

# A SQUIB ON THE BEHAVIOR AND SCOPE OF THE CHINESE ADVERBIAL QUANTIFIER “DOU”

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My analysis is divided into three broad sections. In the first, I undertake a brief descriptive analysis of the distribution of “dou.” From this analysis, it is clear that because of its syntactic position “dou” is an *adverbial quantifier*, even though in translation it may appear at times to be a nominal quantifier. In the second section, I outline the government and binding relationships that obtain for “dou,” showing how its peculiar requirement for indexing to a preceding pluraly determined or mass NP may be explained. In the third section, I turn to a discussion of the quantificational scope of “dou” in LF.

## DESCRIPTIVE ANALYSIS

The adverb “dou” is unique among adverbs in Mandarin in that it must refer to a preceding NP. For example:

- (1) hong-de hua wo dou xihuan  
red - ASSOC flowers I all like  
Red flowers, I like (all kinds).
- (2) nei-xie hai-zi wo dou xihuan  
those child I all like  
Those children, I like all of them.
- (3) yu, xia, xie, wo dou xihuan  
fish, shrimp, crab, I all like  
Fish, shrimp, crab—I like all of them.

Note that the NP to which “dou” refers must contain a mass noun as in (1), a pluralized NP modified by a demonstrative determiner as in (2), or a compound NP as in (3). Note also that the NP may occur in either topic or subject position:

- (1b) wo hong-de hua dou xihuan  
I red - DE flower all like  
I like red flowers.
- (2b) wo nei-xie hai-zi dou xihuan  
I those child all like  
I like all those children.
- (3b) wo yu, xia, xie, dou xihuan  
I fish, shrimp, crab, all like  
I like fish, shrimp, and crab.

In cases where both the topic and the subject are plural, multiple interpretations are possible. For example, sentence (4) may equally mean one of three things as indicated in (5a-c):

- (4) nei-xie hai-zi women dou xihuan  
those child we all like

- (5a) We like all those children.  
We all like those children.  
We all like all those children.

The position of “dou” itself is rigidly constrained with respect to the subject NP and the verb as demonstrated in the following examples:

- (6a) nei-xie hai-zi wo dou xihuan  
 those child I all like  
 Those children, I like them all.
- (6b) \*dou nei-xie hai-zi wo xihuan
- (6c) \*nei-xie dou hai-zi wo xihuan
- (6d) \*nei-xie hai-zi dou wo xihuan
- (6e) \*nei-xie hai-zi wo xihuan dou

The canonical position of “dou” is between the subject and the verb. This raises the question as to which node “dou” is attached. Because of its rigid preverbal position and its traditional classification as an adverb, it would seem that the most likely node for attachment of “dou” is in the specifier of VP. However, its interaction with the negative particle “bu” shows this to be implausible, favoring instead the view that it must be attached instead within I' or elsewhere within IP:

- (7a) \*<sub>CP</sub> [<sub>NP</sub> nei-xie hai-zi] [<sub>IP</sub> [<sub>NP</sub> wo] [<sub>I'</sub> bu [<sub>VP</sub> dou xihuan]]]]  
 those child I NEG all like
- (7b) [<sub>CP</sub> [<sub>NP</sub> nei-xie hai-zi] [<sub>IP</sub> [<sub>NP</sub> wo] [<sub>I'</sub>? dou bu [<sub>VP</sub> xihuan]]]]]  
 those child I all NEG like

To recapitulate, “dou” is strictly preverbal, attaching itself within IP. Structurally, it may be defined as an adverb, while semantically it behaves like a quantifier. Thus, it is best described as an *adverbial* quantifier.

## GOVERNMENT AND BINDING

The question that must be raised at this point is how is it that a verb modifier is in a position to *require* a nominal constituent? Of course, it would be simple enough to say that the lexical entry for “dou” specifies the presence of a certain kind of NP, but this does not go very far in explaining exactly what must be specified and how that specification sanctions the relationship of “dou” to an NP. Even more difficult to explain is how the presence of “dou” requires the presence of a compatible *preceding* NP as in (8a):

- (8a) nei-xie shu wo dou mai le  
 those book I all buy ASP  
 Those books, I bought them all.

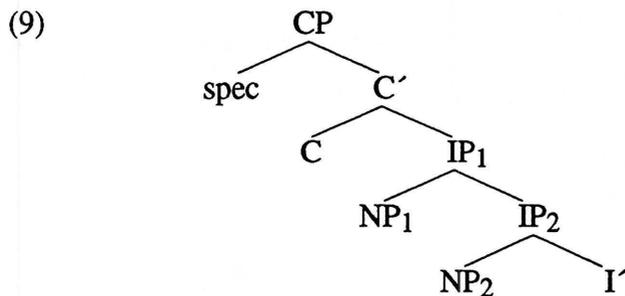
This pattern of behavior is even more puzzling when we consider that it is the presence of “dou” in a sentence that disallows an otherwise grammatical positioning of the plural NP after the verb. For example, compare (8b) with (8c):

- (8b) wo mai le nei-xie shu  
I buy ASP those book  
I bought those books.
- (8c) \*wo dou mai le nei-xie shu  
\*I all buy ASP those book  
I bought all those books.

Because of the similarity in meaning between sentences (8b) and (8a), it has been argued in the past that phrases such as "nei-xie shu" were "topicalized" through movement from a D-structure object position, and that the remaining empty category was variable bound. This interpretation runs into a problem however, in trying to account for the grammaticality of (8a), but ungrammaticality of (8c), since under this interpretation, the D-structure of both (8a) and (8c) would be identical, with the plural NP being base-generated within VP. Assuming topicalization, the S-structure of (8a) would be:

- (8d) nei-xie shu<sub>i</sub> wo dou [<sub>VP</sub> mai le t<sub>i</sub> ]  
those book I all buy PFV  
I bought all those books.

This type of analysis is problematic not only in Chinese (cf. Xu & Langendoen, 1985), but also in English (Haegeman, 1994). Instead, it could be assumed that topics are the result of left dislocation, in which the phrase is base-generated as an adjunct (cf. Haegeman, 1994) resulting in the following structure:



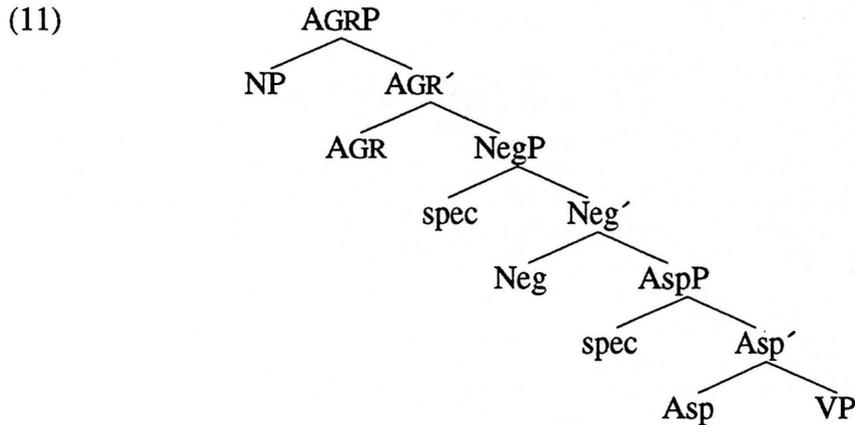
This assumption is quite important as will become clear later, but first we need to examine more closely the internal structure of IP in Mandarin and find an appropriate position for "dou."

Following the Split-INFL Hypothesis of Pollack (1989, cited in Haegeman 1994), we could hypothesize that INFL in Chinese is also divided into multiple levels. One piece of evidence for this notion comes from structures like that in (7b) where positions for both an adverb and a negative must be found. Note also that additional phrases or auxiliary verbs may intervene between subject and matrix verb as in (10) below:

- (10a) [<sub>CP</sub> [<sub>NP</sub> nei-xie cai] [<sub>IP</sub> [<sub>NP</sub> women] dou bu yao [<sub>CP</sub> chi le]]]  
those vegetables we all NEG want eat PFV  
'We all don't want to eat those vegetables'
- (10b) [<sub>CP</sub> [<sub>NP</sub> nei-xie cai] [<sub>IP</sub> [<sub>NP</sub> women] dou bu yao ba ta [<sub>CP</sub> chi-diao le]]]  
those vegetables we all NEG want BA 3sg eat missing PFV  
'We all don't want to take those vegetables and eat them up'

Even though under minimality it could be argued that aspectual markers would be base-generated post-verbally, there still must be some landing site provided for abstract feature checking in LF.

This evidence urges the adoption of a split-INFL treatment for Chinese. Since the exact number and type of nodes in Chinese INFL is not especially important for my discussion of “dou,” I have simply adopted the split-INFL structure presented by Haegeman (except that the Tense Phrase in Haegeman is substituted here by Aspect Phrase since Chinese does not have tense, but does have aspect):



Normally, inflectional features of functional heads are hosted by their maximal projection. In English, functional features of VP AGR are [ $\pm$ tense,  $\pm$ number]. As pointed out above, Chinese does not have tense, but perhaps it could be argued, using “dou” as evidence, that it does have number. First, we assume that [+number] is specified in the lexicon as a feature of “dou.” Next, we would hypothesize that “dou” appears under AGR, since this places it between the subject NP and the V, but before Neg (see example sentence 10a). The requirement then for a preceding plural (or mass) NP could be accounted for as a matter of specifier-head agreement. This would explain the grammaticality of (12a), and the ungrammaticality of (12b):

(12a) nei-ge hai-zi women dou xihuan  
 that child we all like  
 We all like that child.

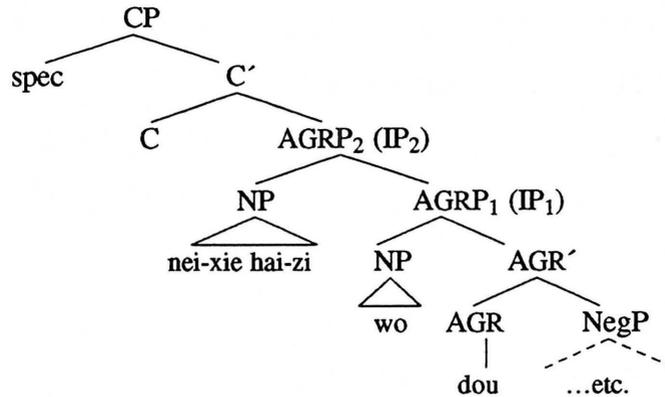
(12b) \*nei-ge hai-zi wo dou xihuan  
 \*that child I all like  
 We all like that child.

In (12a), the plural subject NP under the specifier of AGRP must agree with “dou,” which is the head of AGRP. In (12b) the singular NP subject “wo” does not agree with “dou.” However, this interpretation alone does not fully explain the ungrammaticality of sentences like (12b), on the one hand, and the grammaticality of sentences like (2), reproduced below as (13), on the other hand:

(13) nei-xie hai-zi wo dou xihuan  
 those child I all like  
 Those children, I like all of them.

In this case, specifier-head agreement between the AGR and the subject NP is violated just as it is in (12b). It is at this point that the importance of assuming that topics are base-generated left dislocations becomes apparent. Notice that under this interpretation the adjoined topic phrase m-commands AGR:

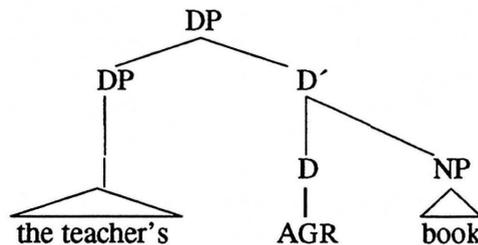
(14)



Thus if we assume that "dou" has abstract number and that it attaches to AGR, we are able to invoke the notion of number agreement in order to explain in principle why "dou" requires the presence of a preceding, plural NP.

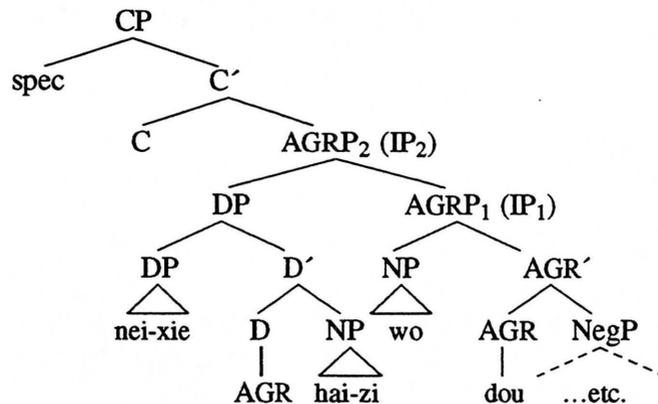
This argument may be further refined by adopting Abney's DP Hypothesis (cited in Haegeman, 1994). Abney proposes that in the same way that clauses may be viewed as projections of V dominated by functional projections such as AGRP and TP, NPs may be viewed as projections of N which are dominated by a functional head. The nominative marking of possessor phrases (e.g., my hat, your hat) in Hungarian and the genitive marking of such phrases in Turkish provide overt evidence for a nominal AGRP. Abney shows how English also provides non-overt evidence for an abstract nominal AGR, proposing the base-generation of structures like that in (15) where nominal AGR assigns genitive case to the phrase in the specifier of DP:

(15)



At this point I would like to propose that Chinese NPs, similarly to English NPs, also contain an abstract nominal AGR, the operation of which becomes apparent in the requirement that "dou" be preceded by a plural NP. Thus when we adopt the DP Hypothesis, it becomes clear that the *specific* mechanism which motivates this requirement is DPAGR-VPAGR agreement. The relationship between the nominal and verbal AGRs in (13) may be illustrated as below in (16):

(16)



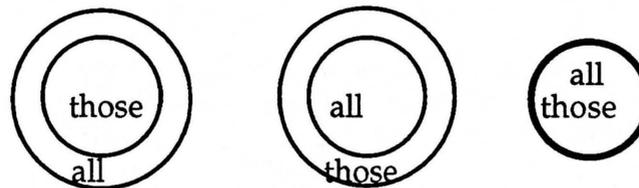
The real importance of adopting the DP Hypothesis however, is in the consequences this has for interpreting scope relationships. This is the topic taken up in the next section.

### INTERPRETING SCOPE IN LF

How do we interpret the scope relationships of a sentence like (13) which is reproduced below?

- (13) nei-xie hai-zi wo dou xihuan  
 those child I all like  
 Those children, I like all of them.

In this case the interpretation of quantity for “dou” (all) is dependent on the quantity specified by the determiner “nei-xie” (those). This can be easily illustrated with Venn diagrams:



The set referred to by “all” can neither be larger nor smaller than the set referred to by “those” as illustrated in the first two diagrams. In the first case, “dou” would mean ‘all and then some’; in the second case, “dou” would mean ‘partially all’. The third diagram shows the proper relationship between “those” and “all.” Thus, in sentence (13), “dou” has narrow scope and “nei-xie hai-zi” has wide scope, since the interpretation of “dou” is dependent on the prior interpretation of the scope of “nei-xie hai-zi.” But how can this scope relationship be accounted for in LF?

According to Haegeman (1994), a quantifier’s scope at LF is determined by “the maximal projection which dominates it” (p. 536). Chomsky defines dominance as:

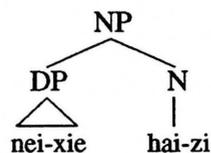
**Dominance:**

A is dominated by B only if A is dominated by every segment of B.

The tree structure for (16) reveals that “dou” is dominated by IP. The same is not true for the DP. Dominance requires domination by *every* segment of the maximal projection. The DP is dominated only by IP<sub>2</sub> and not by the base maximal projection, IP<sub>1</sub>. In Haegeman’s terms, it is “on the balcony.” The DP is instead dominated by CP. Since CP is higher in the structure than IP, the DP has scope over “dou.”

Notice that this interpretation is valid only if we assume Abney’s DP Hypothesis, that NP is a projection of N which is dominated by a functional category, AGR. If we were to make the traditional assumption instead that NP is dominated by N, the structure of the topic phrase would be:

(17)



If this were the case, then “those” would be dominated by the NP and hence present an uninterpretable scope interaction with “dou.” This can be demonstrated by replacing “nei-xie hai-zi” with the pronoun “tamen,” rendering the sentence ungrammatical:

- (18) \*tamen wo dou xihuan  
 \*they I all like  
 \*Them, I like all (of them).

This same argument however, appears at first to pose a problem for the proper interpretation of the sentence when the subject, not the topic, is pluralized:

- (19) nei-ge hai-zi women dou xihuan  
 that child we all like  
 We all like that child.

The plural "women" is dominated by NP<sub>2</sub>. If the previous argument were applied to this case, then the sentence should be uninterpretable. However, the sentence is grammatical because of specifier-head agreement between AGR and the NP.

### CLOSING REMARKS

One final issue of great interest deserves notice. Consider sentences (20a & b):

- (20a) nei-xie hai-zi wo xihuan tamen  
 those child I like them  
 Those children, I like them.
- (20b) nei-ge hai-zi women xihuan ta  
 that child we like 3sg  
 That child, we like him/her.

In both cases, the post-verbal pronoun is coindexed to the topic. Notice however, the apparent effect which the insertion of "dou" has on plural, but not singular object pronouns as in (20c & d):

- (20c) \*nei-xie hai-zi wo dou xihuan tamen  
 \*those child I all like them  
 \*Those children, I like all them.
- (20d) nei-ge hai-zi women dou xihuan ta  
 that child we all like 3sg  
 That child, we all like him/her.

In (20c), the binding of the plural pronoun "tamen" to the topic phrase appears to be blocked somehow by the presence of "dou." On the other hand, in (20d), "dou" agrees with the plural subject "women," allowing the singular pronoun "ta" to be bound to the topic. This is yet another example of the peculiarity of "dou"; a full explanation for this phenomena will have to be left however, for another time.

To conclude, in this brief paper I have attempted to describe in part the behavior of the Chinese adverbial quantifier "dou" and to give a syntactic analysis of its appearance in ordinary sentences. I demonstrated through this analysis that in order to understand its strict preverbal positioning as well as its relationship to either a plural topic or subject NP, we must assume left-dislocation of topic phrases as well as adopt the Split-INFL and DP Hypotheses, as these assumptions allow for the proper governance relations which lead to specifier-head and nominal-verbal AGR agreement. Moreover, I demonstrated how the DP Hypothesis is actually necessary for the proper interpretation of this quantifier's scope relationships. Finally, I indicated an additional, peculiar effect which "dou" has on sentence construction. Clearly, the work on understanding "dou" has only just begun; yet even at this early stage, there appears to be great

