The Scalarity of Dou in Focus Structure

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This paper studies the semantics of scalar dou ‘roughly all’ in what is called lian...dou/ye ‘even...all/also’ construction in Mandarin Chinese. The dominant view in the literature is to assume that the scalar meaning is structural and scalar dou is treated on a par with distributive dou in the context of plural definites (e.g. Shyu 1995, Wu 1999, Portner 2002). In this paper, I address some rarely discussed issues such as the dou/ye alternation and the optionality of lian. I conclude that the scalarity comes from both lian and dou and I propose a way to capture their scalarity. In addition, a compositional semantics to lian...dou/ye is provided based on the semantics of each piece. Finally, some implications of the analysis are discussed.

0. Introduction

We know that dou as a distributive operator goes with a plural NP but not with a singular NP, as in the examples below.

1 This is a part of chapter 3 of my dissertation (Chen, 2008). For more detailed discussions of the issue, I refer readers to the dissertation.

2 But plurality is neither sufficient nor necessary to license dou. For example, 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 not acceptable because you 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.’
CHEN: THE SCALARITY OF DOU

(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*. 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 ]f dou hua le yifuhua.
   John dou draw –ASP one-CL picture
   ‘Even John drew a picture.’

   The above 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) is assumed to be (4). And a well-known feature about this structure is that *dou* may be replaced by *ye* ‘also’ without changing the meaning of the sentence. This is shown in (5).

(4) (Lian ) [John ]f dou hua le yifuhua.
    even John dou draw –ASP one-CL picture
    ‘Even John drew a picture.’

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

   However, when *lian* is overtly present, *dou* or *ye* has to be present, as shown in (6). This is in parallel to *mei*-NP and quantificational *dou*, as illustrated in (7). 3

    even John dou / also draw –ASP one-CL picture
    ‘Even John drew a picture.’

3 See Lin (1998) and Yang (2001) for analyses of *dou* with *mei*-NP.
(7) Meige haizi * (dou) huale yifuhua
    Every-CL kid dou draw-ASP one-CL picture
    ‘Every kid drew a picture.’

Below I will address the following issues: What is the contribution of the various particles? Or what is the source of the scalar reading? And how can we capture the scalarity observed in sentences with focus and dou?

1. The sources of the scalar reading

We show below that the scalarity 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.4

1.1. The scalar reading of dou

The scalar reading of dou is seen clearly in the examples below, where lian is absent. In (8) and (9), the object problem 2 is preposed before dou and ye in order to be focused.5

(8) John [di’er ti]f dou zuochulai le.
    John 2nd problem dou figure out ASP
    ‘John solved even problem 2.’

(9) John [di’er ti]f ye zuochulai le.
    John 2nd problem also figure out ASP
    ‘John solved also problem 2.’

(8) 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 (9) with ye minus lian has the also meaning without implicating whether the problem is difficult or not. Suppose the alternative problems to problem 2 are problem 1, 3, and 5, then (9) holds as long as John also solved problem 1 or problem 3 or problem 5, but this is not the case for (8). For (8) to be felicitous, problem 2 has to be a difficult problem with respect to the

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4 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).

5 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.
alternatives to it. In other words, *dou* in (8) invokes a ranking between the NP in focus and its alternatives but *ye* in (9) 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 (10), (8) becomes inappropriate as an answer. But (9) 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.

(10) A: John solved problem 5, which was the most difficult problem. Did he solve problem 2?
    B: (8) BAD/ (9) OK

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 (11) leads to the infelicity of the sentence.

(11) A: Is Claire an [assistant] professor?
    B: Assistant professor? She is even/ *also an [associate] professor!

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.

(12) A: Is Claire an [assistant] professor?

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 (10) and (12) above. In (10), 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 (12), when the existential interpretation conflicts with our world knowledge, the *ye* statement becomes odd but the *dou* statement is good.
1.2 The scalar reading of lian

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 against this claim.

First, the dou/ye difference with respect to scalarity in (10) disappears with the addition of lian. In particular, while the ye statement in B’s answer in (10) 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 (13), 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 (10), as shown in (14).

(13) John lian [di’er ti] ye zuochulai le.  
    ‘John solved even problem 2.’

(14) A: John solved problem 5, which was most difficult. Did he solve problem 2? 
    B: *(13)

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. The contribution of lian to scalarity is also seen in (15), where the dou/ye difference with respect to existentiality still exists when lian is added to them.

(15) A: Is Claire an [assistant] professor? 
    B: Zhuli jiaoshou? ta lian [fu] jiaoshou OK dou/* ye shi le. 
    assistant professor? she even associate professor dou/also be ASP

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. This contrast with lian...dou that seems to have only the scalar 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. The difference between lian...dou and lian...ye suggests that lian, like even, has only the scalar presupposition but not the existential one.  

To reiterate, lian is the source of scalarity and it doesn’t involve the existential presupposition. In addition, lian...dou is not identical to lian...ye. The former has only

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6 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.

7 That lian is like even is indirectly supported by lihn ‘include’ in Cantonese. As discussed in Shank (2004), Cantonese dou, as in (i), can mean either ‘also’ or ‘even’. But the two readings can be disambiguated by using lihn before the focused item, as in (ii), where lihn forces the scalar
scalarity, but the latter has both scalarity and existentiality. Below I provide one more evidence for the claimed difference between lian...dou and lian...ye.  

In (16), both dou and ye are good with a scalar reading. But in a situation where there are only two problems under consideration, the difference between dou and ye shows up. As in (17), the lian...dou statement is ok with the continuation that John didn’t solve the other problem but the lian…ye statement is no longer acceptable.

(16)        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’

(17)        John  lian [di’er ti]    dou / * ye zuo chulaile,      lian...dou/ *lian...ye  
John  lian problem 2  dou /also  figure out ASP.      buguo  ta  mei zuochulai  lingyidaod.  
but he  not work out  another one-CL      ‘John solved even problem 2, but he didn’t solve the other problem.’

(17) 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

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**even reading.**

(i)        Ngoh  a-John  dou  jin-jo  
I  par-John  also  see-pfv  
(a)  I even saw John  
(b)  I saw John too.

(ii)       Ngoh  lihn  [ a-John ],  dou  jin-jo  
I  include  par-John  also  see-pfv  
(a)  I even saw John  
(b)  *I saw John too.

This shows that Mandarin is different from Cantonese in that Cantonese dou is ambiguous between the existential and the scalar reading, Mandarin dou is not. The latter 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. 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.

However, it is not clear to me whether existentiality stays in lihn...dou in Cantonese.  

From what I know about Mandarin dou, 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.

8 This potential difference between lian...dou and lian...ye here is brought to my attention by Veneeta Dayal.
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.

To sum up, the scalar reading in lian...dou/ye might come from either dou or lian and the scalarity of the latter is inherent to its meaning much as scalarity is inherent to the meaning of even. But where does the scalarity of dou come from? We turn to this topic next.

1.3. The source of the scalarity of dou

In this section, I discuss the scalarity of dou, suggesting that it arises from its presupposition of high expectation following Chen’s (2005) analysis of dou for quantified statements.

In Chen (2005), to account for the dou (dis)harmony effect such as that in (18), she proposes 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. In this view, the (dis)harmony in (18) follows from the match or mismatch between the presupposition of dou and the semantics of the quantifier concerned. This is shown in (19) and (20), where dou \( p \geq n \) stands for the presupposition of dou.\(^9\)

\[(18)\]  
\[\text{many NP...dou/} \ast\text{few NP...dou} \]
\[\text{Henduode/} \ast\text{Henshaode haizi dou huale hua} \]
\[\text{many/few kid dou draw-ASP picture} \]
\[\text{‘Many/Few kids drew a picture.’} \]

\[(19)\]
\[
\begin{align*}
\text{IP: } & \exists Z \exists X \left[ \text{KID}'(X) \& \forall Y \left( \text{KID}'(Y) \rightarrow Y \subseteq X \& Z \subseteq X \right) \right. \\
& \quad \& \forall y \left[ y \in \ll \text{Cov} \ll \& y \subseteq Z \rightarrow \text{draw}'(y, \text{picture'}) \right] & [ \left| Z \right| \geq n ] \\
\text{DP: } & \lambda Q \exists Z \exists X \left[ \text{KID}'(X) \& \forall Y \left( \text{KID}'(Y) \rightarrow Y \subseteq X \right) \& Z \subseteq X \& Q(Z) \right] \\
\text{VP: } & \lambda X \forall y \left[ y \in \ll \text{Cov} \ll \& y \subseteq X \right. \\
& \quad \rightarrow \text{draw}'(y, \text{picture'}) \\
\text{VP: } & \lambda x \text{draw}'(x, \text{picture'}) \\
\text{many kids} & \quad \text{drew a picture} \\
\lambda P \lambda X \forall y \left[ y \in \ll \text{Cov} \ll \& y \subseteq X \rightarrow \text{P}(y) \right]
\end{align*}
\]

\(^9\) 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 \( n \).
In (19), 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, the sentence 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 (20), 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 the presupposition of dou is not satisfied.

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, (21) implies that John’s solving problem 2 is not expected. Concretely, if there are two alternative problems, problem 3 and 4 in this context, (21) 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 (22), 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. In other words, (21) entails that the speaker had expected that John might solve problem 3 or 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.

(21) John (lian) [di’er ti]f dou zuochulai le. John even 2nd problem dou figure out ASP ‘John solved even problem 2.’

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

Having identified the functions of *dou, ye* and *lian*, our goal next is to provide a compositional semantics for them. 2.1 briefly introduces focus semantics and the semantics for *even* on which we build our analysis. 2.2 shows how the particles are combined. 2.3 is a summary.

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10 The alternative semantics of focus will be introduced in the next section.
11 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]f dou mei zuochulai le. John 2nd 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.


(iii) * You 10 ge xuesheng mei dou xuan zhemenke *[ 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.’

12 Like it is in the positive sentence, *ye* in this context doesn’t have the scalar reading either:

(i) John [di’er ti]f ye mei zuochulai le. John 2nd problem also not figure out ASP ‘John didn’t solve problem 2, either.’
2. Combining focus sensitive particles

2.1. Background on focus semantics

In the alternative semantics of Rooth (1985, 1992), focus expresses a semantic value $\langle \alpha \rangle^f$ in addition to its ordinary semantic value $\langle \alpha \rangle^0$. 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 (23) 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.

\begin{align*}
(23) & \quad a. [\text{Mary}]_f \text{ likes Sue.} \\
& \quad b. \text{Mary likes [Sue]}_f
\end{align*}

The focus semantic value for (23a) is the set of propositions of the form ‘x likes Sue’, while the focus semantic value for (23b) 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:

\begin{align*}
(24) & \quad a. \langle [\text{Mary}]_f \text{ likes Sue} \rangle^f = \{\text{Mary likes Sue, Linda likes Sue, Lisa likes Sue}\} \\
& \quad b. \langle \text{Mary likes [Sue]}_f \rangle^f = \{\text{Mary likes Sue, Mary likes Linda, Mary likes Lisa}\}
\end{align*}

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 (25), the truth conditional content or the assertion is (26). 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 (25a) is to relate the assertion to the set of propositions in (24a) and that of even in (25b) is to relate the assertion to the set of propositions in (24b).

\begin{align*}
(25) & \quad a. \text{Even [Mary]}_f \text{ likes Sue.} \\
& \quad b. \text{Mary likes even [Sue]}_f \\
(26) & \quad \text{Mary likes Sue.}
\end{align*}

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. Following the notation of Rooth (1985), this is done in (27), where even quantifies over propositions that are restricted by the context variable C:
The existential implicature in (27a) says that there is some proposition \( p \) that is restricted by \( C \), which is true, and it is distinct from the assertion, \( \wedge\ a \). The scalar implicature in (27b) says that for all true propositions of the form \( p \) that are restricted by \( C \) and they are distinct from the assertion, \( \wedge\ a \), the likelihood of \( p \) exceeds that of \( \wedge\ a \).

Under this view, the presuppositions of \( \text{even} \) in (25a), for example, are as follows:

(28)  

(a) Existential presupposition:  
\[ \exists p \left[ \exists x \left[ p = \wedge\ \text{like'} (x, \text{Sue}) \& p \neq \wedge\ \text{like'} (\text{Mary}, \text{Sue}) \right] \right] \]

(b) Scalar presupposition:  
\[ \forall p \left[ \exists x \left[ [p = \wedge\ \text{like'} (x, \text{Sue}) \& p \neq \wedge\ \text{like'} (\text{Mary}, \text{Sue})] \rightarrow \text{likelihood'} (p) > \text{likelihood} (\text{like'} (\text{Mary}, \text{Sue})) \right] \right] \]

In (28), (a) says that a proposition of the form \( x \text{ likes Sue} \) is true and it is not identical to the assertion \( \text{Mary likes Sue} \). (b) says that for all true alternative propositions in the form of \( x \text{ likes Sue} \), which are distinct from the assertion, they are more likely than the assertion \( \text{Mary likes Sue} \). This amounts to saying that \( \text{Mary likes Sue} \) is the least likely among all the alternative propositions.

Having introduced focus semantics and the semantics of \( \text{even} \), below we show how the particles in Chinese are combined following this approach.

2.2. Combining the particles

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

(29)  

(a) The scalar presupposition \( \text{lian} \)  
\[ \forall q \left[ [C (q) \& q \neq \wedge\ p] \rightarrow q >_{\text{likely}} \wedge\ p \right] \]

(b) The existential presupposition \( \text{ye} \)  
\[ \exists q \left[ C (q) \& q \neq \wedge\ p \right] \]

(c) The scalar presupposition \( \text{dou} \)  
\[ \forall q \left[ [C (q) \& q \neq \wedge\ p] \rightarrow \wedge\ p >_{\text{speaker-expectation}} q \right] \]

The presuppositions of \( \text{lian} \) and \( \text{ye} \) in (a) and (b) are identical to the scalar presupposition and the existential presupposition of \( \text{even} \) respectively. The former 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 \( \text{dou} \) in (c) 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.

In this approach, *lian*...*dou* and *lian*...*ye* are combined as follows. First, we look at a case with *dou* in (30). As discussed earlier, this sentence may have the ordinary semantic value and focus semantic value in (31a) and (31b) respectively, assuming there are only two alternative problems, problem 3 and problem 4, in this context.


(31) a. [John [di’erti]f dou zuochulaile] 0 = John solved problem 2
    b. [John [di’erti]f dou zuochulaile] f = {John solved problem 2, John solved problem 3, John solved problem 4}

What *dou* introduces to the sentence will be the presupposition in (32) that relates the above ordinary semantic value to the focus semantic value via the expectation of the speaker:

(32) The scalar presupposition *dou* 
    \[ \forall q [[ C (q) & q \neq ^{\wedge} p ] \rightarrow ^{\wedge} p > speaker-\text{expectation } q] \]

This says that for all propositions of the form q that are restricted by C, which are true, and they are not identical to the assertion, ^ p. That is, the assertion exceeds the expectation of q. In the case of (30), this means that the speaker expected that John would solve problem 3 or problem 4, but John’s solving problem 2 exceeded the expectation of the speaker. This gives rise to the scalar reading of the sentence.

Now we look at (33) that involves *lian*...*dou*. As shown in (34), when the *dou* statement combines with *lian*, its assertion (ordinary semantic value) and the alternative propositions (focus semantic value) remain the same as in the earlier case without *lian*. But *lian* here imposes a scalar relationship between the assertion and the alternative propositions: the assertion is less likely than the alternatives that are not identical to the assertion. Concretely, this says that *John solved problem 2* is less likely than *John solved problem 3* or *problem 4*. This implies that problem 2 is a difficult problem. This is compatible with the presupposition of *dou*, which requires that the assertion *John solved problem 2* exceeds the speaker’s expectation. This is because the requirement can only be satisfied when problem 2 is a difficult problem.

(33) John *lian* [di’erti]f dou zuochulaile [lian NP f + dou] ‘John solved even problem 2.’
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.

Now we look at the cases with *ye* and *lian...ye*. In (35) 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. As in (36), *ye* requires that there be a true statement that is not identical to the assertion. That is, it 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.

(35)        John [di’erti]f ye zuochulaile           [ NPf + ye]
             ‘John solved also problem 2.’

(36)        a. [John [di’erti]f ye zuochulaile ] 0 = John solved problem 2
             b. [John [di’erti]f ye zuochulaile ] f = {John solved problem 2, John solved problem 3, John solved problem 4 }
             c. The existential presupposition *ye*
             ∃q [ C (q) & q ≠ ^p]

(37) shows the meaning of the sentence with *lian...ye*. It differs from the *ye* statement in the added presupposition of *lian* in (38d). 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.

(37)        John lian [di’erti]f ye zuochulaile       [ lian NPf + ye]
             ‘John solved even problem 2.’

(38)        a. [John lian [di’erti]f ye zuochulaile ] 0 = John solved problem 2
c. The existential presupposition ye
   \[ \exists q \ [C(q) \& \neg q \neq \neg p] \]
d. The scalar presupposition lian
   \[ \forall q \ [(C(q) \& q \neq \neg p) \rightarrow q > \text{likely} \neg p] \]

However 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.

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

3. Implication

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.

First, (39) 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. When lian is added, as in (40), the scalar reading is salient but the distributive reading is not.

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13 This analysis raises many further issues such as the potential redundancy between lian and dou assuming both introduce scalarity, the dependence of lian on dou/ye, and scalarity of ye statements etc. In view of the space, I discuss only the ambiguity of dou here. I refer readers to Chen (2008) for discussions of other issues.

14 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\textsuperscript{stress} lai le
   they dou come-ASP
   ‘They all came.’

(ii) Lian [tamen] \textsuperscript{\#stress} dou/*dou\textsuperscript{stress} lai le
   even they dou come-ASP
   ‘Even they came.’
(39) Zheben shu, ta dou dule
this-CL book, he dou read-ASP
(i) ‘He has read all of this book.’ - Distributive, dou\textsuperscript{stressed}
(ii) ‘He has read even this book.’ - Scalar, dou\textsuperscript{unstressed}

(40) Lian [zheben shu]l, 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 (39) with a stressed dou and (40) with lian...dou can be seen in (41), 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 (40) involves a distributive reading at all, it is not the same as the one in (39). Thus the two dou’s should be separated.

(41) a. Zheben shu ta dou\textsuperscript{stressed} dule, * keshi hai meiduwan
this-CL book, he dou read-ASP but still not finish
‘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 see-ASP, but still not finish
‘He has read even THIS BOOK. But he hasn’t finished it yet.

A sentence with a plural NP shows the same ambiguity. For instance, our old example in (42) has both distributive reading and scalar reading:

(42) 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\textsuperscript{stressed}
(ii) ‘Even John and Mary drew a picture.’ - Scalar reading, dou\textsuperscript{unstressed}

In fact, to get the ‘scalar-distributive’ reading for (42), two dou’s can even appear overtly in the same sentence. As in (43), when scalar dou (dou\textsuperscript{scalar}) is in front of distributive dou (dou\textsuperscript{dist}), the sentence has the scalar-distributive meaning: That John and Mary each drew a picture was something the speaker had not expected.\textsuperscript{15}

\textsuperscript{15} 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.

(i) * [John he Mary]l dou\textsuperscript{dist} dou\textsuperscript{scalar} hua le yifuhua
(43) (Lian) [John he Mary]f dou\textsuperscript{scalar} dou\textsuperscript{dist} hua le yifuhua  
\hspace{1cm} even John and Mary dou dou draw -ASP one-CL picture  
(i) ‘Even John and Mary each drew a picture’  
(ii) * ‘Even John and Mary together drew a picture.’

In addition, that the sentence doesn’t have the ‘scalar collective’ reading as (43ii) indicates that the two dou’s are independently needed. That is, scalar dou doesn’t override the role of distributive dou and vice versa. I take the above as evidence that dou is indeed ambiguous.

4. Conclusion

This paper studied dou in lian...dou/ye constructions. It argued that dou is scalar itself and its scalarity is captured by relating it to the context-sensitivity of distributive dou. In this connection, we proposed to analyze lian as even that is viewed as involving only scalar presupposition but not existential presupposition. This analysis not only enabled us to capture the differences between lian...dou and lian...ye: the former has only scalarity and the latter has both scalarity and existentiality, it also revealed to us some interesting facts about the two dou’s that will otherwise remain hidden.

REFERENCES


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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 ]f dou meiyou dou mai zheben shu  
\hspace{1cm} 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 licensers. In his approach, scalar dou M-commands the focused element and distributive dou is C-commanded by its licenser. I refer the readers to his thesis for details.


