in c$ ; otherwise  $Op$  is non-veridical.  
 (b) A nonveridical operator  $Op$  is antiveridical iff  $[[Op\ p]]_c = 1 \rightarrow [[p]] = 0$  in some epistemic model  $M_E(x) \in c$

the following three features: intensionality, maximality, and variation.

By intensionality, she means that a FC determiner intensionalizes the NP argument. As in (67), a FC determiner contains a dependent world variable. When it applies to a NP, it returns an intensionalized property.

$$(67) \llbracket \text{Det}_{\text{FC}} \rrbracket = \lambda P_{\langle e, t \rangle} \lambda w \lambda x [P(x)(w)]$$

FCIs may also be maximalized depending on whether or not there is an expression that contributes to maximality. For example, Greek *opjosdhipote* can be indefinite or definite depending on whether it modifies an NP argument or a CP argument. When it takes a NP (*opjosdhipote fititis* ‘any student’) it is an indefinite, and when it takes a CP (*opjosdhipote erthi sto parti* ‘whoever came to the party’) it is a definite. It is suggested that the above indefinite/definite difference is reflected in English between *any* and *wh-ever*: *any* that takes a NP argument is an indefinite and *wh-ever* that takes a CP argument is a definite.

The third component of FCIs is variation: the value of the variable contributed by the FCI must vary from one world from another. This is captured by adopting the notion of i-alternatives from Dayal (1997). In (68), i-alternatives are worlds in which the FCI variable is assigned distinct values.

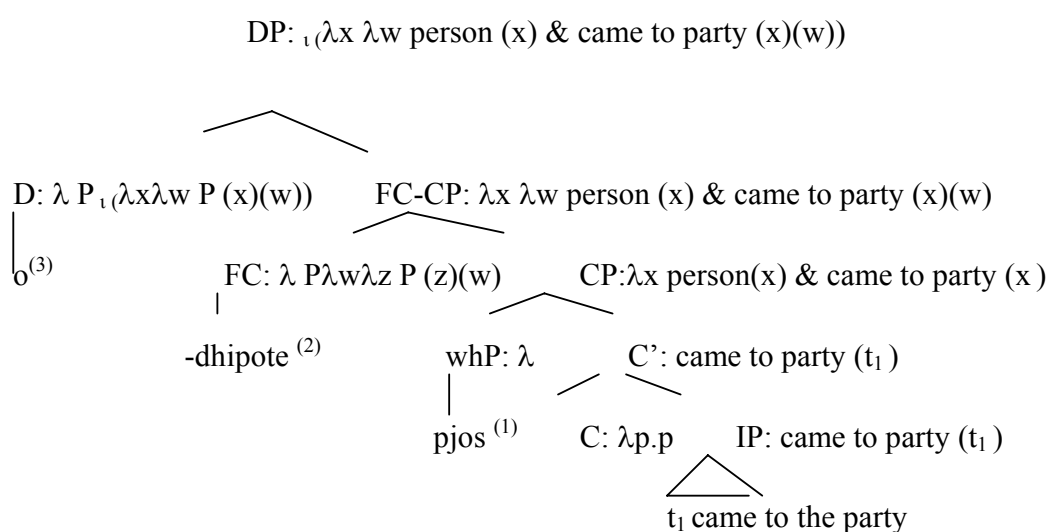
(68) i-alternatives:

A world  $w_1$  is an i-alternative wrt  $\alpha$  iff there exists some  $w_2$  such that  $[[\alpha]]^{w_1} \neq [[\alpha]]^{w_2}$ , where  $\alpha$  is a free choice phrase.

Based on the above, (69) involving Greek definite FCIs is computed as (70).

- (69) o-pjos-dhipote erthi sto parti  
 det-wh- FC came to the party  
 ‘Who(ever) came to the party.’

(70) Free choice FR



According to Giannakidou, the wh-word *pjos*<sup>(1)</sup> denotes a set of individuals. FC *dhipote*<sup>(2)</sup> intensionalizes the property provided by the CP argument. FC-CP is an intensionalized FC-FR set: a function from a set of individuals to a world such that *x* is a person and came to the party in *w*. The determiner *o*<sup>(3)</sup> is an iota. When it combines with FC-CP, it yields the maximal set of persons that came to the party in *w*. Since the input of the iota is a function from individuals to possible worlds, the FC-set will include both actual and possible individuals. Thus the FR has the domain widening effect: the individuals that are in less stereotypical or less accessible alternatives may be considered.

Against this background, Cheng and Giannakidou claim that Chinese *wh...dou*

and *renhe...dou* are definite FCIs comparable to Greek definite FCI *o-pjos-dhipote*. They also consist of three components: intensionality, wh-core and maximality. The parallel between the two languages is given below:

(71) Greek: *o---pjos---dhipote*:                   iota---wh---FC

(72) Chinese: a. *ren---he---dou*:                   FC---wh---iota

b. (*wulun*)---wh---*dou*:                   FC---wh---iota

In (72a), *ren* ‘regardless’ provides intensionality, *he* ‘Classical Chinese *which*’ is the wh-core and *dou* is the iota that provides maximality. In (72b), *wh...dou* has the same components as *renhe...dou* assuming *wulun* provides the intensionality following Lin (1996). This way, *ren* and *wulun* are put on a par with FC *dhipote* that intensionalizes the NP argument and *dou* is taken to be identical to the iota *o*, as shown in (73).

(73) a.  $\llbracket \textit{ren-/wulun-/ -dhipote} \rrbracket_{FC} = \lambda P_{\langle e,t \rangle} \lambda w \lambda x [P(x)(w)]$

b.  $\llbracket \textit{dou/o} \rrbracket = \lambda P_1 (\lambda x \lambda w P(x)(w))$

In this approach, FCIs in Chinese are always intensional, thus they are not legitimate in episodic contexts.<sup>61</sup> In addition, Chinese is like Greek (or English) in that FCIs are either indefinite or definite. But unlike Greek (or English) where FCIs are

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<sup>61</sup> According to them, those that appear in episodic contexts such as the ones in the following examples are not FCIs because they can’t be modified by *jihu* ‘almost’, following Davison’s (1981) diagnostic of FC reading.

- (i) ta mai-le (\*jihu) shenme /renhe shu ma?  
 he buy-ASP almost what /any book Y/N  
 ‘Did he buy anything/any book?’
- (ii) ta mei mai (\*jihu) shenme /renhe shu ma?  
 he not buy almost what /any book Y/N  
 ‘He didn’t buy anything/any book.’

definite when they take CP arguments as mentioned above, the definiteness function in Chinese comes from *dou* regardless of the kind of arguments it takes.<sup>62</sup> In other words, *renhe...dou* and *wh...dou* are definite FCIs. They provide the following arguments to support the definite analysis of *dou*.

First, as in (74), ‘the presence of *dou* in (b) has an effect reminiscent of the usual widening effect that has been noted for FC’. In particular, (a) is ‘compatible with the reading that there is no one in particular that Boling wants to see’ but (b) with *dou* is ‘only compatible with the reading that there is absolutely no one at all that Boling wants to see.’

- (74) a. Boling      bu xiang jian      nage ren.  
           Boling      not want see      which-CL person  
           ‘Boling doesn’t want to see any person (in particular).’
- b. Boling      na-ge ren                      dou      bu xiang jian  
           Boling      which-CL person      all      not want see  
           ‘Boling does not want to see any person at all’

Second, the indefinite/definite contrast between *any* and *wh-ever* is reflected in Chinese between *ruguo*-conditionals ‘if-conditionals’ and *dou*-conditionals, as shown in (75) and (76). *Any* in (75a) is indefinite and can be ‘uttered when the phone is not ringing.

And it is compatible with a situation in which no call eventually comes through’. But

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<sup>62</sup> They also distinguish bare *wh* from which-CL-N in that the former is used as a regular indefinite but the latter is always a FCI when not used as an interrogative. I refer the readers to their paper for detailed discussion about this.





(77) *Wh/Renhe...dou* takes *almost/nearly* modification, but a definite doesn't.

Ni rang wo zuode chabuduo/jihu renhe /shenme/ \*zhexie shi wo dou  
zuo le.

you let me do DE nearly/almost any/what /these matter, I dou  
do ASP

‘I did nearly /almost anything/\*the things you told me to do.’

(78) *Wh/Renhe...dou* has different readings in a partitive structure from a definite:

a. Zhege danzishang de henhe/na yiben shu, wo dou dule 2/3.

this CL list on DE any/which one-CL book, I dou read ASP 2/3

‘For every book on the list, I read 2/3 of it’.

-*wh/renhe...dou*, \*- collective partitive reading

b. Zhege danzishang de zhexie shu, wo dule 2/3.

this CL list on DE these book, I read ASP 2/3

‘I read 2/3 of the total number of books on the list.’

-definite NP<sup>OK</sup>- collective partitive reading

(79) *Wh/Renhe...dou* is not compatible with onceonly predicates, but a definite is.

a. \*renhe/na yige henta de ren dou zai gongyuan shasile ta  
any/which one-CL hate him DE person dou at park kill dead  
ASP him

‘Anyone who hates him killed him in the park.’

b. tamen zai gongyuan shasi le nage kuaidan

they at park kill dead ASP that-CL bad guy

‘They killed that bad guy in the park.’

Furthermore, as discussed earlier, *wh...dou* can take *lian* modification in which *dou* can alternate with *ye*. It is not clear how this analysis deals with *lian* modification and the *dou/ye* alternation if *dou* denotes iota. As seen below, the definiteness of *dou* in (80a) can’t be replaced by *ye* in (80b).

(80) a. Sangeren \*(dou) laile  
 three CL person dou come-ASP

‘All of the three persons came.’

b. \* Sangeren ye laile  
 three CL person also come-ASP

‘Three persons also came.’

To conclude, although I haven’t given an explicit semantics account of FC items, what I have presented shows that formalizing *dou* in terms of an iota operator may not be on the right track.

#### 4.6 Conclusion

This chapter studied two FC structures in Chinese, *renhe...dou* and *wh...dou*, by relating them to the discussions of English FC *any* and *whatever*. We first showed that *renhe...dou* aligns with universal *any* but not with definite *whatever*. We also showed that

*renhe...dou* is parallel to *mei...dou* in many aspects and suggested that it be treated on a par with *mei...dou*. In particular, we assumed that *dou* is distributive and the universality comes from *renhe*. Then we talked about *wh...dou*. We showed that it is not obviously characterized in terms of either *any* or *whatever*. And it is also different from *mei...dou*. We suggested that *wh...dou* is related to scalar *dou*. That is, it is the scalarity that is responsible for the universality of sentences with *wh...dou*. The benefit of this analysis is that the two *dou*'s as proposed in the previous chapters, distributive *dou* and scalar *dou*, are connected in the expressions of FC.

## CHAPTER 5

### CONCLUSION: DOU, CONTEXT SENSITIVITY, AND BARE NPS

#### 5.1 Introduction

This thesis has examined the semantics of *dou* by focusing on its interaction with various nominal phrases and the main conclusions have been drawn from a thorough study of *dou* in the context of quantifier NPs and focused NPs. I claimed that these contexts involve two different *dou*'s, distributive *dou* and scalar *dou*, which are linked by their shared context sensitivity and distinguishable by their stress behavior, as summarized in (1) below.

(1) *dou* with quantifier NPs and focused NPs

NPs	Semantics of <i>dou</i>		Stress pattern of <i>dou</i>
a. Quantifier NPs -mei-NP... <i>dou</i> 'every' -dabufen NP... <i>dou</i> 'most' *-yixie-NP... <i>dou</i> 'some'	Distributivity	Context-sensitivity	Stressed OK
b. NPs in focus -lian [NP] <sub>f</sub> <i>dou</i> 'even'	Scalarity		*Stressed

In this connection I also discussed differences between Chinese and English, as indicated

in (2). The difference in (2a) was taken to be a difference of quantifier NPs in the two languages, following Lin. Specifically, Chinese quantifier NPs denote plural individuals but English quantifiers are generally distributive. To deal with the difference in (2b), I claimed that although *lian* is like *even*, the dependence of *lian* on *dou* in Chinese is not a semantic requirement but a syntactic one. I followed Shyu assuming that this is because *lian* needs to check against *dou* its strong focus feature.

(2) Chinese *dou* and English *all*

NPs	Chinese <i>dou</i>	English <i>all</i>
a. Quantifier NPs	[ <i>mei/dabufen</i> NPs ...*( <i>dou</i> )] 'every/most... <i>dou</i> '	*[every/most NPs... <i>all</i> ]
b. Focused NPs	[ <i>lian</i> [NP] <sub>f</sub> *( <i>dou</i> )] 'even... <i>dou</i> '	*[even [NP] <sub>f</sub> <i>all</i> ]

This thesis also explored the behavior of *dou* in FC contexts. We approached this from the perspective of English FC *any* and *wh-ever*. We showed that *renhe...dou* behaves like universal *any* but *wh...dou* behaves neither like universal *any* nor like definite *wh-ever*. We suggested in the end that *renhe...dou* be characterized in terms of *mei...dou* as involving distributive *dou* and *wh...dou* be characterized in terms of *lian...dou* as involving scalar *dou*, as summarized in (3) below.

(3) *dou* with *renhe*-NPs and *wh*-NPs

FCIs	Semantics of <i>dou</i>		Stress pattern of <i>dou</i>
a. <i>renhe</i> -NP... <i>dou</i> ‘any’	distributivity	<i>mei</i> ... <i>dou</i> ‘every’	Stressed OK
b. <i>wh</i> -NP... <i>dou</i> ‘any’	scalarity	<i>lian</i> ... <i>dou</i> ‘even’	*Stressed

However, in this thesis, we haven’t touched upon the following issues. First, do the two structures in (3) involve context sensitivity, as highlighted in (4)?

(4) *dou* with *renhe*-NPs and *wh*-NPs

FCIs	Semantics of <i>dou</i>			Stress pattern of <i>dou</i>
a. <i>renhe</i> -NP... <i>dou</i> ‘any’	distributivity	<i>mei</i> ... <i>dou</i> ‘every’	Context-sensitivity	Stressed OK
b. <i>wh</i> -NP... <i>dou</i> ‘any’	Scalality	<i>lian</i> ... <i>dou</i> ‘even’	Context-sensitivity	*Stressed

Second, the analysis of *dou* as a distributive operator was originally developed on the basis of its behavior in the context of definite plurals, where *dou* shows different stress pattern than in focus structure. But what we haven’t discussed is whether context-sensitivity also applies to *dou* here, as shown in (5).

(5) *dou* with definite plurals

NPs	Semantics of <i>dou</i>		Stress pattern of <i>dou</i>
a. Definite plurals	Distributivity	Context-sensitivity	Stressed
b. NPs in focus -lian [NP] <sub>f</sub> <i>dou</i> ‘even’	Scalarity	Context-sensitivity	*Stressed

Third, we have shown how *dou* interacts with various nominal phrases in Chinese, but we did not see how *dou* interacts with bare NPs. Bare NPs are peculiar in displaying a variety of interpretations, as originally pointed out by Carlson 1977, thus it might be interesting to see how the various readings of bare NPs impact our analysis of *dou* and how our analysis of *dou* contributes to the understanding of bare NPs.

In this last chapter, I will provide some of my thoughts on these issues, hoping that these exploratory discussions will induce further research on them. This chapter is organized as follows. 5.2 talks about context sensitivity of *dou* in FC structures as well as in the context of definite plurals. 5.3 discusses bare NPs from the perspective of *dou*. 5.4 summarizes the chapter.

## 5.2 Context sensitivity of *dou* again

In this section, I will discuss briefly the issue of context sensitivity of *dou*. I will first look at it in the contexts of FC constructions and then in the context of definite plurals. We look at *renhe...dou* and *wh...dou* first.

As summarized above in (3), we took *renhe...dou* ‘any’ on a par with *mei...dou* ‘every’, claiming that *dou* in *renhe...dou* is also distributive. Below we show that the presupposition of *dou* about prior expectations on the part of the speaker also applies here if we assume *renhe* statements are evaluated against a set of domain alternatives.<sup>63</sup>

Recall that in chapter 2 we mentioned that the expectation presupposition of *dou* in the *many* statement is satisfied because the high expectation requirement of *many* matches well with that of *dou*. Specifically, as in (6), (6b) is true just in case the cardinality of the plural kids who drew a picture is equal to or above the speaker’s expectation. This in turn satisfies the felicity requirement of *dou* in (6c). Suppose in a context where 12 out of 20 kids meets the speaker’s expectation, then both *many* and *dou* require that the cardinality of the plurality is 12 or above.

- (6) a. Hendo *haixi dou hua le yifuhua*  
 many kid dou draw ASP one-CL picture  
 ‘Many kids drew a picture.’
- b.  $\exists Z \exists X [\text{KID}'(X) \ \& \ \forall Y (\text{KID}'(Y) \rightarrow Y \subseteq X) \ \& \ Z \subseteq X \ \& \ \forall y [y \in \parallel \text{Cov} \parallel \ \& \ y \subseteq Z \rightarrow \text{draw}'(y, \text{picture}') \ \& \ |Z| \geq n] ]$
- c. *dou*  $p \geq n$

This was seen to be extendable to the statements with *mei* ‘every’. We claimed that in examples such as (7), we evaluate the speaker’s expectation against the maximal set of

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<sup>63</sup> Many researchers have proposed that FCIs are evaluated against a set of alternatives due to their Domain Widening effects, but they differ as to what alternatives FCIs introduce. For example, Chierchia (2004, 2006) proposes that FCIs introduce domain alternatives and Giannakidou (2001) assumes that FCIs introduce epistemic alternatives.



individuals in a given context because *mei* statement involves the maximal number of the individuals in the extension of the NP *mei* is attached to. This means that in the above context with 20 kids, the *mei* statement is true in case each of the 20 kids drew a picture. Consequently, the *mei* statement (20 out of 20 kids drew a picture) entails the *many* statement (12 out of 20 drew a picture). Since *dou* is satisfied in the *many* statement, it should also be satisfied in the *mei* statement given the entailment relationship between the two. We assume that the same sort of entailment relationship also exists between a *renhe* statement and a *many* statement, thus whatever works for *mei* above should work for *renhe* as well. (8) shows the entailment relationship between *renhe* statements and corresponding statements with *henduo* ‘many’ and *dabufen* ‘most’. The former will entail the latter if we assume that *renhe* statements may be evaluated against a set of alternatives with different quantificational domains: *some*, *many*, *most* etc.

- (7) a. Meiyige haizi dou huale yifu hua  
 every kid dou draw-ASP one-CL picture  
 ‘Every kid drew a picture’  
 b.  $\exists X [\forall x (x \in X \leftrightarrow \text{kid}'(x)) \ \& \ \forall y [y \in \parallel \text{Cov} \parallel \ \& \ y \subseteq X \rightarrow \text{draw}'(y, \text{picture})]]$   
 c.  $\text{dou}^{p \geq n}$
- (8) a. The tai jiqi nen huida renhe wenti ==>  
 This-CL machine can answer any question  
 ‘This machine can answer any question(s).’  
 b. The tai jiqi neng huida henduo/dabufen wenti

This-CL machine can answer many/most question

‘This machine can answer many/most questions.’

Next we turn to *wh...dou*. We assumed that *wh...dou* involves scalar *dou*. And in chapter 3, we speculated that the expectation of scalar *dou* is a proposition that makes reference to the alternative set. Suppose we follow Chierchia (2004) assuming that a FCI is evaluated against a set of domain alternatives, the alternative set of (9), for example, may look like (10).

(9) (lian) shei dou keneng shenqing dao jiangxuejin. Even a C student like John.

even who dou may get scholarship

‘Anyone may get a scholarship. Even a C student like John.’

(10) a. {Someone in  $D_3$  may get a scholarship, Someone in  $D_2$  may get a scholarship, Someone in  $D_1$  may get a scholarship}

b.  $D_3$  include A students, B students and C students

$D_2$  include A students and B students

$D_1$  include A students

$D_3 \supset D_1$

In this case, the sentence asserts that someone in  $D_3$  may get a scholarship. And *lian* introduces the presupposition that the asserted proposition is less likely than the alternative propositions in which some student in a domain different from  $D_3$  could get a scholarship. That is, the statement that some student in  $D_3$  may get a scholarship is less

likely than the statement in which some student in  $D_1$  or  $D_2$  may get a scholarship. What we have claimed about *dou* is that it relates the asserted proposition to its alternative propositions in terms of the expectation of the speaker. This means that for (9), the speaker had expected that some student  $D_1$  or  $D_2$  may get the scholarship but that some student in  $D_3$  may get the scholarship exceeds the speaker's expectation. And (9) may happen when there are more scholarships than the applicants and every applicant is guaranteed a scholarship even if she or he will not normally get a scholarship. This being the case, *dou*'s presupposition is satisfied here.

Now we look at *dou* in the context of definite plurals to see how *dou*'s context sensitivity is satisfied there. As is known from earlier discussions *dou* in (11) is distributive. (11) means that each individual in the subject denotation drew a picture.

- (11) They      *dou*    hua le yifuhua  
          they      *dou*    draw ASP one-CL picture  
          ‘They each drew a picture.’

Suppose there are 10 kids in this context, then (11) is true in case each of the 10 kids drew a picture. In this context, each of the 10 kids drew a picture entails each of the 9 kids or each of the 8 kids drew a picture, as shown in (12). This being the case, it means that the speaker had expected (12b) or (12c) but not (12a). In other words, (12a) exceeds the speaker's expectation. As a result, *dou*'s high expectation presupposition is satisfied.

- (12) a. 10 ge haizi    *dou*    hua le      yifuhua    ==>  
          10 CL kid    *dou*    draw ASP one-CL picture

‘Each of the 10 kids drew a picture.’

b. 9 ge haizi dou hua le yifuhua

‘Each of the 9 kids drew a picture.’

c. 8 ge haizi dou hua le yifuhua

‘Each of the 8 kids drew a picture.’

To sum up, FC constructions and definite plurals satisfy *dou*’s presupposition about expectations. Below we discuss *dou* in the contexts of bare NPs.

### 5.3 *dou* and bare NPs

In this last section, I would like to take a look at the behavior of bare NPs from the perspective of *dou*.<sup>64</sup> I will start from Yang’s (2001) generalizations about Chinese bare NPs, which she draws by taking Chinese bare NPs on a par with English bare plurals. Then I extend the discussion by placing Chinese bare NPs against a complete paradigm of Chinese definite NPs and indefinite NPs on the one hand and by placing the various NPs in the contexts of *dou* on the other. This exploration reveals many interesting facts about bare NPs and *dou*, but in the following discussion, I will focus on two issues. One is whether Chinese bare NPs are aligned with definite NPs as Yang claims. Another is how bare NPs interact with *dou* in various contexts. The facts presented below show that Chinese bare NPs are not straightforwardly correlated with definite NPs. But the interactions between various NPs and *dou* help us understand better the characteristics of

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<sup>64</sup> I am grateful to Viviane Deprez (p.c) for bringing up the issue of bare NPs.

two *dou*'s. Before exploring how *dou* interacts with bare NPs in Chinese, below I introduce briefly Yang's study of Chinese bare NPs.

Yang approaches Chinese bare NPs in comparison with English bare plurals drawing on Carlson (1977) and various developments of the ideas presented there. She proposes to analyze Chinese bare NPs as kind terms in defense of Neocarlsonian approach (Carlson 1977, 1989, Chierchia 1982b, 1998, etc.) over the ambiguity approach (Krifka 1988, Wilkinson 1991, Diesing 1992, Kratzer 1995) based on striking similarities between Chinese bare NPs and English bare plurals in interpretations and scope behaviors, as illustrated below.<sup>65</sup>

First, Chinese bare NPs display similar quantificational variability as English bare plurals. For example, as in (13), English bare plurals have species-like interpretations with kind-level predicates, generic interpretations with individual-level predicates and existential readings in episodic contexts.

- |      |    |                            |          |
|------|----|----------------------------|----------|
| (13) | a. | Dogs are extinct.          | -kind    |
|      | b. | Dogs are very intelligent. | -generic |

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<sup>65</sup> The Neocarlsonian approach takes the kind-level reference to be the only denotation for bare arguments and derives the non-kind-level interpretations in object level contexts via type shifting operations. The ambiguity approach, on the other hand, treats bare plurals as ambiguous between kind-terms in kind-level contexts and properties in object-level contexts. That is, the non-kind-level interpretations in (i) are treated in parallel to singular indefinites in (ii) in the same contexts.

- |      |    |                                 |             |
|------|----|---------------------------------|-------------|
| (i)  | a. | Dogs are intelligent.           | -generic    |
|      | b. | I saw dogs.                     | -indefinite |
| (ii) | a. | A dog is (usually) intelligent. | -generic    |
|      | b. | I saw a dog (yesterday).        | -indefinite |



narrow scope in relation to another operator and it has only an opaque reading. But the regular indefinite *a doctor* can have higher scope and yields a transparent reading.

- (15) a. John is looking for doctors. -opaque reading only  
 b. John is looking for a doctor  
 (i) John is looking for any doctor. -opaque reading  
 (ii) John is looking for a (specific) doctor. -transparent reading

Yang points out that the corresponding Chinese sentence with bare NPs behaves differently from either English bare plurals or English indefinites. As indicated in (16), Chinese displays not only an opaque reading as English bare nominals and indefinites do, it also has a definite reading <sup>67</sup>. Yang assumes that this definite reading is different from a transparent reading of a specific indefinite. This is because bare nominals lack the kind of intermediate reading specific indefinites have in contexts such as (17).

- (16) Yuehan zai-zhao yisheng  
 John be- looking for doctor  
 (i) John is looking for doctors. -opaque reading  
 (ii) John is looking for the doctors. - definite reading
- (17) a. Dabufen yulanxuejia dou kanguo mei-ge [jiejue wenti -de]  
 fenxifangfa  
 most linguist dou look -ASP every-CL solve problem -DE  
 analysis

---

<sup>67</sup> I will show below that bare NPs have only an opaque reading under the scope of *dou*.

‘Most linguists have looked at every analysis that solves *the problem*’

- b. Dabufen yulanxuejia dou kanguo mei-ge [jiejue *mouge wenti* -de]  
 fenxifangfa  
 most linguist dou look -ASP every-CL solve certain problem  
 -DE analysis

‘Most linguists have looked at every analysis that solves *a certain problem*’

In (17a), bare NP *wenti* ‘problem’ takes maximal scope and it is meant to be a unique problem for which all possible solutions have been reviewed by most linguists. But the indefinite *mouge wenti* ‘a certain problem’ in (17b) doesn’t have to take maximal scope. It can have the intermediate reading in which for most linguists, there is a problem such that he has looked at every analysis that solves that problem.

Based on the above, Yang concludes that Chinese bare NPs need to be distinguished from specific indefinites and they are best analyzed as kind-terms.

Against the basic generalizations about Chinese bare NPs drawn from the perspective of English bare plurals, below I would like explore the issue further from the perspective of Chinese NPs and *dou*. To this end, I will provide a complete paradigm of Chinese NPs-- bare NPs, indefinite NPs and definite NPs -- as they are in the contexts introduced above. That is, we will see the above types of NPs in kind contexts, individual contexts and episodic contexts respectively. In addition, we will show how these NPs are compatible with two different *dou*’s in each context. Below I look at NPs in kind contexts first. The table in (18) summarizes my study of the interpretations of various NPs with



kind level predicates and their interactions with *dou*.

(18) Kind-level predicates

NPs	Examples	kind level predicates like <i>extinct</i>	$Dou^{dist}$	$Dou^{scalar}$
Bare NPs	<i>gou</i> 'the dog kind'	-kind	√	√
Indefinite NPs	<i>yizhong gou</i> 'one-CL <sup>kind</sup> dog' 'a kind of dog'	-indefinite kind	*	*
	<i>yizhi gou</i> 'one-CL <sup>singular</sup> dog' 'a dog'	*	*	*
	<i>yixiegou</i> 'one-CL <sup>plural</sup> dog' 'some dogs'	*	*	*
Definite NPs	<i>zhezhonggou</i> 'this-CL <sup>kind</sup> dog' 'this kind of dog'	-definite kind	*	√
	<i>zhezhi gou</i> 'this-CL <sup>singular</sup> dog' 'this dog'	*	*	*
	<i>zhexiegou</i> 'this-CL <sup>plural</sup> dog' 'these dogs'	*	*	*

One thing that is worth keeping in mind is that there are three kinds of classifiers in Chinese that can be added to *gou* 'dog' to form an indefinite or a definite. One is *zhong* 'kind', glossed as CL<sup>kind</sup>, denoting 'a kind of dog' or 'this kind of dog'. Another is *zhi*, glossed as CL<sup>singular</sup>, denoting 'a dog' or 'the dog'. The third is *xie* 'some', glossed as CL<sup>plural</sup>, denoting a plurality. For example, 'yi/zhe-CL<sup>pl</sup>-gou' means 'some dogs/ these dogs'.

(18) shows that in kind-level contexts, both indefinite NPs and definite NPs may have the kind-like interpretations when they are composed of the classifier *zhong* ‘kind’, just like bare NPs. But unlike bare NPs, they have a slightly different reading. As illustrated in (19), an indefinite NP in (a) means the extinction of a certain kind of dog, which could be continued with (c): ‘but I don’t remember which one’. In contrast, a definite NP in (b) means the extinction of a definite kind of dog, which could not be continued with (c).<sup>68</sup> I call the reading in (a) *indefinite kind* and the reading in (b) *definite kind*. This is different from a bare NP in this context. As introduced earlier, a bare NP in this context means *the dog kind*. That is, it is not about a particular kind of dog, it is about the dog-species or *all kinds of dogs*.

- (19) a. You yizhong gou            juezhong le.  
           exist one-CL<sup>kind</sup> dog    extinct ASP,  
           ‘One kind of dog is extinct.’
- b. Zheizhong gou    juezhong le.  
           this-CL<sup>kind</sup>    dog    extinct ASP  
           ‘This kind of dog is extinct.’
- c. Keshi    wo wangle            shi nayizhong  
           but    I    forget -ASP    be which one-CL<sup>kind</sup>  
           ‘But I don’t remember which one’

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<sup>68</sup> Veneeta Dayal provides me the test in (19c) to distinguish the two kinds of readings.

(18) also shows that only a bare NP may license distributive *dou* in this context but an indefinite or a definite NP may not. That a bare NP can go with *dou* is illustrated below. In (20), the speaker A means to say that a particular kind of dog is extinct but the speaker B replies with a bare NP emphasizing that all (kinds of) dogs are extinct. In contrast, a definite or an indefinite NP talks about *one kind of dog*, thus when *dou* is applied, it would lead to an impossible reading in which every dog of a particular kind is extinct.

- (20) A. Zhezhong gou jue zhong le  
 This-CL<sup>kind</sup> dog extinct ASP  
 ‘This kind of dog is extinct.’
- B. Gou dou yijing jue zhong le  
 dog dou already extinct ASP  
 ‘All dogs are already extinct.’

Third, a bare NP is compatible with both *dou*'s, which indicates that a bare NP may be ambiguous between kind reading and scalar reading. This is different from either an indefinite or a definite. The former goes with neither *dou* and the latter goes only with scalar *dou*.

To sum up, bare NPs are similar to CL<sup>kind</sup>-formed indefinites and definites in having the kind-like interpretations. But they differ from the latter in the ability to host distributive *dou* and in displaying ambiguity with kind-level predicates. This not only separates bare NPs from indefinite or definite NPs, it also helps to separate the two *dou*'s.

Next, let us look at the paradigms in individual-level contexts, as summarized in

(21) below.

(21) Individual-level predicates

		Individual level predicates like <i>intelligent</i>	<i>Dou</i> <sup>dist</sup>	<i>dou</i> <sup>scalar</sup>
Bare NPs	<i>Gou</i>	-generic	√; generic	*
Indefinite NPs	<i>yizhonggou</i> 'one-CL <sup>kind</sup> dog' 'a kind of dog'	-indefinite	√; indefinite	*
	<i>yizhigou</i> 'one-CL <sup>singular</sup> dog' 'a dog'	-indefinite	*	*
	<i>yixiegou</i> 'one-CL <sup>plural</sup> dog' 'some dogs'	-indefinite	*	*
Definite NPs	<i>zhezhi</i> 'this-CL <sup>singular</sup> dog' 'this dog'	-definite	*	√
	<i>zhezhonggou</i> 'this-CL <sup>kind</sup> dog' 'this kind of dog'	-generic	√;generic	√
	<i>zhexiegou</i> 'this-CL <sup>plural</sup> dog' 'these dogs'	-definite	√;definite	√

This table reveals several interesting properties of NPs and *dou*. First, unlike in kind predicates where NPs are acceptable only when they are composed of the kind-denoting classifier, in this context, *all* NPs are acceptable. In addition, they manifest different interpretations. What is of special interest here is that, definites formed by the classifier *zhong* 'kind' may have generic readings, in contrast to indefinites in this context that may not. This is illustrated below. (22a) contains a definite NP, (22b) a bare NP and

(22c) an indefinite NP:

- (22) a. Zhezhong gou            hen congming.  
           this CL<sup>kind</sup> dog            very smart  
           ‘This kind of dog is intelligent’            -generic
- b. Gou            hen congming.  
           dog            very smart  
           ‘Dogs are intelligent’            -generic
- c. You yizhong gou            hen congming  
           exist one CL<sup>kind</sup> dog            very smart  
           ‘There is one kind of dog that is intelligent’            -indefinite

This shows that a bare NP is closer to a definite NP rather than an indefinite NP. In addition, the lack of generic readings of Chinese indefinites in this context suggests that Chinese indefinites are different from English ‘a N’ that has a generic reading.<sup>69</sup>

- (23) A dog is (usually) intelligent.            -generic

Second, despite the fact that bare NPs pattern with definite NPs in terms of the availability of generic interpretations, this is not the case when we look at the interaction of NPs with scalar *dou*. As indicated in (21), in this context, bare NPs are like indefinite NPs in that neither of them is able to host scalar *dou*.

Third, the possible combinations of NPs with distributive *dou* is also very

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<sup>69</sup> Veneeta Dayal pointed out to me that Chinese indefinites are like English ‘some N’ in this respect.

revealing. As indicated in (21), NPs combining with *dou* not only yield a generic reading and a definite reading, they also yield an indefinite reading. This is exemplified below.

(24a) contains a bare/ definite NP and (24b) contains an indefinite NP.

- (24) a. Gou /Zhexie            dou    hen congming  
           dog / this CL<sup>pl</sup> dog    dou    very smart  
           ‘All dogs/All of these dogs are intelligent’            -generic/definite
- b. You yizhong gou        dou    hen congming  
           exist one CL<sup>kind</sup> dog    dou    very smart  
           ‘There is a kind of dog, all of which are intelligent’        -indefinite

The example in (24b) is revealing in two ways. One, *dou* doesn’t seem to play the definite function as has normally been assumed in the literature, which we have acknowledged in chapter 4. Two, *dou* may be licensed by all kinds of NPs: bare, definite, or indefinite, providing another piece of evidence against the view that the distribution of *dou* is restricted to some particular kinds of NPs, as we discussed in chapter 2.

Related to this, there is another interesting fact with regard to bare NPs. While bare NPs show compatibility with distributive *dou* and incompatibility with scalar *dou* in the contexts like *intelligent*, this is not the case when we look at bare NPs in the contexts of other individual-level predicates. This is indicated in the following table in (25).<sup>70</sup>

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<sup>70</sup> Thanks to Veneeta Dayal for pointing out this potential correlation here (p.c).

(25) Bare NPs and *dou* in individual-level contexts

English sentences	Chinese sentences	<i>Dou</i> <sup>dist</sup>	<i>dou</i> <sup>scalar</sup>
1. Dogs are intelligent	Gou hen congming Dog very smart	√	*
2. Dogs are mammals	Gou shi burudongwu Dog be mammal	√	*
3. Birds can talk	Niao hui shuohua Bird can talk	*	√
4. Dogs are common (in this area).	(zhegedifang) gou hen pubian this area dog very common	*	√

The first column on the left are English sentences and the column next to it are Chinese equivalents with bare NPs. This table shows that distributive *dou* goes with bare NPs in examples such as 1 and 2 with predicates *intelligent* or *mammals* but not in examples such as 3 and 4 with predicates *can talk* or *common*. But scalar *dou* shows the reverse: it is not acceptable in examples 1 and 2 but is good in examples 3 and 4.

The difference in the above sentences lies in variability of quantificational force of bare NPs.<sup>71</sup> As shown in (26), bare NPs in examples 1 and 2 have a quantificational force of *most* and *all* respectively. The bare NP in example 3 has a quantificational force of *some* because only some kinds of birds can sing. The bare NP in example 4 doesn't involve any quantificational force. It is about the dog kind as a whole.

<sup>71</sup> Chinese bare NPs are identical to English bare plurals in showing variability of quantificational force.

(26) Quantificational variability of bare NPs and *dou*

English sentences	Chinese sentences	Quantificational force	<i>Dou</i> <sup>dist</sup>	<i>dou</i> <sup>scalar</sup>
1. Dogs are intelligent	Gou hen congming dog very smart	'most dogs'	√	*
2. Dogs are mammals	Gou shi burudongwu dog be mammal	'all dogs'	√	*
3. Birds can talk	Niao hui shuohua bird can talk	'some birds'	*	√
4. Dogs are common (in this area).	(zhegedifang) gou hen pubian this area dog very common	-N/A	*	√

Seen in this way, bare NPs in individual-level contexts show exactly the *dou*-(dis)harmony effect of quantifier NPs as we discussed in chapter 2. This is yet another corroboration of our view that *dou* is only compatible with quantifiers that support its presupposition of high expectation. In addition, the complimentary distribution of the two *dou*'s supports our view that there are two *dou*'s. Further, bare NPs may license both *dou*'s, suggesting that we need to correct our generalization about bare NPs in (21) into the following:

## (27) Individual-level predicates

NPs	Examples	Individual level predicates like <i>intelligent/can talk</i>	<i>Dou</i> <sup>dist</sup>	<i>dou</i> <sup>scalar</sup>
Bare NPs	<i>Gou/niao</i>	-generic	√	√



Finally, (28) summarizes the paradigms in episodic contexts.

(28) Episodic contexts

		Episodic contexts like <i>be barking/be catching mice</i>	<i>Dou</i> <sup>dist</sup>	<i>dou</i> <sup>scalar</sup>
Bare NPs	<i>Gou</i> ‘dog’	-definite/indefinite	√	√
Indefinite NPs	<i>yizhonggou</i> ‘one-CL <sup>kind</sup> dog’ ‘a kind of dog’	-indefinite	*	*
	<i>yizhigou</i> ‘one-CL <sup>singular</sup> dog’ ‘a dog’	-indefinite	*	*
	<i>yixiegou</i> ‘one-CL <sup>plural</sup> dog’ ‘some dogs’	-indefinite	*	*
Definite NPs	<i>zhezhi</i> ‘this-CL <sup>singular</sup> dog’ ‘this dog’	-definite	*	√
	<i>zhezhonggou</i> ‘this-CL <sup>kind</sup> dog’ ‘this kind of dog’	-definite	√	√
	<i>zhexiegou</i> ‘this-CL <sup>plural</sup> dog’ ‘these dogs’	-definite	√	√

As in (28), bare NPs are different from the other two types of NPs in interpretations. Bare NPs may have either definite readings or indefinite readings, but definite NPs or indefinite NPs can have only definite readings or indefinite readings respectively. The interpretational difference between bare NPs and the other two types of NPs is also seen in the *look-for* type of contexts. We mentioned earlier that a bare NP may have an opaque

and a definite reading in this context. However, when we put the bare NP under the scope of *dou*, it has only an opaque reading. That is, it can only take narrow scope with respect to *dou*, as shown in (29a). This contrasts with the other two types of NPs in (29b) where an indefinite *yige yisheng* ‘one doctor’ or a definite *nageyisheng* ‘that doctor’ may take wide scope over *dou*.

- (29) a. Tamen dou zai zhao yisheng -narrow scope only  
 they dou be look-for doctor  
 ‘They are looking for doctors’
- b. Tamen dou zai zhao yige /nage yisheng -wide scope possible  
 they dou be look-for one-CL/ that-CL doctor  
 ‘They are looking for a doctor/that doctor’

In conclusion, Chinese bare NPs are not straightforwardly like definite NPs or indefinite NPs in both interpretations and distributions. First, as summarized in (30), bare NPs display quantificational variability in the three contexts we examined, the other two types of NPs don’t. In addition, bare NPs also show different scope behaviors from the other two types of NPs with respect to *dou*.

(30)

	Episodic contexts	Individual contexts	Kind contexts	Scope w/ <i>dou</i>
Bare NPs	definite indefinite	generic	kind	narrow scope
Indefinite NPs	indefinite	indefinite	indefinite kind	wide scope

Definite NPs	definite	generic, definite	definite kind	wide scope
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Second, the message becomes mixed when we consider the distribution of NPs in the contexts of two *dou*'s. As the following summary shows, in episodic contexts and individual level contexts, bare NPs are like definite NPs in being able to host both *dou*'s. But in kind-level contexts, bare NPs pattern with neither of them. However, bare NPs are clearly aligned with definite NPs in two aspects. One is their generic reading in individual-level contexts, as in (30). The other is their ability to host scalar *dou*, as in (31).

(31)

	Episodic	Individual contexts	Kind contexts
Bare NPs	$dou^{dist}$ , $dou^{scalar}$	$dou^{dist}$ , $dou^{scalar}$	$dou^{dist}$ , $dou^{scalar}$
Indefinite NPs	* $dou^{dist}$ , * $dou^{scalar}$	$dou^{dist}$ , * $dou^{scalar}$	* $dou^{dist}$ , * $dou^{scalar}$
Definite NPs	$dou^{dist}$ , $dou^{scalar}$	$dou^{dist}$ , $dou^{scalar}$	* $dou^{dist}$ , $dou^{scalar}$

In addition to the above characteristics, bare NPs also show interesting interactions with *dou* in individual-level contexts. On the one hand, they are *dou*-compatible when they have quantificational force of *most* or *all* but *dou*-incompatible when they have quantificational force of *some*, in parallel to *dou* in the contexts of quantifier phrases. On the other hand, the *dou*-compatibility is reversed when

bare NPs are checked against scalar *dou*. I take this to be evidence to support our claim that the two *dou*'s need to be separated.

#### **5.4 Summary**

This chapter presented the findings of the previous chapters and discussed some residual issues relevant to those findings. I first discussed the availability of the claimed presupposition of *dou* in FC contexts and in the context of definite plurals. Then I provided some initial investigation into bare NPs from the perspective of *dou*. I identified the characteristics of bare NPs in comparison with definite and indefinite NPs in the contexts of *dou*. The conclusion I have reached is that bare NPs are not directly correlated with definite NPs or indefinites NPs. Meanwhile, the interactions between NPs and *dou* provide further support for our claim about two *dou*'s. I hope to have provided evidence that the central claim of this thesis, namely that there are two *dou*'s, is manifested in more areas of Chinese grammar than the chapters in this dissertation have focused on. Further studies of the roles of the two *dou*'s in these areas will be taken up in future studies.

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## Curriculum Vitae

Liping Chen

### EDUCATION

- 2008 Rutgers University, PhD in Linguistics
- 1994 MA in linguistics, Tianjin Normal University
- 1988 BA in English language and literature, Tianjin Normal University

### WORKING

- 2007-2008 Chinese language coordinator, University of Pittsburgh  
Department of East Asian Languages and Literatures
- 2005-2007 Visiting Lecturer, Carnegie Mellon University  
Modern Languages Department
- 1994-2000 Lecturer, Nankai University, Tianjin, PRC  
Department of Foreign languages and literatures
- 1988-1991 English instructor, Baiyang Vocational School, Tianjin, PRC

### PUBLICATIONS

1. Chen, Liping (2008). "The scalarity of *dou* in Chinese." To appear in *Proceedings of North American Conference on Chinese Linguistics 20*.
2. Chen, Liping (2005). "Dou-(dis)harmony in Chinese." in *Proceedings of North East Linguistic Society 35*
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