On embedded contrastive focus in Mandarin Chinese

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This article investigates the previously undocumented focus-sensitiveness of certain scope-bearing expressions in Mandarin, and argues that the syntactic effects of this property should be accommodated by a structure that involves multiple dependencies and inherited dependencies. At the empirical side, it is shown that in Mandarin, certain quantificational expressions as well as typical focusing adverbs have to occur at positions where they (i) c-command and (ii) be as close as possible to the contrastive foci that they associate with. The similarity to the typical association-with-focus configurations is captured under a unified Agree analysis that incorporated previous variable-adjunction-site analysis for focusing particles in German, while the additional dependencies in these structures are accounted for by multiple Agree and feature inheritance. This analysis is compared with some alternative approaches, which do not have equal empirical coverage or require more complex theoretical assumptions.

Keywords: association with focus, focus construction, quantificational construction, syntax-semantics interface, embedded contrastive focus

1. Introduction

Rooth (1985), Krifka (1990), and various other studies note that prosodic focus has effects on the truth-conditions of some adverbial and nominal quantificational constructions, as in (1) and (2) (the quantificational expressions are in boldface; the focus is marked by brackets with subscript \( F \)):

\[
\begin{align*}
\text{(1)} & \quad \text{a. } [\text{Mary}]_F \text{ always takes John to the movies.} \\
& \qquad \text{b. } \text{Mary always takes } [\text{John}]_F \text{ to the movies.} \\
\text{(2)} & \quad \text{a. } \textbf{Most} \text{ ships passed through the lock at } [\text{night}]_F. \\
& \qquad \text{b. } \textbf{Most} \text{ ships passed through the } [\text{lock}]_F \text{ at night.}
\end{align*}
\]
Although the focus-sensitiveness effects in these sentences may indicate that quantifiers like always and most are focus-sensitive expressions, previous studies generally classify them as a type of focus construction that is distinct from association with focus (AwF) constructions to avoid theoretical complications, and do not assume syntactic differences between the (a) and (b) examples.

The counterparts of these examples in Mandarin Chinese, however, shows that these different interpretational effects correspond to different syntactic structures. The following (a) and (b) examples demonstrate the interpretational effects of focus on quantificational constructions (they are called bound readings by Herburger (2000)). For completeness, I also include examples where focus do not directly interact with quantificational constructions, namely the (a’) and (b’) examples (called free readings by Herburger (ibid.)).

(3)  

a. Yizhi shi [Mary]_F dai John qu kan dianying.¹  
always shi M. take J. go see movie  
‘The person who takes John to the movies is always [Mary]_F.’  
(cannot be synonymous to other sentences in 3)  
a’. [Mary]_F yizhi dai John qu kan dianying.  
M. always take J. go see movie  
‘The person who always takes John to the movies is [Mary]_F.’  
(cannot be synonymous to other sentences in 3)  
b. Mary yizhi dai [John]_F qu kan dianying.  
M. always take J. go see movie  
‘The person who Mary takes to the movies is always [John]_F.’  
(cannot be synonymous to other sentences in 3)  
b’. Yizhi shi Mary dai [John]_F qu kan dianying.  
always shi M. take J. go see movie  
‘The person who Mary always takes to the movies is [John]_F.’  
(cannot be synonymous to other sentences in 3)  

1. An anonymous reviewer points out that a different lexical item, zongshi, which also means ‘always’, behaves like English always and does not need to c-command its bound focus:  
(i) a. [%[Mary]_F zongshi] dai John qu kan dianying.  
M. always take J. go see movie  
‘The person who takes John to the movies is always [Mary]_F.’  
b. Mary zongshi dai [John]_F qu kan dianying.  
M. always take J. go see movie  
‘The person who Mary takes to the movies is always [John]_F.’  

The reported well-formedness of (ia) may pose a challenge to the empirical claim made in the previous paragraph, and may indicate that Mandarin quantificational adverbs do not always show syntactic effects of focus-sensitiveness. However, (ia) is ill-formed for me and five of the seven native speaker informants I consulted, suggesting the existence of different varieties of
(4) a. **Dabufen de chuan dou zai [wanshang] F tongguo zakou.**  
most DE ship DOU at night pass.through lock  
‘The time when ships passed through the lock was mostly [nighttime] F.’  
(cannot be synonymous to other sentences in 4)  

a’. **Dabufen de chuan zai [wanshang] F dou tongguo zakou.**  
most DE ship at night DOU pass.through lock  
‘The time when ships mostly passed through the lock was [nighttime] F.’  
(cannot be synonymous to other sentences in 4)  

b. **Dabufen de chuan zai wanshang dou tongguo [zakou] F.**  
most DE ship at night DOU pass.through lock  
‘The place where ships passed through at night was mostly the [lock] F.’  
(cannot be synonymous to other sentences in 4)  

b’. **Dabufen de chuan dou zai wanshang tongguo [zakou] F.**  
most DE ship DOU at night pass.through lock  
‘The place where ships mostly pass through at night was the [lock] F.’  
(cannot be synonymous to other sentences in 4)  

Crucially, (a) and (b) examples in (3) and (4) illustrate the fact that quantificational expressions in Mandarin have to c-command the foci they bind, and, for those non-movable quantificational expressions, they have to adjacent to the foci if the later are preverbal.

In this article, I present an analysis of the previously undocumented focus-sensitiveness effects of scope-bearing expressions in Mandarin that treat them as AwF configurations, in which the focus belongs to a specific type of focus that I call the *embedded contrastive focus*. I show that when scope-bearing expres-
sions are focus-sensitive, they have to c-command and be close to their foci, just like typical focus-sensitive adverbs. To account for this, I propose that a null TP-external functional head X hosts a feature responsible for the merger of quantificational elements, and it assigns this feature to the focus it associates with, as in (5). This feature assignment mechanism works in concert with adjunct merger and A’-movement to derive the focus-sensitivity effects that are manifested syntactically.

(5) a. \[ [XP \ldots [TP \text{always} [TP \text{shi} [\text{Mary}]_F [T \ldots]]]] \] (the structure for (3a))

   \[ \overset{\text{feature assignment}}{\uparrow} \]

b. \[ [XP \ldots [TP \text{most ships} T [dou [sP at [night]_F [sP \ldots]]]]] \] (the structure for (4a))

The rest of the article is organized as follows. In Section 2, I present some empirical facts suggesting the existence of prosody-semantic correspondences in quantificational structures. In Section 3, I present and argue for the empirical claim that in Mandarin, there are syntax-semantics correspondences with regard to the focus-sensitiveness of quantifiers. In Section 4, I provide a syntax analysis of these correspondence effects in Mandarin under the Agree framework, in order to account for how the correspondence effects are licensed. In Section 5, I discuss some alternative analyses of the correspondence effects and compare them with my proposal. In Section 6, I provide an account for defocusing movements, a by-product of the focus-sensitivity of quantifiers. Section 7, I show that the empirical claim about quantifiers presented in Section 3 can be extended to cover what I call the secondary focus binding constructions first noted by Vallduví (1990). Section 8 is the conclusion.

2. The association-with-focus effects of quantifiers

As noted by Rooth (1985) and Krifka (1990) and various other studies, at least some quantifiers exhibit certain prosody-semantics correspondences that parallel those of typical focus-sensitive adverbs. I this section I present two empirical arguments for the existence of these correspondences in quantificational structures.

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2. There are some studies that regard the focus-sensitiveness of quantifiers as pragmatic effects instead of semantics effects (Beaver and Clark 2008; Hinterwimmer 2011; Krifka 2016, among others). However, it is also possible to treat them as semantic effects (see Rooth 1985; Krifka 1990; Herburger 2000). I will show in the next section that a purely pragmatic account is empirically false for Mandarin data.
2.1 Truth conditions

According to Rooth (1985), in sentences with quantificational adverbs, the position of focus has an effect on truth conditions (See also Huddleston and Pullum 2002:718). Krifka (1990) extends this observation to sentences with quantificational determiners.³ Consider (1) and (2) again, repeated below:

(6) a. [Mary]$_F$ always takes John to the movies.
   b. Mary always takes [John]$_F$ to the movies.

(7) a. Most ships passed through the lock at [night]$_F$.
   b. Most ships passed through the [lock]$_F$ at night.

Consider the bound readings (adopting Herburger’s (2000:29) terminology) for (6), which may appear when we are assuming that some people take some other people to the movies and we are wondering who takes whom to the movies how frequently. The truth conditions are as follows. If a non-Mary person, by himself or herself, ever took John to the movies, (6a) is false but (6b) may still be true. If Mary ever took a non-John person alone to the movies, (6b) is false but (6a) may still be true.

Consider the bound readings for (7), which may appear when we are assuming that some ships passed through some places at certain periods, and we are wondering how many of the ships passed through which places at which periods. If more than half ships that passed through the lock did so during the day, (7a) is false but (7b) may still be true. If more than half ships that passed through something at night passed through a non-lock place alone, (7b) is false but (7a) may still be true.

Contrasts about truth conditions are not present if we replace the quantifiers with non-quantifiers (cf. Partee 1991):

(8) a. [Mary]$_F$ took John to the movies yesterday.
   b. Mary took [John]$_F$ to the movies yesterday.

(9) a. These ships passed through the lock at [night]$_F$.
   b. These ships passed through the [lock]$_F$ at night.

The contrasts about truth conditions parallels those in only-focus constructions.

(10) a. Only [Mary]$_F$ took John to the movies.
    b. Mary only took [John]$_F$ to the movies.

³ Other types of quantificational expressions are also noted to interact with focus, including reason clauses (Dretske 1972), negation (Jackendoff 1972), yes-no questions (Jackendoff 1972), and various others. See Beaver and Clark (2008) for an extensive discussion.
If a non-Mary person took John to the movies, (10a) is false and (10b) can be true. Similar scenarios can be constructed for other sentences in (10) and (11) to show the truth-condition differences.

2.2 Continuation with inferences that involve substituted elements in the focus positions

For the position of the focus to have an effect on truth conditions is a sufficient condition for an expression to be focus-sensitive, but it is not a necessary condition. Adverbs such as *even* and *too* manifest interpretational effects on presuppositions, and other types of focus-sensitive expressions manifest other types of effects, as discussed in Kratzer (2004) and Krifka (2007). Therefore, to identify an expression as a focus-sensitive construction, we also need other types of evidence.

Since Rooth (1985), focus is commonly understood as a semantic entity that involves alternatives. Based on this understanding, an explicit definition of semantic focus is given by Krifka (2007):

(12) A property \( F \) of an expression \( \alpha \) is a Focus property iff \( F \) signals (a) that alternatives of (parts of) the expression \( \alpha \) or (b) alternatives of the denotation of (parts of) \( \alpha \) are relevant for the interpretation of \( \alpha \).

What this definition entails is that the relevance of alternatives is an essential ingredient of AwF constructions. This means that if we can tease apart this ingredient from a sentence by certain diagnostics, the sentence is an AwF construction, whether truth conditions are involved or not. We have already seen one way to do this in the previous subsection, which involves establishing truth conditions based on substituting alternative expressions for the original expressions. Another possible way to do this is go the opposite direction, namely to construct sentences using alternative expressions that can be validly inferred from the original sentences. With typical focus-sensitive adverbs, there are four steps to construct such inferences: (i) remove the focusing adverb; (ii) substitute the focused constituent \( \alpha \) with the alternative expression *non-\( \alpha \)*; (iii) either change the polarity of the sentence or keep it unchanged; and (iv) continue the original sentence, by another speaker, with *so, you are saying that* and this modified sentence. The inference effects can be observed with both *only-* and *even-* constructions. Note that if an unfocused element is substituted, the inference does not hold.

(13) a. A: Only \( [\text{Mary}]_F \) saw John.
   B: So, you're saying that non-Mary people didn't see John.

b. A: Mary only saw \( [\text{John}]_F \).
   B: ≠So, you're saying that non-Mary people didn't see John.
   B: So, you’re saying that non-Mary people saw John.

   b. A: Mary even saw [John]$_F$.
   B: #So, you’re saying that non-Mary people saw John.

On the other hand, when we take away the focusing adverbs and add non-focus-sensitive expressions like *yesterday*, the inference effects are absent:

   B1: #So, you’re saying that non-Mary people saw John.
   B2: #So, you’re saying that non-Mary people didn’t see John.

   B1: #So, you’re saying that Mary saw non-John people.
   B2: #So, you’re saying that Mary didn’t see non-John people.

We can also construct similar inference tests for quantifiers to show that quantifiers are focus-sensitive. With quantifiers, there are three steps to construct the inferences: (a) substitute the quantifiers with a specific type of quantifier, so that changing the polarity of the sentence with the substituted quantifier, with this quantifier taking wide scope, would be synonymous with the original sentence (e.g. *Everyone walks* = *No one is such that he or she doesn’t walk*); (b) substitute the focused element $\alpha$ with the alternative expression *non-$\alpha$*; (c) continue the original sentence, by another speaker, with *so, you are saying that* and this modified sentence.

Let us now return to Examples (1) and (2). Here, the quantifiers are *always* and *most*. For step (a), it is a straightforward task to find proper substitutes for them in the inference tests, as shown in (17).

       b. *Most* people walk. = *Less than half* people don’t walk.

With the substitutions for quantifiers identified, we can now construct the inference tests (only the bound readings are considered):

(18) a. A: [Mary]$_F$ *always* takes John to the movies.
    B: So, you’re saying that it’s *never* the case that non-Mary people by themselves took John to the movies.

   b. A: Mary *always* takes [John]$_F$ to the movies.
    B: *So, you’re saying that it’s never* the case that non-Mary people by themselves took John to the movies.

(19) a. A: *Most* ships passed through the lock at [night]$_F$.
    B: So, you’re saying that *less than half* ships passed through the lock during the day.
b. A: Most ships passed through the [lock]F at night.
B: #So, you’re saying that less than half ships passed through the lock during the day.

As shown in these examples, the validity of the inferences is dependent on the position of the focus. This indicates that there is a prosody-semantics correspondence that parallels what we have observed in typical focus constructions.

The facts about truth conditions and continuations with inferences appear to suggest that some kind of contrast is involved in the interpretation of the bound foci in quantificational expressions. These relevant constructions can therefore be regarded as a type of embedded contrastive focus constructions. In these constructions, contrastive focus is involved, but it is not bound by the typical contrastive focus operator that take the wide scope in a sentence.

3. The syntax-semantics correspondence effects in Mandarin Chinese

The existence of prosody-semantic correspondence effects of quantificational constructions that we have just seen leads to the possibility that quantificational constructions have hidden AwF structures. However, this possibility has not been considered in most studies of quantificational structures. The reason is that the effects are not obvious in English due to some obscuring properties of English: (a) there is no overt QR in English; (b) focus-sensitive expressions and locative/temporal adjuncts are at opposite directions from the verb; (c) English does not has a repair mechanisms for TP-adjunction (to be discussed in § 5.2.2). In this section, I show that Mandarin syntactic facts suggest that this possibility is real. In other words, the following statement holds:

(20) Syntax-semantics correspondence in quantificational structures
The focus-sensitiveness of quantificational expressions is reflected by overt structural differences in Mandarin Chinese.

3.1 Mandarin counterparts of Rooth’s and Krifka’s data

When we translate (1) and (2) into idiomatic Mandarin sentences, we find that different expressions in focus correspond to different syntactic structures, as shown in (3) and (4), repeated below:

always shi M. take J. go see movie  
‘The person who takes John to the movies is always [Mary]F.’
(cannot be synonymous to other sentences in 21)  

a’. [Mary]F **yizhi** dai John qu kan dianying.  
M. always take J. go see movie  
‘The person who always takes John to the movies is [Mary]F.’
(cannot be synonymous to other sentences in 21)  

b. Mary **yizhi** dai [John]F qu kan dianying.  
M. always take J. go see movie  
‘The person who Mary takes to the movies is always [John]F.’
(cannot be synonymous to other sentences in 21)  

b’. **Yizhi** shi Mary dai [John]F qu kan dianying.  
always shi M. take J. go see movie  
‘The person who Mary always takes to the movies is [John]F.’
(cannot be synonymous to other sentences in 21)  

(22) a. **Dabufen** de chuan dou zai [wanshang]F tongguo zakou  
most de ship dou at night pass.through lock  
‘The time when ships passed through the lock is mostly [nighttime]F.’
(cannot be synonymous to other sentences in 22)  

a’. **Dabufen** de chuan zai [wanshang]F dou tongguo zakou  
most de ship at night dou pass.through lock  
‘The time when ships mostly passed through the lock is [nighttime]F.’
(cannot be synonymous to other sentences in 22)  

b. **Dabufen** de chuan zai wanshang dou tongguo [zakou]F  
most de ship at night dou pass.through lock  
‘The place where ships passed through at night is mostly the [lock]F.’
(cannot be synonymous to other sentences in 22)  

b’. **Dabufen** de chuan dou zai wanshang tongguo [zakou]F  
most de ship dou at night pass.through lock  
‘The place where ships mostly pass through at night is the [lock]F.’
(cannot be synonymous to other sentences in 22)  

To see that these examples involve different interpretations, let us examine their truth conditions. Suppose, for the bound readings of (21), that we are assuming that some people take some other people to the movies and we are wondering who

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5. To help tease apart different readings, in the translations of Mandarin I use relative clauses as paraphrases of the readings, similarly to Herburger’s (2000:29) paraphrases of sentences with negation and focus.

6. The examples in (22) can either be interpreted in the present tense or past tense. This does not affect our discussion.
takes whom to the movies how frequently. In this context, if a non-Mary person, by himself or herself, ever took John to the movies, (21a) is false but (21b) may still be true. If Mary ever took a non-John person alone to the movies, (21b) is false but (21a) may still be true. (21a’) and (21b’), on the other hand, can only have free readings and require different contexts. (21a’) is felicitous when it is established that someone enjoys John’s company at movies and always takes John to the movies when that person is going to movies, and we are wondering who that person is. (21b’) is felicitous when it is established that Mary is very possessive toward someone, in that she takes that person to the movies but does not allow other people to do so; and we are wondering who that person is.

Consider now examples in (22). Suppose, for the bound readings, that we are assuming that some ships passed through some places at certain periods, and we are wondering how many of the ships passed through which places at which periods. If more than half ships that passed through the lock did so during the day, (22a) is false but (22b) may still be true. If more than half ships that passed through something at night passed through a non-lock place alone, (22b) is false but (22a) may still be true. (22a’) and (22b’) only have free readings and require different contexts. (22a’) is felicitous when it is established that, compared to other places, the lock is safer to pass through at a certain period, and most ships that pass through some place at that period pass through the lock, and we are wondering what that period is. (22b’) is felicitous when it is established that, compared to other periods in a day, a certain place is safer to pass through at night, and most ships that pass through that place at some period do so at night, and we are wondering what that place is.

With the semantic interpretations of the examples established, let us now turn to the syntactic structural facts in (21) and (22). In (21), with the bound readings, the frequency adverbial yizhi has to c-command the focus, and be as close to the focus as possible, in that yizhi cannot occur in the sentence-initial position if the focus is vP-internal. If the c-command and closeness conditions are not met, only free readings are available. Similar syntax-semantic correspondences hold in (22). With bound readings, both the quantified DP dabufen de chuan and the quantificational marker dou have to c-command the focus, and dou has to be as close to the focus as possible, in that dou cannot be separated from the verb by an expres-

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7. Example (21a) is somewhat complicated by the obligatory presence of the focus marker shi. I assume that this is due to some morphosyntactic condition that prevents some Mandarin adverbials from merging with TPs that begin with non-quantificational DPs not supported by shi. See § 4.2.1 for motivations for this analysis.
sion if the focus is vP-internal. When the c-command and closeness conditions are not met, only free readings are available (22a’,b’).

The syntactic facts discussed here support the empirical claim stated in (20). The syntactic positions of quantificational elements like yizhi and the dabufen de NP (in the subject position)…dou sequence are sensitive to the positions of the bound foci in Mandarin.

3.2 Movement of quantified DPs objects in Mandarin

In addition to the facts discussed above, the syntactic distributions of the landing sites of moved quantified object DPs in Mandarin are also sensitive to the syntactic positions of the bound foci. The relevant facts are illustrated in the following examples:

(23) Lisi [dabufen de gongzuo], dou zai [wanshang], zuo t_i
   L.  most  DE task  DOU at  night  do
   ‘The time when Lisi does his tasks is mostly nighttime.’
   (cannot be synonymous with other sentences in 23)

a’. Lisi zai [wanshang], [dabufen de gongzuo], dou zuo t_i
   L.  at  night  most  DE task  DOU do
   ‘The time when Lisi mostly does his tasks is nighttime.’
   (cannot be synonymous with other sentences in 23)

b. Lisi zai wanshang [dabufen de gongzuo], dou [zuo], t_i
   L.  at  night  most  DE task  DOU do
   ‘The choice the Lisi makes about whether to do tasks at night is mostly to do them.’
   (cannot be synonymous with other sentences in 23)

b’. Lisi [dabufen de gongzuo], dou zai wanshang [zuo], t_i
   L.  most  DE task  DOU at  night  do
   ‘The choice the Lisi mostly makes about whether to do tasks at night is to do them.’
   (cannot be synonymous with other sentences in 23)

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8. There are many analyses of the quantificational expression dou, including those reviewed in Li (2014). For ease of exposition, here I will simply regard it as a quantificational marker that is syntactically sensitive to the position of the bound focus discussed here.

9. The fact that the closeness condition is only applicable for yizhi and dou is due to the fact that they are not easily movable (cf. Li and Thompson 1981). More precisely, as I will argue for in § 4.2.1, they are only movable when triggered by focus-related features. Quantified DPs like dabufen de chuan may more freely undergo movement and obscure the effects of the closeness condition.
c. Zai wanshang [dabufen de gongzuo], dou shi [Lisi] t j zuo t i 10
   at night most de task dou shi L. do
   ‘The person who does tasks at night is mostly Lisi.’
   (cannot be synonymous with other sentences in 23)

c’. Zai wangshang [Lisi] t j [dabufen de gongzuo], dou zuo t i
   at night L. most de task dou do
   ‘The person who mostly does tasks at night is Lisi.’
   (cannot be synonymous with other sentences in 23)

For sentences with bound readings (23a,b,c), let us assume that some people do some tasks at certain periods in a day, and we are wondering when which person does how many tasks in what way. In this context, if less than half of his tasks done by Lisi are done at night, (23a) is false but (23b) and (23c) may still be true. If less than half tasks that Lisi should do at night are done by Lisi, (23b) is false but (23a) and (23c) may still be true. If less than half tasks that people do at night are done by Lisi, (23c) is false but (23a) and (23b) may still be true.

The syntactic facts in (23), once again, show that different positions of the bound foci correspond to different positions of the quantificational expressions. When a quantificational object DP moves to a preverbal position, it has to c-command the bound focus, and dou has to be as close to the latter as possible. Otherwise, only the free readings are available, as in (23a’,b’,c’). The empirical claim (20) once again gains support.

The syntactic-semantics correspondence effects of Mandarin observed so far are summarized in the following table.

Table 1. Syntactic reflexes of focus-sensitiveness of quantificational expressions in Mandarin

<table>
<thead>
<tr>
<th>Need the Q-expression c-command the bound focus?</th>
<th>Less-movable Q-Adverbials</th>
<th>Q-Subjects</th>
<th>Moved Q-Objects</th>
<th>Less-movable Q-marker dou</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

10. The intended reading is not available if the temporal adverbial is not moved to a pre-dou position. This seems to suggest that if vP-external non-focused elements are in the c-command domain of focus-sensitive expressions, the former is preferably moved out of this domain. I will discuss this movement in more detail in § 5.2.2.
To the extent that (20) is a valid descriptive generalization, it is unexpected for the commonly assumed structures of adverbials and A’-moved expressions:

\[(24)\]

\[\begin{array}{c}
\text{always/yizhi} \\
\text{most ships/daben de chuan}
\end{array}\]

(24a) is the structure for the adverbial *always* proposed by Cinque (1999); (24b) is the structure of universally quantified DPs proposed by Beghelli and Stowell (1997). Under the assumption that adverbials are licensed by spec-head feature checking in the clausal spine regulated by a universal functional hierarchy, the adverbial *always/yizhi* can only occur in a fixed Spec;Asp\(^{\text{perfect}}\) position. Based on similar reasoning, the quantified DP *most ships/daben de chuan* is moved to a fixed Spec;DistP position either overtly or covertly (depending on the parametric setting of the language) as a case of feature-driven movement. Since Spec;Asp\(^{\text{perfect}}\) and Spec;DistP occupy fixed positions in the clausal spine, neither of these analyses allows the merging positions quantificational expressions to be affected by the positions of focused expressions in the sentence. To derive the facts, we need to either update the standard approach or look for an alternative one.

4. The structure of quantificational expressions in Mandarin

4.1 Theoretical assumptions

Büring and Hartmann (2001) and Reis (2005) propose an influential analysis of focus-sensitive particles (FPs) in German that does not involve spec-head feature checking. According to them, a sentence like (25a) involves adjoining an FP to a verbal projection that is lower than the surface positions of the subject, and the object is moved to a position that c-commands the FP, as depicted in (25b).

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11. This analysis is also assumed by Lin (1998). Other scope-bearing expressions, like focused nominal expressions, are also generally argued to be moved to a fixed preverbal, TP-internal position (Ernst and Wang 1995; Shyu 1995; Zhang 1997; Soh 1998; Tsai 2008a, b, among others).

12. These two analyses differ in that Büring and Hartmann argues FPs are exclusively adverbials, while Reis argues that FPs can adjoin to DPs. Nevertheless, both of them adopt an adjunction approach to FPs.
(25) a. ... weil Peter Maria nur t₁ [küsste]₆.
   because P. M. only kissed
   ‘...because Peter only [kissed]₆ Maria.’

b. ...TP
   Peter
   ...VP
   Maria₄
   VP
   nur
   VP
   t₁
   [küsste]₆

This position for the FP is where it obeys the following two conditions, as noted by the above authors:¹³

(26) a. FPs must c-command the foci they associate with.
   b. FPs are as close to the foci they associate with as possible.

The motivations for this analysis are as follows: (i) FPs in German do not occur in fixed positions, (ii) the variable positions are conditioned by the positions of the associated focus. We have seen their VP-adjunction structure in (25b). A case of TP-adjunction in their analysis would be the example in (27):

   I think that only someone someone.DAT a prank play want
   ‘I think that someone only wanted to play a prank on someone.’¹⁴

(Jaeger & Wagner 2003)

If the FP nur is placed in other positions in (25a) and (27), the sentences will be ill-formed with the intended meaning. This shows that the conditions in (26) are in effect.

The adjunction-based analysis, in its original form, however, does not explain how the focus-sensitive adjuncts are licensed. One answer to this problem is offered by Shu (2011), which treats focus-sensitive adverbs as agreement markers, merged as phrasal affixes. In this approach, the merger of adverbs like only is licensed by Agree, which is akin to the one that licenses inflectional affixes like the

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¹³. Reis (2005) differs from Büring and Hartmann (2001) in that the former allows VP-internal FPs to violate the closeness condition.

¹⁴. Büring and Hartmann and Reis do not provide examples that clearly show that FPs can attach to the TP, as opposed to the subject DP where the latter is the focus. The example given here is clearly a case of TP-adjunction, if condition (26a) is correct.
past tense marking -ed. To illustrate how this works with the simplest case, consider the sentence *John likes only Mary*. According to Shu, there is a silent clausal functional head X bearing an interpretable [Id(entification)] feature with the value E(xhaustive)I(dentification).\(^\text{15}\) Agree between this feature and a matching uninterpretable feature on *Mary* is accompanied by feature valuation of the \([uId]\) on *Mary*, which is realized by (countercyclically) merging *only* with the DP *Mary*. This Agree structure is illustrated in (28):

\[
(28)
\]

More complicated structures involve merging focusing adverbs with clausal projections, such as a vP or a TP. In these cases, the expression bearing the focus still carries the uninterpretable feature to be matched and valued by a feature in a clausal functional head, but here the structures may involve large-scale pied-piping during the realization of the feature-valuation process. The large-scale pied-piping allows the focusing adverbs to adjoin to clausal projections that contain the focus.\(^\text{16}\) To illustrate, Examples (25a) and (27) involve the following structures in this analysis:

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\(^\text{15}\) The view that clausal operators bear interpretable features is also assumed by Zeijlstra (2004, 2012), and Haegemann and Lohndal (2010), among others.

\(^\text{16}\) Since the adjunction process does not involve movement, at least when the merger takes place, this type of pied-piping should be more precisely regarded as something like a kinship by marriage process. For ease of exposition, I will follow Shu and use the more familiar term.
In both structures, one or more elements within a clausal projection are the focused elements associated with the focusing operator. Features on these elements pied-pipe the immediate dominating clausal projection for the value realization of the feature valuation operation. Thus, VP is the merging site of *nur* in (29a), whereas TP is the merging site of *nur* in (29b). *Nur* can be regarded as a ‘phrasal affix’ since it is an agreement marker that attaches to a phrase.

The adjunction-based analysis of FPs in German departs from the specifier-based analysis of adverbials in that the former allows FPs to occur in various positions in the clausal spine. The different positions of FPs in (25a) and (27), under Shu’s approach, is a direct consequence of the less restricted nature of probe-goal dependencies, which can derive different adjunction sites even when the focusing operator is located in the same functional head. For theories that allow only fixed positions of adverbials, one would need to postulate additional mechanisms to derive the same facts, such as (a) repetitions of focus-related projections in the clausal spine (cf. Belletti 2004; Grewendorf 2005; Aldridge 2010, a.o. for pro-

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17. I assume, following Irurtzun (2007), that all the focused elements are specified with focus-related features. In the current cases, they are uninterpretable features that need to be matched and valued.
posals of an expanded vP edge that mirrors the split-CP domain); or (b) a structure where FPs only attach to the VP (assuming the subject DP is in Spec;VP in German) and all unfocused elements are obligatorily moved to positions outside the FP and its adjunction site (cf. Sudhoff 2010). In view of the fact that Agree is assumed to be universally available, whereas the alternative approaches to functional elements and information structure do not have significant theoretical advantages (see Section 5 for more details), I will follow Shu’s Agree approach to focus-sensitive expressions.

4.2 The Agree structure of quantificational constructions

If we want to apply the Agree-based adjunction analysis of typical focusing adverbs to quantificational expressions discussed in Section 3, we still need additional mechanisms to derive the syntactic distributional facts. This is because that in quantificational constructions, there are two expressions that need to enter A’-dependencies with a c-commanding head, the quantificational expression and the bound focus, where as in typical focus constructions only one expression does: 18

(30) a. Typical focus construction
   X … Focus
   needs to enter A’-dependency with X

b. Quantificational construction
   X … QuE … Focus (bound by the quantificational operator)
   needs to enter A’-dependency with X

In order to provide an Agree analysis for construction (30b), specifically the c-command condition and the closeness condition effects discussed in Section 3, we need to allow (i) two expressions to enter A’-dependency with a c-commanding head, and (ii) one of the lower members in the Agree structure to determine the landing site of the other lower member in the Agree structure. To make these accommodations, I propose that construction (30b) involves a type of multiple Agree (Hiraiwa 2000, 2005; Boeckx 2004; Zeijlstra 2004, 2012), where both the QuE and the focus bear uninterpretable features that need to be matched and valued, and that it also involves a type of feature inheritance, 19 where a c-

18. This simple structure of typical focus constructions will be revised. See Section 7.

19. This type of feature inheritance is different from the familiar C-to-T feature inheritance (Richards 2007; Chomsky 2007, 2008), since the head being assigned an [EPP] feature need not be a fixed category.
commanding member of an Agree structure assigns its movement-triggering EPP feature to another expression, causing movement to land at the edge of the minimal verbal projection containing the latter expression, as in (31).

(31) **Feature inheritance under multiple Agree**

\[ X \quad \text{Focus} \quad \text{QuE} \]
\[ [F_p, EPP] [EPP/F_{G1}] [F_{G2}] \quad (F_p = \text{probing feature}, F_G = \text{goal feature}) \]
\[ \text{fi. triggering Move} \quad (\text{fi. = feature inheritance}) \]

**Multiple Agree**

\[ 4.2.1 \text{ Quantificational adverb constructions} \]

Let us now apply this analysis of quantificational constructions to Examples (3a) and (3b), repeated below:


\hspace{1cm} always shi M. take J. go see movie

‘The person who takes John to the movies is always Mary.’

b. Mary **yizhi** dai [John] F qu kan dianying.

\hspace{1cm} M. always take J. go see movie

‘The person who Mary takes to the movies is always John.’

Consider (32b) first, where **yizhi** is in its typical pre-verbal and post-subject position (cf. Li and Thompson 1981). According to the present account, there is a clausal head bearing an interpretable feature and a movement-triggering feature. Let us assume the head to be Qu, the former feature to be [iQu: always], and the latter feature to be [EPP]. Due to the fact that **yizhi** can precede the subject DP, I assume the null Qu head is higher than T₀, but is still c-commanded by the head that carries tense information, which is C₀, according to Chomsky (2008). In addition, according to our account there are two uninterpretable features. One is at the quantificational expression, while the other is at the focused expression. Let us assume the one at the focused expression John is [uQu₁], and the one at the quantified expression yizhi is [uQu₂], as in (33a). [iQu: always] undergoes multiple Agree with [uQu₁] and [uQu₂], matching and valuing the latter two features. In addition, the movement-triggering feature [EPP] is assigned to the focused expression John, from which position regulates the position of the adverb **yizhi**. Here, since **yizhi** already c-commands the inherited [EPP]-bearer, there is no need for the former to move, so **yizhi** is licensed in-situ, as in (33b).
Next consider (32a), which requires some additional discussion before we talk about its focus structure, since *yizhi* is now followed by an element *shi* and a TP. Here, I assume that *shi* is a clitic element that can merge with a TP, and this clitic serves as a PF repair mechanism for the merger of the adverb *yizhi*. The repair mechanism is required because certain adverbs may be lexically specified so that they can only merge with verbal elements (which are commonly known as ‘non-movable adverbs’ in the literature of Mandarin syntax).

20 Assuming that *shi* is a clitic...
clitic with a verbal feature, it follows that the adverb *yizhi* can merge with a *shi*-initial TP without violating its lexical specification.

There are some empirical facts that support the above clitic analysis of *shi* in (32a).21 First of all, the sentence-initial *shi* in quantificational constructions is only possible when the expression immediately following *shi* is the subject DP. If other expressions follow *shi* and precede the subject DP, the sentences are ill-formed, as in (34). The facts are puzzling if *shi* is treated as a regular copular and the expressions following *Mary* are associated with a null expletive subject in (32a) (akin to *It is always Mary that takes John to the movies*), because the ill-formedness of (34a) and (34b) shows that non-subject foci cannot be in this position. On the other hand, under our clitic analysis, the contrast between (32a) and (34) is a direct consequence of the fact that embedded contrastive focus in Mandarin can only involve in-situ focalization, and do not involve English-like cleft constructions that rely on copulas.

(34) a. *Yizhi*  

```
  shi   [John]_F   Mary   
 always   shi J.   M.  take go see movie
  
  ‘Intended: The person that Mary takes to the movies is always [John]_F.’
  
  b. *Yizhi*  

```

```
  shi zai [zaoshang]_F   Mary   
 always   shi at morning   M.   take J.   go see movie
  
  ‘Intended: The time that Mary takes John to the movies is always in the 
  [morning]_F.’
```

Second, post-subject occurrences of *shi* in quantificational constructions are possible, but they are always optional, as in (35). This is unexpected in an analysis that treats *shi* as a raising verb that allow various non-focused constituents to move

(ii) A: What's the matter? B: (*Just) there is (just) nothing to do.

21. As noted by an anonymous reviewer, the present clitic analysis of *shi* in quantificational constructions does not seem to be compatible with certain recent analyses of *shi* in the better-known cleft *shi*...*de* sentences, such as the bi-clausal accounts of Cheng (2008) and Paul and Whitman (2008). The reviewer further notes that all good *shi*-sentences in this article also allow a sentence-final *de*, suggesting parallels between cleft *shi*...*de* sentences and quantificational *shi*...*de* sentences discussed here. While I will not be able to offer conclusive evaluative comments about those studies of cleft *shi*...*de* sentences, I believe there are reasons to treat cleft *shi*...*de* sentences and quantificational *shi*...*de* constructions as distinct constructions in terms of their syntactic and PF properties. First of all, while cleft *shi*...*de* sentences are usually translated into English sentences in the *it*-be-FOCUS-*that*-S form, quantificational *shi*...*de* sentences can be translated into non-cleft sentences like (1) and (2). Second, there are no subject-object asymmetries with regard to whether *shi* is optional in cleft *shi*...*de* sentences, whereas quantificational *shi*...*de* constructions manifest subject-object asymmetries (cf. Example (32a) and Example (35)).
across it. Such an analysis wrongly predicts shi to be equally obligatory or optional in all environments. In our analysis, the obligatory presence of shi in (32a) and its optionality in (35) is a consequence of shi being a clitic that serves as a repair mechanism for TP-adjoining adverbs.

   M. always shi take J. go see movie
   ‘The person that Mary takes to the movies is always John.’

      M. always shi at morning take J. go see movie
      ‘The time that Mary takes John to the movies is always in the morning.’

Third, the use of shi in examples like (32a) seems to be a Mandarin-specific phenomenon. English and German do not have any similar elements when the bound focus is the subject DP:

(36) a. [Mary]F always takes John to the movies. (= (1a))

   b. weil meistens [der Friedrich]F zu spät kommt. (Herberger 2000)
      because usually the F. too late comes
      ‘The person who comes late is usually Friedrich.’

If shi is a lexical verb in (32a), it is mysterious why it is absent in languages like English and German, even though examples in (36) involve similar focus semantics. In our clitic analysis, the contrast is not a problem. Since the clitic shi is a language-specific repair mechanism for a syntactic condition on certain adverbs, it needs not be available in languages like English, which adopts a vP-adjunction strategy, or German, which does not seem to have the ban on TP-merging quantificational adverbs.

Assuming the clitic analysis of shi, let us return to the focus structure of (32a). According to the present feature inheritance under multiple Agree account and the clitic analysis of shi, what makes (32a) different from (32b) is the different location of the [uQu₁] feature. This feature is now on the focused subject DP Mary, as in (37a). Feature inheritance assigns the [EPP] feature on the Qu head to Mary, triggering the movement of the quantificational adverb yizhi to the edge of the minimal clausal projection that contain Mary, which is TP in this case.²³

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²². vP-adjunction of Q-adverbs is not always licit in English, however. As noted by Hinterwimmer (2008:85ff.), the wide-scope interpretation of the Q-adverb in the sentence Usually, every dog barks requires the Q-adverb to precede the quantified subject DP.

²³. A consequence of this account is that some of the adverbs that Li and Thompson (1981) consider as non-movable are in fact movable. In the present account, movement is only possible when a preverbal expression is the bound focus and suitable repair mechanisms, if needed, are implemented.
while, the clitic *shi* is inserted as a repair mechanism for the *yizhi*-TP merger, as in (37b).

(37) a.

4.2.2 Quantificational DP constructions

Nominal quantificational constructions such as (4a) and (4b) are mostly similar to adverbial quantificational constructions. They are only slightly different. For one, as mentioned in note 9, quantified subject and object DPs only need to obey the c-command condition, and they do not need to obey the closeness condition, since they may undergo further movement. For another, preverbal occurrences of the quantificational determiner *dabufen* need to be paired up with the expression *dou*. These differences are due to some independent properties of nominal expressions and the idiosyncratic property of universal nominal quantifiers, and can be easily accommodated in the present account.

Examples (4a) and (4b) are repeated below:

(38) a. **Dabufen de chuan dou zai [wanshang]F tongguo zakou.**
   most DE ship DOU at night pass.through lock
   ‘The time that ships passed through the lock is mostly at [night].’

b. **Dabufen de chuan zai wanshang dou tongguo [zakou]F.**
   most DE ship at night DOU pass.through lock
   ‘The places that ships passed through at night are mostly the [lock].’
Consider first (38a=4a). Like the structure of *yizhi*-constructions, it has a Qu head that bears an interpretable feature and an EPP feature. Let us assume the former is \([iQu: \text{most}]\). Let us assume that the head of the PP containing the focused temporal expression *wanshang* bears an \([uQu_1]\) feature,\(^{24}\) and the QuE *dabufen* bears an \([uQu_2]\) feature. In addition, I assume, following Ernst (2002), that temporal adjuncts can be vP-adjuncts, so *zai wanshang* is adjoined to vP, c-commanded by the surface position of the subject. As mentioned above, one thing that sets this structure apart from the one in (37) is the mandatory presence of *dou*. Since *dou* obeys the closeness condition (see §3.1), I assume it is a type of focus marker like those discussed in §4.1, which is syntactically like an agreement marker and is not present before Agree takes place, as in (39a).\(^{25}\) Next, multiple Agree applies between the interpretable feature and the two uninterpretable features, licensing their A′-dependency and triggering feature valuation. I assume *dou* is an obligatory value realizer for the \([uQu_1: \text{most}]\) feature. Like *yizhi*, it can only merge with clausal projections. So it merges with the minimal vP that contains the PP *zai wanshang*. Feature inheritance assigns the [EPP] feature on Qu to the P head *zai*, from which the position of the QuE *dabufen de chuan* is regulated. ~Here, since the QuE already c-commands the inherited [EPP]-bearer, there is no need for the former to move, so *dabufen de chuan* is licensed in-situ, as in (39b).

(39) a.

\[\begin{array}{c}
\text{QuP} \\
\text{Qu} \\
[iQu: \text{most, EPP}] \\
\text{dabufen de} \\
\text{chuan \([uQu_2:]\)} \\
\text{...vP} \\
\text{zai \([wanshang]\_f} \\
\text{\([uQu_1:]\)} \\
\text{vP} \\
\text{tongguo zakou}
\end{array}\]

\(^{24}\) Although only a part of the PP is in prosodic focus, I assume the whole PP to enter A′-dependency with a probing feature, following Krifka’s (2006) and Wagner’s (2006) analyses of focus constructions.

\(^{25}\) An agreement-like analysis of the focus-marking *dou* is also proposed by Hole (2004), which mainly discusses *lian…dou* ’even’ constructions.
In (38b), the situation is similar, but now the focus is on the object DP zakou, and it is this expression that bears the \([uQu]\) feature. According to the present account, \(dou\) is again not present before Agree takes place, as in (40a). Multiple Agree applies and the uninterpretable features are valued. To realize the value for \([uQu;\ most]\), \(dou\) again merges with the minimal \(vP\) that contains the feature-bearer, which is tongguo zakou in this case. Feature inheritance assigns the [EPP] feature on Qu to the expression zakou. Since the quantified subject DP dabufen de chuan already c-commands the expression, there is no need for the subject DP to move, as in (40b).

(40) a. 

\[
\begin{array}{c}
\text{QuP} \\
\text{Qu} & \text{TP} \\
\text{[iQu: most, EPP]} & \text{dabufen de chuan \ldots vP} \\
\text{realizer of \([uQu;\ most]\)} & \text{[uQu;\ most]} \\
\text{f. i.} & \text{zai [wanshang]}F \\
& \text{[EPP, \([uQu]\; most]\]} \\
& \text{tongguo zakou} \\
\end{array}
\]
Let us now consider cases when the object DP is the QuE discussed in § 3.2, which generally involve focus-induced movements, as in (23a,b,c), repeated in (41).

(41) a. Lisi [dabufen de gongzuo]_{i} dou zai [wanshang]_{F} zuo t_{i}.
   L. most de task dou at night do
   ‘The time that Lisi does his tasks is mostly at [night]_{F}.’

b. Lisi zai wanshang [dabufen de gongzuo]_{i} dou [zuo]_{F} t_{i}.
   L. at night most de task dou do
   ‘The choice the Lisi makes about whether to do tasks at night is mostly this one: to [do]_{F} them.’

c. Zai wanshang, [dabufen de gongzuo]_{j} dou shi [Lisi]_{F} t_{j} zuo t_{i}.
   at night most de task dou shi L. do
   ‘Mostly, the person who does tasks at night is [Lisi]_{F}.’

The structures of examples in (41) all involve object movement. These movement structures are all regulated by feature inheritance in the present account. Consider first the structure for (41a). Things work as before, but now the bearer of the inherited [EPP] feature is outside the vP and the element targeted for movement is base-merged inside the vP, as in (42a). Assuming that sideward movement in the sense of Nunes (2001) is available, the EPP feature on P attracts the movement of the quantified object DP. Assuming further that internal merge mediated by feature inheritance can only choose clausal constituents as sister constituents of moved elements, the minimal clausal constituent containing the bound focus is merged with the moved quantified object DP, as in (42b). The value realizer dou, being a focus marker, still has to be as close to the focus as possible, and therefore cannot be merged above the moved QuE.
The structures of Examples (41b) and (41b) involve similar mechanisms. In the structure for (41b), the bearer of the inherited [EPP] is the verb zuo. It triggers the movement of the quantified object DP to the edge of the vP that does not contain the temporal adjunct, as in (43a). In the structure for (41c), the bear of the inherited [EPP] feature is the subject DP. Again, assuming that movement mediated by feature inheritance can only choose clausal constituents as sister constituents of moved elements, the minimal clausal constituent containing the subject DP, TP, is the one that merges with the moved quantified object DP, as in (43b). Due to the PF requirement of the adverbial dou, the clitic shi has to be inserted as a repair mechanism, similarly to what happens with yizhi in similar structures discussed in the previous subsection.
To sum up, in this section I have presented an analysis of the focus structure of quantificational constructions based on an updated version of adjunction-based analysis of focus-sensitive adverbs under the Agree framework. The syntactic facts presented in Section 3 are accounted for by an analysis that incorporates multiple Agree and a special type of feature inheritance. The positions of Q-adverbs like yizhi and Q-DPs like dabufen de chuan are regulated by feature inheritance of the EPP feature and syntactic movement, when available. The presence and distribution of the concord-like adverbial dou are regulated by the
feature valuation of Agree between the feature on a clausal Qu head and the feature on the bound focus.

5. Comparisons with alternative approaches

The account of the syntactic effects of focus-sensitiveness of QuEs in Mandarin presented in Section 4 departs from some alternative approaches to the focus-sensitiveness of QuEs and to focus-sensitive adverbials that have been proposed in the literature. One approach maintains that the interpretational differences associated with the choice of the placement of focus are due to pragmatic differences and have no bearings on the syntax-semantics interface. Another approach maintains a view of focusing adverbials that only allow them to have fixed positions in the clausal spine. I will show that these approaches either make incorrect empirical predictions or require more complicated theoretical assumptions.

5.1 The focus-sensitiveness of QuEs is a purely pragmatic phenomenon

Based on the standard view that quantificational constructions contain the scope argument and the restrictor argument, and the fact that quantificational expressions do not merge with the apparent restrictor argument when focus semantic effects are present, some linguists argue that English examples like (1) and (2), repeated below, do not involve different semantic representations, nor do they involve different syntactic structures. Instead, they involve distinct pragmatic processes.

(44) a. [Mary]$_F$ always takes John to the movies.
   b. Mary always takes [John]$_F$ to the movies.

(45) a. Most ships passed through the lock at [night]$_F$.
   b. Most ships passed through the [lock]$_F$ at night.

More specifically, according to Beaver and Clark (2008), a representative pragmatic-based account of focus effects of QuEs, sentences (44a=1a) and (44b=1b) involve an identical semantic representation. Taking always to quantify over a set of events, represented by $\sigma$, their semantic analysis for both examples would be the one in (46):

(46) $\forall e \in \sigma (Mary \text{ takes } John \text{ to the movies in } e)$

26. See also Hinterwimmer (2011), Krifka (2016), and reference cited there.
This quantificational semantics then interacts with the focal meanings in the two examples via a context-related pragmatic mechanism called *local accommodation*, which derives the two different restrictor arguments of the examples (namely $\sigma$), and their different truth conditions, represented below:

(47)  
(a) In each of some salient set of events of someone taking John to the movies, Mary took him to the movies.  
(b) In each of some salient set of events of Mary taking someone to the movies, she took John to the movies.

Similarly, $(45a=2a)$ and $(45b=2b)$ also involve identical semantic representations, as in (48), under this account.

(48)  
*For every ship $x$ in $C$, $x$ passed through the lock at night.*

Again, this semantic representation goes through context-related pragmatic processes in two examples with different focus placements, and as a result we get different restrictor arguments and truth conditions of examples in (45):

(49)  
(a) For every ship $x$, $x$ passed through the lock during some interval, $x$ passed through it at night.  
(b) For every ship $x$, $x$ passed through some place at night, $x$ passed through the lock then.

In addition to various theoretical issues that need to be hammered out, such as the allowance for focus to be either present in the semantics or pragmatics, this account is unable to cope with the syntactic facts in German (see note 4) and Mandarin discussed in Section 3. According to this account, focus in quantificational constructions plays no roles in the mapping from syntax to semantics, just as focus plays no roles in the syntax and semantics of answer sentences in different question-answer pairs, but the relevant Mandarin examples in Section 3 indicate that focus does play a role in overt syntactic structures.

The account adopted in this paper does not have these problems, although it needs to be supplemented by suitable semantic analyses that are able to accommodate both the restrictor-scope based quantificational semantics and the relevant focus semantics. Although I will not be able to provide specific semantic analyses here, I assume the empirical facts in Section 3 are compatible with two schools of semantic theories. One is some version of Roothian semantics (Rooth 1985), which allows a semantic representation to be composed of the ordinary semantic dimension, deriving something like (46) and (48), and the alternative semantic dimension, deriving something like (47) and (49). Another is some version of Herburger’s (2000) semantic theory, which allows focus to directly reshape quantificational structures. In this theory, the representations in (46) and (48) would
be at intermediate stages, they would be reshaped into (47) and (49) by syntactic and/or semantic processes.

5.2 Focus-background partition with across-the-board obligatory defocusing movement

Not every theory of focus-sensitive adverbials allows the adverbials to freely merge with various sizes of clausal projections (VPs, bare vPs, vPs modified by various adjuncts, TPs, etc.). Sudhoff (2010) maintains the view that when focus-sensitive particles in German do not merge with non-clausal constituents, they can only merge with the topmost VP-shell excluding sentence adverbs (he assumes that there are no vPs and TPs in German), and this VP is mapped to the focus domain. In addition, all movable non-focused expressions that are based-merged inside the focus domain have to move out of the focus domain, as in (50). This movement is called the defocusing movement.

\[
(50) \quad [vP \text{ non-focused expression} \underbrace{VP \, PP \, \ldots \, \ldots \, V}]_\text{focus domain (topmost VP shell, excluding sentence advs.)}
\]

Under this account, the c-command condition effects and the closeness condition effects observed in Section 3 all involve fixed positions for quantificational adverbs and quantified DPs. In Mandarin Chinese, assuming that TP exists, focus-sensitive expressions would merge with a TP, the latter being the focus domain, and all non-focused expressions would be moved out of this domain, as in (51):

\[
(51) \quad [TP \text{ non-focused expression} \underbrace{\text{Qu}\overline{E} \, \ldots \, \ldots \, \overline{E}}]_\text{focus domain} \quad \text{(QuEs can be adverbs or quantified DPs)}
\]

In what follows, I will argue the present variable-adjunction-site approach compares favorably with this across-the-board defocusing movement approach.27

5.2.1 Empirical and theoretical issues of the defocusing movement approach

Such an account can apparently correctly describe the Mandarin facts in Section 3, but it makes several wrong empirical predictions, nor is it compatible with the main theories of movement and adverbial syntax.

27. Ernst (1994) and Ernst and Wang (1995), among others, also maintain the view that preposed objects in Mandarin can merge with VPs in without involving A'-movement of the subject. This view is compatible with my account of focus-sensitive expressions, and incompatible with the across-the-board defocusing movement account. My account differs from their works and other similar works in Mandarin in that the latter do not discuss the potential focus-sensitivity of the moved expressions.
First of all, a defocusing movement account wrongly predicts that all non-focused expressions have to move out of the focus domain. In all of the examples examined in Section 3, postverbal non-focused expressions are never required to move out of vP or TP. This is unexpected under the defocusing account.

Second, the defocusing account wrongly predicts that QuEs cannot follow presumably TP-internal expressions. This prediction is not borne out, because auxiliary adverbs such as hui can easily occur before quantificational adverbs like yizhi ‘always’, chang ‘often’:

(52) a. Lisi hui yizhi dang laoshi.
   L. will always be teacher
   ‘Lisi will always be a teacher.’
b. Lisi hui chang qu kan ni.
   L. will often go see you
   ‘Lisi will go visit you often.’

Third, the defocusing account does not seem to be theoretically appealing, since it does not offer a principled account of how focus-sensitive adverbs are licensed cross-linguistically. As we have seen in Example (1), quantificational adverbs in English have to follow the subject DP whether or not the latter is the bound focus. Additionally, English is a language where focusing adverbs are known to occur in positions that are obviously TP-internal: (a) when the whole sentence is focused, focusing adverbs is preferably in a post-subject, post-first auxiliary position, as in (53a,b); (b) when the subject is focused, some focusing adverbs can occur in a post-subject, post-first auxiliary position, as in (53c); (c) when a vP-internal expression is focused, focusing adverbs can occur after the first auxiliary, even when the focusing operator takes wide scope, as in (53d).

(53) a. ..and Harvard has even been holding pep rallies. (Anderson 1972)
b. There’s just nothing to do. (Huddleston and Pullum 2002:587)
c. [Anna]F could even escape from the prison. (Bayer 1999)
d. Notice that (6) could only mean [(b) ]F and could not mean (a). (Baltin and Collins 2001:4)

Under the defocusing movement account, the distributional facts of English quantificational adverbs and focusing adverbs would require a distinct licensing mechanism that does not involve defocusing movements. Furthermore, the account would have to claim that while languages like German and Mandarin only license the adverbs at TP/topmost VP-external positions, languages like English can license them in TP-internal positions. This adds unappealing complexity to the syntactic theory.
5.2.2 How the variable-adjunction-site/landing-site approach can resolve these issues

Under the account developed in § 4.2.1, which allows some freedom with regard to the clausal adjunction sites and landing sites, we have principled solutions to most of the above problems.

First of all, since there are no defocusing movements, except in limited cases when the subject is the bound focus and some vP-external expressions are not in focus (see note 10), there is no need for vP-internal non-focused expressions to move.

Second, the syntactic facts in (52) are a direct consequence of the fact that adverbial QuEs can merge with vPs as well as TPs.

Third, the syntactic facts in English such as (1) and (53) can be accounted for in a principled way by our approach. We now only need to allow languages to differ with regard to how specific details of adjunction and Agree works, without stipulating that the English and Mandarin have totally distinct mechanisms that license focusing adverbs. In sentences like (1), always stays in the post-subject position. Let us assume, based on the discussions in § 4.2.1, that the following parametric differences about some Q-adverbs hold:

(54) **English:** There are no verbal clitics available to render TP a licit adjunction site.

**Mandarin:** There are verbal clitics available to render TP a licit adjunction site.

Due to this parametric setting, English adopts the vP-adjunction option instead of the shi clitic-support option, thus the difference between (1a) and (3a) is accounted for by the variable-adjunction-site approach.

In sentences like (53), focusing adverbs occur in the post-subject, post-auxiliary verb position. Let us assume, following Shu (2011), that this is due to a different set of parametric settings: 28

(55) **English:** An auxiliary verb head can be an adjoined, right-adjunction to this head is allowed.

**Mandarin:** A auxiliary verb head cannot be adjoined.

Assuming that these directionality parameters and parameters about sizes of merging elements exist, our Agree-based variable-adjunction-site account can derive the English syntactic facts straightforwardly.

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28. It is commonly assumed that the auxiliary verb-adverb word order in English is the result of moving the auxiliary verb to T (Pollock 1989). However, such an analysis has difficulties explaining why the movement is possible even when the adverb takes wide scope over an epistemic modal, as in (53d).
6. A note on real defocusing movements

Our analysis, which does not assume defocusing movements in sentences like John only saw Mary (with Mary in focus), is still not able to account for some clear cases of defocusing movement effects such as the German Example (25a) and the Mandarin Example (23c), repeated below (with the defocused elements shaded).

(56) a. … weil Peter Maria, nur t₁ [küsste]ₚ.
    because P. M. only kissed
    ‘…because Peter only kissed Maria.’

    at night most DE task DOU SHI L. do
    ‘The people who do tasks at night are mostly Lisi.’

Although a comprehensive investigation is beyond the scope of the paper, I will provide some brief remarks on three theoretical questions:

(57) a. How are they licensed?
    b. Why are there no defocusing movements in English?
    c. Why do they only affect preverbal expressions in Mandarin?

To answer (57a), let us check if they behave like well-known cases of movements. It turns out that the defocusing movements in Mandarin do not behave like typical A and A'-movements in two aspects. First of all, they do not exhibit the same semantic effects as topicalization. This is so because the defocused elements can correspond to wh-questions in question-answer contexts, whereas topics cannot:

(58) A: Shenme shihou dabufen de gongzuo dou shi [Lisi]ₚ zuo?
    what time most DE work DOU SHI L. do
    ‘When is the time that the people who do tasks at night are mostly Lisi?’

B. Zai wanshang, [dabufen de gongzuo]₁ dou shi ta t₁ zuo t₁.
    at night most DE task DOU SHI he do
    ‘The people who do tasks at night are mostly him.’

(59) A: Lisi xihuan shei?
    L. like who
    ‘Who does Lisi like?’

B. #Zhangsan, Lisi xihuan t₁.
    Z. L. like
    ‘#Zhangsan, Lisi likes.’

Second, the defocusing movements can be mandatory, but only in a subset of environments where movements can take place. While the movement of the temporal adjunct is mandatory in (56b), it is not required when the defocused ele-
ment is in a postverbal position. As we have seen in (3), (4), and relevant examples discussed in Section 3, all non-focused elements in postverbal positions can stay there. This special syntactic condition on the extraction sites of movements is not found in typical A and A’-movements.

When we look at some less-typical movements, such as scrambling and PF-conditioned movements such as the ba-construction, we find similar state of affairs. Scrambling is known to have distinct interpretational effects from that of topicalization. Scrambling of unstressed pronouns, for examples, tend to be obligatory in German and Dutch (cf. Thráinsson 2001). This is not a property of topicalization, which target pronouns when required for some interpretational effects. Furthermore, it is known that some movements refer to PF factors. In Mandarin, for example, the ba-DP movement tend to be obligatory when the verb is followed by two or more constituents (Huang 1982; Li 1985, among others). In Scandinavian languages, the Holmberg’s Generalization effects have also been understood as PF conditions on movements (Richards 2004; Fox and Pesetsky 2005, among others). Japanese scrambling and English heavy NP shift have also been noted to be sensitive to PF factors (Saito and Fukui 1998). Based on these parallels, it seems plausible to assume that the defocusing movements in (56) are in the same natural class that contain scrambling and various types of PF-sensitive movements. They are, therefore, presumably licensed by optional EPP features, the latter of which are only present when a new outcome is licit and required, as per the general economy principle (cf. Fox 1995, 2000; Reinhart 1997; Chomsky 2001). This provides a preliminary answer to (57a). For concreteness, let us assume that the relevant outcome for defocusing movements is a condition on the syntax-semantic mapping with regard to the focus-background structure:

\[(60) \textit{Mapping Condition} \]

Avoid background materials in the focus domain.

In both examples of (56), if defocusing movements did not take place, there would be background materials in the focus domain (the elements following nur and dou, respectively), and the resultant structure would involve improper syntax-semantics mapping.\(^{29}\)

A consequence of treating the defocusing movement as scrambling-type movements is that they should all be subject to similar syntactic conditions that are not observed in other types of movement structures. One such property is the well-documented sensitiveness to head-directionality parameters (HDPs), which can be stated as follows (cf. Saito and Fukui 1998; Richards 2004, among others):

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\(^{29}\) This condition is distinct from the Mapping Hypothesis proposed in Diesing (1992) and elaborated in Drubig (2003), which does not involve contrastive focus constructions.
Movements associated with optional EPP features are regulated by head-directionality parameters at PF.

In German and Mandarin examples in (56), this is indeed what we see: the landing sites are preverbal, just as non-heads precede heads in these languages. (61) can thus explain (57b), namely the lack of defocusing movements in the English counterparts of (56a):

(62) a. John only [kissed]$_F$ Mary. (VO output)
b. *John Mary$_i$ only [kissed]$_F$ t$_i$. (OV output)
c. Mary, John only [kissed]$_F$ t$_i$. (OV output)

(acceptable but only with the topicalization interpretation)

Defocusing movement in English is not allowed, because leftward scrambling-type movement, without Scandinavian-type leftward verb movement, conflicts with its head-initial directionality setting at PF. Rightward defocusing movement is also not an option, since it is reserved for ‘heavy’ elements, according to Saito and Fukui’s (1998) analysis.

Similar reasoning can be used to explain (57c). Although the HDP setting is head-final with regard to the positions of temporal adjuncts in Mandarin, the setting for a number of VP-internal expressions, including the theme-arguments, is head-initial (Huang 1982; Koopman 1984; Travis 1984, among others). This means that if expressions that are specified as head-initial with regard to verbs move leftward, (61) is violated. This explains why postverbal elements do not undergo defocusing movements in Mandarin:

(63) a. Yizhi $\text{shi}~[\text{Mary}]_F$ $\text{dai}~\text{John}~\text{qu~kan~dianying}$. (=3a) (VO output)
   always $\text{SHI}~M$. $\text{take}~J~\text{go see movie}$
   ‘The person who takes John to the movies is always Mary.’
b. John$_i$, yizhi $\text{shi}~[\text{Mary}]_F$ $\text{dai}~t_i~\text{qu~kan~dianying}$. (OV output)
   J$_i$ always $\text{SHI}~M$. $\text{take}~J~\text{go see movie}$
   ‘John, the person who takes him to the movies is always Mary.’
   (Only the topicalization interpretation is available.)

If the analysis about defocusing movements in German and Mandarin in this section is on the right track, we have a principled account of the defocusing

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30. I follow Huang (1982) and assume that Mandarin VPs are general head-final except for the certain arguments selected by transitive verbs.

31. The $\text{ba}$ DP movement is a notable exception to this directionality setting on theme arguments, as moved theme argument is preverbal. This is due to a distinct PF constraint that bans two postverbal VP-level constituents (Huang 1982; Li 1985, among others).
movement phenomena, without postulating the more powerful and problematic across-the-board defocusing movement analysis as depicted in (51) (cf. § 5.2.2).

7. The focus-sensitivity of the lian…dou ‘even’ construction

So far, we have seen that quantificational expressions can be focus-sensitive, both in terms of interpretational effects and syntactic effects. A natural theoretical question to ask is how general this type of focus-sensitiveness is.

As it turns out, linguists have noted that typical focus-sensitive adverbs can also accommodate embedded contrastive focus (Vallduví 1990:172):

(64)  [John and Mary know the Amazon quite well, but…] only John's been to the [cities]F in Brazil.

In this example, although the familiar (semantic) focus associated with only is John, another expression, cities, is prosodically focused. Furthermore, in the context given, cities in Brazil are contrasted with other places in Brazil, where both John and Mary have been to. Since this example does not involve information focus, which typically occur in answer sentences to wh-questions, nor does it involve typical contrastive focus, which would involve overt movement or cleft constructions in English, it appears to form a natural class with examples in (1) and (2), which I argue to involve association with focus. This means that only may somehow associate with focus for a second time. Let us call this type of construction secondary focus binding construction, which is distinct from the typical multiple-focus-binding construction discussed in note 33. Its property can be informally stated as follows:

(65)  Defining property of secondary focus binding constructions

A focusing operator α may associate with a contrastive focus, in addition to the regular focus it associates with.

32. The example is also briefly discussed in Hoeksema and Zwarts (1991:67) and Wilkinson (1996:203). Wilkinson identifies this type of focus as contrastive focus.

33. This type of AwF configuration is distinct from the multiple-focus-binding configuration discussed in Bayer (1999), which involves multiple prosodic focus and multiple exclusive focus interpretation. Such a sentence would be felicitous in the following context, which is distinct from the one in (64):

(i)  [I don't know if Mary have been to the jungles in Brazil…] I only know that [John]F's been to the [cities]F in Brazil.
If the above analysis of sentences like (64) is on the right track, we expect that the descriptive generalization in (20) can be revised to cover scope-bearing constructions in general, which would include both quantificational expressions and typical focusing expressions, as in (66):

(66) Syntax-semantics correspondence of scope-bearing constructions
The focus-sensitiveness of scope-bearing expressions is reflected by overt structural differences in Mandarin Chinese.

In what follows, I will show that the prediction is borne out with the lian...dou construction in Mandarin, which is ideal for our purposes because (i) focused object DPs obligatorily moves; (ii) dou belongs to the type of non-movable adverbials that has to be as close to the focus as possible. I assume the zhi ‘only’ construction also follows the descriptive generalization (66) to some extent, but the relevant effects are difficult to pin down due to the lack of these two properties.

Consider the following Mandarin examples:\(^{34}\)

(67) a. [Whenever Lisi goes to Costco, he behaves like a shopaholic…]
L. at Costco even car dou buy
‘Costco stores are places where Lisi buys everything he sees, even a car.’\(^ {35} \)
(cannot be synonymous with (67b))

b. [Lisi is a very loyal Costco employee…]
L. even car dou at Costco buy
‘Lisi buys everything, even his cars, at Costco, instead of at other places.’
(cannot be synonymous with (67a))

The two examples are both even focus constructions, with qiche as the focus associated with lian ‘even’. Syntactically, they contrast minimally with respect to the position of the lian-marked phrase and the adverbial dou.\(^ {36} \) In (67a), the the lian…dou sequence follows the locative adjunct, whereas in (67b) the sequence precedes the locative adjunct. Semantically, the two sentences are also distinct, as indicated in the English paraphrases and the contexts provided. The presuppositions involved are also different. (67a) presupposes that it is more likely for one to

\(^{34}\) In both examples, the lian-phrase can move further to become a topic, but the adverbial dou has to stay in the positions indicated.

\(^{35}\) The contexts in (67) are only representative ones, there are other possibilities. What is crucial here is that embedded contrastive focus is involved and the two examples are semantically distinct.

\(^{36}\) In these examples, the expressions following dou are preferably not in prosodic focus. I am agnostic as to why this is the case.
buy other items than cars at Costco. (67b) also has this presupposition, but it additionally presupposes that it is more likely for one to buy cars at other stores, such as car retailers, than at Costco (hence the requirement of a 'loyal employee' context or something similar). Importantly, these facts show that in (67b), the locative adjunct zai Haoshiduo is an embedded contrastive focus, and the lian-phrase and the focus marker dou has to c-command this focus, and the adverbial dou has to be as close to the embedded contrastive focus as possible. (65) and (66) are thus borne out with the lian…dou construction, and the latter should be subject to similar syntactic analyses as QuEs discussed in Section 4.

8. Conclusion

This paper has examined the focus-sensitiveness of quantificational expressions and typical focus constructions in Mandarin to argue that the A′-dependency structure of these expressions, rather than simply involving movement of quantificational expressions to a scope-taking position, in fact involves a configuration that contains multiple Agree and feature inheritance. The more complicated structure is called for because the syntactic positions of quantifiers and focusing adverbs in Mandarin is contingent on the positions of the bound foci associated with the quantifiers and focusing adverbs.

In constructing this analysis, empirical arguments are presented for the view that quantifiers are focus-sensitive and focusing adverbs may associate with another contrastive focus for a second time. In English, the evidence comes from the prosody-semantic correspondence effects in quantificational constructions. In Mandarin, the evidence comes from syntax-semantic correspondence effects of focus-sensitivity. In addition to some relevant German facts, the previously undocumented facts of Mandarin show that the mainstream, purely pragmatic, approach to the English data is problematic. I have also compared the present account to the across-the-board defocusing movement account, and have shown that the present variable-merging-site-based account has better cross-linguistic coverage. I have also shown that while some cases of defocusing movement in Mandarin do exist, they are limited to cases where vP-external expressions are moved across quantified subject DPs and are regulated by principles involving scrambling-type movement structures.

One important consequence of the present analysis is that contrastive focus comes in various forms in terms of syntax and semantic representations. The typical kind of contrastive focus may not have any syntactic effects, and its typical use is corrective (i.e. John saw MARY, but not JANE). In this article, it is shown that certain types of contrastive focus are bound by other scope-bearing
operators, and they determine the syntactic positions of scope-bearing elements in languages like Mandarin (and, to some extent, German). Syntactic and semantic theories of contrastive focus need to be enriched correspondingly in order to accommodate the facts.

Allowing variable landing sites for a given type of movement distinguishes the present analysis from the familiar accounts of movement, but it is compatible with Chomsky’s (2004) and Miyagawa’s (2010) view that the purpose of Agree is to satisfy the duality of semantics, which involves discourse-related properties and scopal effects. What the current account proposes simply slightly amends this view so that feature inheritance can also satisfy duality of semantics. It thus follows that the landing site is variable, contingent on the choice of focus or extra focus.

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