

# The Semantic Difference Between Chinese *quan* and *dou*\*

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## 1 Introduction

This paper examines the semantic properties of *quan* and *dou* in Chinese, both of which are glossed as English 'all'. I argue that contrary to intuition, *dou* and *quan* in fact have different semantic functions. The difference between *quan* and *dou* is that *quan*, unlike *dou*, is not a distributor and its sole semantic function is to ensure that the value of a cover is a good fit in the sense of Brisson (1998). I'll show that this analysis accounts for a series of distributional differences between *quan* and *dou* and also distinguishes sentences with *quan* from those without it.

## 2 'All' in Mandarin Chinese

The basic facts about *quan* and *dou* in Chinese are presented in this section to set the stage for our further discussion. As shown in sentence (1) and (2), both *dou* and *quan* are glossed as 'all' and the meanings of both sentences are the same:

- (1)      tamen dou shuizhao le  
          they all asleep ASP  
          'They are all asleep.'
- (2)      tamen quan shuizhao le  
          they all asleep ASP  
          'They are all asleep.'

In addition to their meaning, *quan* and *dou* share the so-called Leftness Condition – the NP associated with *dou* and *quan* must be on their left. Although the unmarked word order in Chinese is SVO as shown in (3), when the ob-

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ject NP is associated with *dou* or *quan*, it has to be moved to a preverbal position to satisfy the Leftness Condition. This is illustrated in sentences (4) and (5).

- (3) wo kan-wan le naxie shu  
I read-finish ASP those book  
'I finished reading those books.'
- (4) a. naxie shu, wo dou kan-wan le  
those book, I all read-finish ASP  
'I finished reading all those books.'
- b. \*wo dou kan-wan le naxie shu  
I all read-finish ASP those book  
'I finished reading all those books.'
- (5) a. naxie shu, wo quan kan-wan le  
those book, I all read-finish ASP  
'I finished reading all those books.'
- b. \*wo quan kan-wan le naxie shu  
I all read-finish ASP those book  
'I finished reading all those books.'

Another property shared by *dou* and *quan* is that the NP associated with *dou* or *quan* doesn't have to be plural. Both *dou* and *quan* can 'quantify' over parts of a singular NP as in (6) and (7):

- (6) naben shu, wo dou kan-wan le  
that book, I all read-finish ASP  
'I finished reading all parts of that book.'
- (7) naben shu, wo quan kan-wan le  
that book, I all read-finish ASP  
'I finished reading all parts of that book.'

Despite these shared properties, the distribution of *dou* and that of *quan* are not the same. First, *quan*, unlike *dou*, cannot occur with *wh*-phrases. When a *wh*-NP appears to the left of *dou*, as in (8), the *wh*-NP is interpreted as a universal quantifier. *quan*, however, cannot turn a *wh*-word into a universal quantifier, as shown in (9).

(8) shei dou lai le  
 who all come ASP  
 'Everyone has come.'

(9) \*shei quan lai le  
 who all come ASP  
 'Everyone has come.'

Second, unlike *dou*, *quan* cannot occur in the focused *lian* 'even' construction. In the *lian* 'even' construction, '*lian*...*dou*' in (10) acts like a focus marker and yields a reading equivalent to English 'even'. As shown in (11), *quan* cannot appear in the *lian* 'even' construction.

(10) lian Zhangsan dou lai le  
 even Zhangsan all come ASP  
 'Even Zhangsan has come.'

(11) \*lian Zhangsan quan lai le  
 even Zhangsan all come ASP  
 'Even Zhangsan has come.'

Finally, *quan* and *dou* are not always interchangeable even in the distributive reading, as shown in (12) and (13). This seems puzzling if both *quan* and *dou* are 'all'. It contrasts with the previous examples (1) and (2), in which *dou* and *quan* are interchangeable.

(12) tamen dou mai le yi-bu chezi  
 they all buy ASP one-CL car  
 'They all bought a car.'

(13) \*tamen quan mai le yi-bu chezi  
 they all buy ASP one-CL car  
 'They all buy a car.'

In sum, while both *quan* and *dou* are glossed as 'all' and share some properties, they nonetheless have different distributions. The purpose of this paper is to provide a semantic account to explain these facts by examining the semantic properties of *quan*, which, to my knowledge, has not been discussed in the literature, unlike the much-discussed *dou*.

### 3 *Dou* as a Generalized Distributive-Operator

Lin (1996, 1998) has argued convincingly that *dou* is an overt generalized distributive-operator distributing over the members of a plurality cover in the sense of Schwarzschild (1996). In the generalized distributivity theory, the distributive-operator has a resource domain variable *Cover* that is context-dependent in its restriction. The formal definition of cover in Lin (1996, 1998) is the following:

- (14) i. C is a plurality cover of A iff C covers A and no proper subset of C covers A.  
 ii. C covers A if C is a set of subset of A.  
 Every member of A belongs to some set of C.  $\emptyset$  is not in C.

Evidence for analyzing *dou* as a generalized distributor with a domain variable comes from sentences that have the so-called subgroup reading such as the following (from Lin (1998)):

- (15) tamen dou shi fuqi  
 they all be husband and wife  
 'They are all husbands and wives (couples).'
- (16) Xiaoming, Dahua han Abao dou shi tongxue.  
 Xiaoming, Dahua, and Abao all be classmates  
 'Xiaoming, Dahua, and Abao are all classmates.'

Lin (1998) correctly pointed out that in (15), if *dou* were a distributor distributing down to the atomic members of the plural individuals denoted by the sentence noun phrase, the sentence would make no sense because no single individual is a husband and wife. What *dou* distributes over in sentence (15) are pairs of people who are couples. Therefore, the plurality cover for (15) would consist of cells of couples, i.e., { {Mr. and Mrs. A}, {Mr. and Mrs. B}, .....}. Sentence (16) has two readings. In the first reading, Xiaoming, Dahua, and Abao are all classmates in the same class. A plurality cover for this reading would consist of one cell, i.e., { {X,D,A} }. In the second reading, it does not require that the three persons all be in the same class. It could be that Xiaoming and Dahua are classmates, Dahua and Abao are classmates, and Xiaoming and Abao are classmates. In this reading, the plurality cover that can be defined from the plural subject consists of three cells, i.e., { {X,D}, {D,A}, {X,A} }. The choice of a particular cover relies on contextual information.

Lin (1996, 1998) has argued quite convincingly that Chinese *dou* is an overt generalized distributive-operator. The question now is whether *quan* is also a distributor like *dou*. In the next section, I argue that *quan* is not a distributor and has a different semantic function from *dou*.

### 3 The Semantic Function of *Quan*

Compare the following two sentences in English (from Brisson 1998):

- (17) The boys jumped in the lake.  
 (18) The boys all jumped in the lake.

The difference between sentence (17) and sentence (18) is that (18) is a stronger statement than (17). While (17) can be judged true if one or two of a large group of boys stayed on shore, (18) strictly requires that every boy jumped in the lake. In other words, sentences without *all* as in (17) tolerate exceptions to yield a 'non-maximality' reading, but sentences with *all* such as (18) must have a 'maximality' reading. That is, *all* eliminates the possibility of exceptions, and has a 'maximizing effect' on a sentence with a definite plural.

In Brisson (1998), the possibility of non-maximality readings of definite NPs is attributed to pragmatic weakening. She proposes that the 'maximizing' effect of *all* is essentially an 'anti-weakening' effect. The semantic contribution of *all* to sentences like (18) is to rule out the possibility of pragmatic weakening. Brisson (1998) adopts the generalized theory of distributivity (Schwarzschild 1996), and proposes that pragmatic weakening should be captured as just another type of domain selection effect by allowing for the possibility of what she calls 'ill-fitting' covers. Brisson (1998) suggests, following Schwarzschild (1996), that the value of the domain variable (i.e., *Cov*) of a distributor is a cover of the whole domain of discourse, which creates room for pragmatic weakening. To get the maximality reading, the resource domain variable of the distributor must be further restricted in such a way that only a 'good-fitting' cover can be assigned. The definition of a good-fitting cover in Brisson (1998) is the following:

- (19) Good-fitting cover
- i. Good fit is a relation between a cover and the set denoted by a definite NP.
  - ii. The cover is a good fit if there isn't any member of the set that is stuck in a cell with some non-member.

For example, sentence (18), repeated here as (20a), will be interpreted as (20b):

- (20) a. The boys all jumped in the lake.  
 b.  $\forall x[x \in [Cov_i] \ \& \ x \subseteq [\text{the.boys}']] \rightarrow x \in [\text{jump.in.the.lake}']$

$U = \{a, b, c, s, t, \{a, b\}, \{a, c\}, \dots\}$

$[\text{the.boys}'] = \{a, b, c\}$

$J = \{ \{a\}, \{b\}, \{c\}, \{s, t\} \}$

$K = \{ \{a\}, \{b\}, \{c, s, t\} \}$

$U$  represents the whole domain of discourse and the denotation of the NP 'the boys' is a set whose members are  $a$ ,  $b$ , and  $c$ .  $J$  and  $K$  are covers that can be assigned to  $Cov$ . According to the definition in (19),  $J$  is a good-fitting cover with respect to the denotation of 'the boys'.  $K$ , on the other hand, is not a good-fitting cover because one of the members of the set denoted by the NP 'the boys' is stuck in a cell with some non-boys, i.e.  $\{c, s, t\}$ . Now, if  $K$ , an 'ill-fitting' cover, is assigned to the value of domain variable  $Cov$ , the quantificational force of the distributor is weakened and the sentence would have a non-maximality reading. However, the existence of *all* in sentence (18) would ensure that only the good-fitting cover  $J$ , and not the ill-fitting cover  $K$ , is assigned to the value of  $Cov$ . Because the good-fitting cover  $J$  is assigned, there isn't a possibility of pragmatic weakening and hence sentence (18) must have a maximality reading. In summary, Brisson (1998) derives the pragmatic weakening from the notion of 'ill-fitting' covers. What *all* does is to ensure that the cover is a good fit.

The Chinese counterparts of sentences (17) and (18) reveal that *quan* has the same 'maximality' effect:

- (20) na chun nanhai tiao jin le hu li  
 that CL boy jump enter ASP lake in  
 'Those boys jumped in the lake.'
- (21) na chun nanhai quan tiao jin le hu li  
 that CL boy all jump enter ASP lake in  
 'Those boys all jumped in the lake.'

Just as their English counterparts, while sentence (21) allows a 'non-maximality' interpretation, sentence (22) strictly requires a 'maximality' reading. Therefore, I propose that the semantic function of *quan* in Chinese is exactly like Brisson's (1998) analysis of *all* in English. I argue that the

semantic function of *quan* is different from that of *dou*. Specifically, *quan* is not a distributor, unlike *dou*. The semantic contribution of *quan* is to rule out pragmatic weakening. That is, all *quan* does is ensure that a good-fitting cover is assigned to the value of domain variable of a distributor.

#### 4 Explaining the Distributional Differences

In this section I'll show how my analysis of *quan* explains the distributional differences between *quan* and *dou*. Now, one may wonder, if *quan* is not a distributor, why is it compatible with distributive readings, such as in (23a)?

- (23) a. tamen quan shuizhao le  
 they all asleep ASP  
 'They are all asleep.'
- b. tamen dou shuizhao le  
 they all asleep ASP  
 'They are all asleep.'
- c. tamen shuizhao le  
 they asleep ASP  
 'They are asleep.'

Note, however, *quan* is only compatible with some distributive readings. Recall that one distributional difference between *quan* and *dou* is that they are not always interchangeable in the distributive readings, as shown in (24).

- (24) a. \*tamen quan mai le yi-bu chezi  
 they all buy ASP one-CL car  
 'They all bought a car.'
- b. tamen dou mai le yi-bu chezi  
 they all buy ASP one-CL car  
 'They all bought a car.'
- c. tamen mai le yi-bu chezi  
 they buy ASP one-CL car  
 'They (as a group) bought a car.'

While both *quan* and *dou* are possible in (23), only *dou* but not *quan* can be used in (24). I suggest that the reason that *quan* can occur in a distributive

reading such as (23a) is because the lexical meaning of the predicate itself, such as 'be asleep', is inherently distributive. As shown in (23c), the sentence has the same (distributive) meaning without *quan* or the overt distributor *dou*. On the other hand, predicates such as 'buy a car' in (24) are ambiguous in the sense that they can have either a distributive or a collective meaning. To get a distributive meaning, the presence of the overt distributor *dou* is necessary as shown in (24b). Without *dou*, the sentence can only have a collective reading as shown in (24c). Interestingly, as shown in (24a), *quan* cannot appear here with the predicate 'buy a car'. The point here is that *quan* is compatible with predicates such as 'be asleep', 'jump in the lake', etc., because these predicates are inherently distributive. *Quan* is incapable of eliciting the distributive reading from ambiguous predicates like 'buy a car' because *quan* is not a distributor<sup>1</sup>.

The second difference between *quan* and *dou* is that *dou* can occur with a *wh*-phrase on its left to yield a universal interpretation of the *wh*-phrase, but *quan* cannot:

- (27) shei dou lai le  
 who all come ASP  
 'Everyone has come.'

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<sup>1</sup> That the presence of *quan* requires distributivity but cannot elicit distributivity follows from the current analysis. Since the semantic function of *quan* is to strengthen the domain of distribution by ensuring that the value of a cover is a good fit, it follows that *quan* depends on distributivity. This predicts that for ambiguous predicates, such as 'buy a car', *quan* should be able to occur with them once the predicates become unambiguously distributive. That is, sentence (25) should be grammatical:

- (25) tamen quan dou mai le yi-bu chezi  
 they all all buy ASP one-CL car  
 'They all bought a car.'

The prediction has been borne out. Once the ambiguous predicate becomes distributive because of the presence of the overt distributor *dou*, *quan* is able to appear there, as in (25). In the case of inherently distributive predicates, as shown in (26), the combination of *quan-dou* is also predicated to be grammatical:

- (26) tamen quan dou shuizhao le  
 they all all asleep ASP  
 'They are all asleep.'

However, the combination of *quan-dou* cannot license a *wh*-word nor can it occur in the *lian* 'even' construction. The question then is why the distribution of *quan-dou* in these cases patterns with *quan*. Unfortunately, I don't have an answer for this question at this point.



- (28) \**shei quan lai le*  
 who all come ASP  
 'Everyone has come.'

Lin (1996) argues that Wh...*dou* constructions are elliptical *wulun* 'no-matter' constructions in which *wulun* 'no matter' forms a generalized union over a set of sets of objects. What *dou* does here is to distribute the property of the predicate over the members in the union resulting in a universal interpretation of the wh-phrase. Cheng (1995) takes a different approach. She argues that because Chinese wh-phrases are variables that need to be bound by a legitimate operator, when a wh-phrase appears to the left of *dou*, *dou* becomes the binder of the wh-variable and contributes universal quantification to it. No matter which analysis one takes, *quan* cannot occur with the wh-phrase because it simply is not a distributor with the quantificational force. Therefore, it cannot license a wh-phrase under Cheng's (1995) approach. Or under Lin's (1996) analysis, *quan* cannot distribute over the set of sets of objects like *dou*.

Finally, as shown in (29) and (30), while *dou* can occur in the focused *lian* 'even' construction, *quan* cannot.

- (29) *lian Zhangsan \*(dou) lai meishuguan le*  
 even Zhangsan all come museum ASP  
 'Even Zhangsan came to the museum.'
- (30) \**lian Zhangsan quan lai meishuguan le*  
 even Zhangsan all come museum ASP  
 'Even Zhangsan came to the museum.'

Suppose we consider three relevant individuals, i.e., Lisi, Wangwu, and Zhangsan, on a scale of the probability that they went to the museum, and Zhangsan is the least likely person to go to the museum. The implicature of sentence (29) is such that since even Zhangsan, the least likely person in the relevant, came to the museum, then it must be the case that all the other people in the relevant set who were more likely than Zhangsan to come to the museum came to the museum. That is, for sentence (29) to be true, we have to verify that 'Lisi came to the museum' is true, 'Wongwu came to the museum' is true and 'Zhangsan came to the museum' is true. Wu (1999) suggests that *dou* here distributes the property of the predicate over the members of Rooth's alternative P-set, namely, {Lisi, Wongwu, Zhangsan}, which is invoked by the focused on Zhangsan marked by *lian* 'even'. As shown in (29), *dou* is obligatory here and cannot be omitted. The sentence would be-

come uninterpretable without *dou* to distribute over the P-set<sup>2</sup>. That *quan* is not compatible with the *lian* 'even' construction, as shown in (30), follows directly from the claim that *quan* is not a distributor. Since it is not a distributor, it cannot distribute the property of the predicate over the members of the P-set to yield the focused meaning. In other words, *quan* cannot occur here for the same reason that *dou* cannot be omitted, namely, the fact that the *lian* 'even' construction requires a distributor.

In sum, the distributional differences between *quan* and *dou* all result from the same reason: *quan* simply cannot do what *dou* does, namely, distribute. The sole semantic function of *quan* is to ensure that the value of the domain variable of the distributor is a good-fitting cover. It follows that *quan* can only be present when there is a distributor.

## 5 Conclusion

I have shown that the analysis given here accounts for a series of distributional differences between *quan* and *dou* and also distinguishes sentences with *quan* from those without it, namely, the effect of maximality. Before concluding the paper, I'd like to discuss some implications of the current analysis.

It has been suggested that the Leftness Condition imposed by *dou*, i.e., the requirement that the NP associated with *dou* must be on its left, is a feature driven movement. The idea is that the overt distributor *dou* heads a functional category Distributive Phrase (Lin (1996, 1998), Li (1992), Li (1997) among others) and attracts the associated NP to the specifier position of DistP to check its feature via spec-head agreement. If this analysis is correct, then the fact that *quan* has the same requirement suggests that there must be a phonologically null distributor heading the DistP. Recall that *quan* is only compatible with predicates that are inherently distributive. What this means is that the Leftness Condition imposed by *quan* on the surface is in

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<sup>2</sup> Note that while *dou* is compatible with focused marker *lian* 'even', *dou* is incompatible with focused marker *zhiyou* 'only':

(31) \**zhiyou* *Zhangsan dou lai meishuguan le*  
 only *Zhangsan* all come museum ASP  
 'Only *Zhangsan* came to the museum.'

Wu (1999) suggests that this is because although *zhiyou* 'only' like *lian* 'even' invokes an alternative P-set, unlike *lian* 'even', it requires the predicate be true of no member in the alternative P-set except the one that is being focused. However, *dou* as a distributor must distribute the property of a predicate over every member of the set. The semantics of *dou* conflicts with that of *zhiyou* 'only'; hence, they are incompatible.

fact due to the existence of the null distributor associated with inherently distributive predicates, which also requires the associated NP to move to the specifier of DistP. Note, however, this approach seems to cloud the notion of feature strength in the theory, under the assumption that phonologically overt elements have strong features that trigger overt movement at syntax and phonologically null elements have weak features that only require covert movement at LF. Moreover, if the notion of feature strength cannot distinguish the overt distributor *dou* from the phonologically null distributor, what properties distinguish them? Why is it that only the overt distributor *dou* but not the null distributor can license wh-words or appear in the focused *lian* 'even' construction? I'll leave these issues to future research.

I have argued in this paper that *quan*, unlike *dou*, is not a distributive-operator, contrary to the initial impression it might give. The sole semantic function of *quan* is to ensure the value of a cover is a good fit. *quan* thus constitutes additional empirical evidence for Brisson's (1998) notion of good fit in the theory of distributivity.

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