Modals as Verbs in Chinese: A GB Perspective

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Chinese, like many other languages, has a set of words called modals which indicate the speaker’s attitude toward the proposition expressed by the sentence. This set of words has been acknowledged to express two types of modality, i.e., epistemic modality and deontic modality. Epistemic modality is the modality which makes judgments about the possibility or necessity of propositions; deontic modality is the modality which indicates permission, obligation, ability or disposition. According to this distinction, modals like yinggai ‘should’, keyi ‘may’ and hui ‘will, can’ may indicate either the epistemic modality or the deontic modality. Modals like keneng ‘possible’ can only express the epistemic modality and those like gan ‘dare’ and ken ‘willing’ can only express the deontic modality. In this paper, we will discuss some of intriguing issues about the syntax of modals within the framework of Government and Binding. It will be argued that Chinese modals, whether interpreted as epistemic or deontic, should head a VP projection and are primary predicates of the clause. In addition, Chinese modals can be divided into two types, i.e., raising modals and control modals. Three pieces of evidence will be given to support this classification. In our raising analysis of Chinese modals, it will also be suggested that in Chinese CP may be transparent for the ECP.

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Introduction

Chinese, just like many other languages, has a set of words called modals which indicate the speaker's attitude toward the proposition expressed by the sentence.¹

(1) a. keneng ‘possible’, etc.
   b. yinggai ‘should’, keyi ‘may’, hui ‘will, can’, etc.

This set of words has been acknowledged by linguists to express two types of modality, i.e., epistemic modality and deontic modality (cf. Lyons (1977), Palmer (1979, 1986)). Epistemic modality is the modality which makes judgments about the possibility or necessity of propositions; deontic modality is the modality which indicates permission, obligation, ability or disposition. According to this distinction, of the modals in (1), yinggai ‘should’, keyi ‘may’ and hui ‘will, can’ may indicate either the epistemic modality or the deontic modality, keneng ‘possible’ can only express the epistemic modality and the other modals in (1c) can only express the deontic modality.

In addition to the different types of modality that the modals in (1) express, there are a number of intriguing issues concerning the syntax of modals. In this paper, we will discuss some of these issues within the framework of Government and Binding. In section 1, it will be argued that Chinese modals, whether interpreted as epistemic or deontic, should head a VP projection and are primary predicates of the clause. Section 2, then, goes

¹ For different definitions of modals, see Lyons (1977) and Palmer (1979, 1986). The set of modals in (1) can be found in Tang (1979) and other works dealing with Chinese modals.
on to show that Chinese modals can be divided into two types, i.e., raising modals and control modals. Section 3 gives three pieces of evidence to support this classification. Section 4 discusses two further issues about the raising analysis of Chinese modals. One is related to the ECP, and the other to Case and empty expletives. Finally, we conclude this article, sketching two additional consequences of the proposed analysis.

1. Modals as Independent Predicates

1.1. Chomsky’s Analyses of Modals

It is well-known that each sentence (clause) in English may at most contain one modal verb (can, could, will, would, shall, should, may, might, etc.) and it always precedes the auxiliaries have and be. To account for this, Chomsky (1957) proposed a special node AUX to generate modals in English, and assumed that only one modal can be inserted under this node. In the same spirit, Chomsky (1981, 1986) assumes that modals are generated under INFL, together with Tense and Agr, as in (2).

(2)    I'
      /    \   
     I VP   
      / \   
   Modals [+/-Tense; +/-Agr]

According to Chomsky’s conception, (2) is a mono-clausal structure in which the verb under the node V is the main verb of the sentence. In this section, in contrast to Chomsky’s analysis of English modals, we propose that Chinese modals are not constituents of INFL, but are main predicates that determine the argument structure of the sentence.²

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2 Ross (1969), Gazdar et al. (1982), Falk (1984) and Pulhum and Wilson (1977) also argued that English modals should be analyzed as main verbs, contrary to Chomsky’s analysis.
1.2. Arguments for Modals as Independent Predicates

1.2.1. Sentence-final Modals

Generally, Chinese sentences containing modals, just like those in English, take the pattern subject-modal-VP, as illustrated below.

(3) a. You should do it this way.
    b. You may not analyze it this way.

(4) a. ni yinggai zheyang zuo
     you should this-way do
     You should do it this way.
    b. wo ke-bu-keyi zheyang fenxi
     I may-not-may this-way analyze
     May I analyze it this way?

It seems possible then that modals in Chinese are elements of INFL taking a VP complement as Chomsky analyzes English modals. The parallelism does not seem to be so straightforward, however. Apart from the pattern in (4), Chinese modals allow another pattern with the modal occurring at the end of the sentence, as in (5).

(5) a. ni zheyang zuo (bu) yinggai
     you this-way do not should
     For you to do it this way is (un)acceptable.
    b. wo zheyang fenxi ke-bu-keyi
     I this-way analyze may-not-may
     May I analyze it this way?

Sentences like those in (5) are often heard in daily conversations and are contrasted with their English counterparts (6).

(6) a. *You do it this way should (not).
    b. *You analyze it this way may (not).
Crucially, the contrast between (5) and (6) poses a problem for analyzing Chinese modals as elements of INFL. First consider the case of (6). On the assumption that modals are constituents of INFL and that functional categories take complements to their right in English, (6a) and (6b) are correctly predicted to be ill-formed, because the VP complements in (6) occur to the left of the modal. Now consider (5). Given that yinggai 'should' and keyi 'may' may occur in either the pre-VP position as in (4) or the post-VP position as in (5), no matter which direction we assume that INFL takes its complement in Chinese, either (4) or (5) would be incorrectly ruled out. This suggests that modals in Chinese might not be constituents of INFL; otherwise it would be puzzling why (5a) and (5b) are not ruled out as an analogue to (6a) and (6b).

If Chinese modals are not constituents of INFL, then where are they generated? We suggest that they are matrix predicates that project their own thematic arguments. To put aside the pre-VP modals for the moment, in particular, we propose that the post-VP modals in (5) are matrix predicates taking sentential subjects as their arguments. This analysis is supported by the fact that the sentence-final modals in (5) can be negated by the negative bu and form A-not-A questions, both of which are typical properties of verbs in Chinese.

The distribution of sentence adverbs supports this analysis. Sentence adverbs in Chinese generally occur either sentence-initially or after the subject but not in other positions, as illustrated below.

(7) a. xianran ta hen bu gaoxing
    obviously he very not happy
    Obviously he is not happy.
b. ta xianran hen bu gaoxing
   He obviously is not happy.
c. *ta hen bu gaoxing xianran
   He is not happy, obviously.

Now consider the distribution of sentence adverbs with respect to the construction (5).

(8) a. xianran ni zheyang zuo bu yinggai
       obviously you this-way do not should
       Obviously, that you did it this way is not acceptable.

b. ni zheyang zuo xianran bu yinggai
   That you did it this way obviously is not acceptable.

  c. *ni xianran zheyang zuo bu yinggai
     Obviously that you did it this way is not acceptable.

The examples in (8) show that the sentence adverb xianran ‘obviously’ can
be placed either sentence-initially or between ni zheyang zuo ‘you do it this
way’ and bu yinggai ‘should not’ but can not be placed between the subject
ni ‘you’ and zheyang zuo ‘do it this way’. This indicates that the major
constituents in (8) are ni zheyang zuo ‘you do it this way’ and bu yinggai
‘should not’ rather than ni ‘you’ and zheyang zuo bu yinggai ‘should not do
it this way’. The ungrammaticality of (8c), on the other hand, indicates that
the subject ni ‘you’ is not the root subject. All these facts follow straight-
forwardly, if ni zheyang zuo ‘you do it this way’ is a sentential subject and
bu yinggai ‘should not’ is the matrix predicate, as we propose.

A second argument in support of the claim that sentence-final (= post-
VP) modals should be analyzed as matrix predicates is related to the fact
that they may appear in comparatives, functioning as the scale/dimension of
comparison, as (9) demonstrates.
(9) ni zheyang zuo bi ta nayang zuo geng bu yinggai
you this-way do than he that-way do more not should
(lit.) For you to do it this way is more unacceptable than for him
to do it that way.

(9) suggests that the strings ni zheyang zuo ‘you do it this way’ and ta
nayang zuo ‘he does it that way’ are constituents, since in comparatives the
two compared things generally make up a syntactic constituent. The
comparative (9) also indicates that the scale/dimension of comparison bu
yinggai ‘should not’ is the main predicate of the sentence, since the scale/
dimension of comparison is always the main predicate of the sentence in
Chinese. In other words, the sentence structure of examples like (5) should
be analyzed as something like (10).

(10) [ni zheyang zuo] [bu yinggai]
The best analysis of (10), of course, is that the string ni zheyang zuo ‘you
do this this way’ is a sentential subject and bu yinggai ‘should not’ the main

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3 A reviewer pointed out that it is not always true that two compared things are
constituents in Chinese comparatives, as illustrated by the example below.
(i) ta jintian bi ni zuotian zao dao
he today comparatively you yesterday early arrive
Today he arrives earlier than you did yesterday.

Given examples like (i), it seems that one cannot conclude that the two
compared things in (9) are constituents. However, there is reason to believe that
the string ni zheyang zuo ‘you did it this way’ in (9) is a syntactic constituent.
Consider (ii).

(ii) [ni zheyang zuo], Zhangsan shuo ti bi ta nayang zuo geng bu yinggai
‘you this-way do Zhangsan say than be that-way do more not should
(lit.) For you to do this way, Zhangsan says is more unacceptable than for
him to do that way.

It is a standard assumption that only syntactic constituents can be moved. In (ii),
since the string ni zheyang zuo can be topicalized, this indicates that it is a
syntactic constituent.
verb of the sentence. 4

The final argument in support of the matrix-predicate analysis of sentence-final modals can be formulated in relation to the property of islands. Huang (1982) has pointed out that the interrogative reason adverb weisheme 'why' and A-not-A operators may not occur in islands like sentential subjects or complex NPs, as the following examples demonstrate.

(11) *ni weisheme lai bijiao hao
    you why come more good
    What is the reason x such that for you to come for x is better?

(12) *ni lai-bu-lai bijiao hao
    you come-not-come more good
    (lit.) Is it better for you [to come or not to come]?

Interestingly, we find exactly the same pattern in constructions with sentence-final modals, as we can see from (13) and (14).

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4 The fact that the modal yinggai may appear in comparatives also implies that it might be an adjective, since generally only adjectives are gradable. The adjectiveness of the modal in question is further confirmed by the fact that it can be modified by degree adverbs like hen 'very' or tai 'too'.

(i) a. ni zheyang zuo bu tai yinggai
    you this-way do not too should
    For you to do it this way is not very acceptable.

b. ni zheyang zuo hen bu yinggai
    you this-way do very not should
    For you to do it this way is very unacceptable.

Given that the ability to be modified by degree adverbs is the major criterion differentiating verbs from adjectives in Chinese (cf. Tang (1979)), (i) strengthens the possibility that the modal yinggai 'should' might be an adjective. If the modal yinggai is really an adjective, then this constitutes a piece of evidence that it is not a constituent of INFL, but the main predicate of the sentence. Note also that not only the modal yinggai 'should' but other modals such as hui 'be able to' may be modified by degree adverbs and appear in comparative constructions.
(13) *ni weisheme zheyang zuo bu yingga
you why this-way do not should
What is the reason x such that for you to do it for x is
unacceptable?
(14) *xiaohei zi chou-bu-chouyan bu yingga?
children smoke-not-smoke not should
(lit.) Are children supposed [to smoke or not to smoke]?

How can we account for the fact that (13) and (14) show the same
island-sensitivity as (11) and (12) discussed by Huang (1982) and Lin
(1992), among others? The obvious answer is that the phrases ni zheyang
zuo 'you do it this way' and xiaohei zi chouyan 'children smoke' are
sentential subjects which constitute islands for extraction of weisheme 'why'
and the A-not-A operator in LF.

Given the above evidence, we think it is justified to say that
sentence-final modals are matrix predicates that take sentential subjects as
their arguments as indicated in (15).

(15) [CP [IP [CP ni zheyang zuo] [I' bu [VP yingga]]]]

Before turning to further investigation of modals, it must be noticed
that though most of the above discussion is focused on the sentence-final
modals, we believe that the pre-VP modals like those in (4) should be
treated alike. As a matter of fact, we propose that the two different positions
of modals are related to a raising analysis of the modals. We postpone the
discussion until section 2.

1.2.2. Epistemic Modals and Sentential Complements.

Above, we have seen that the sentence-final modals yingga 'should' and
keyi 'may' may take a sentential argument. However, it was not mentioned
that they can only be interpreted as deontic. That is, yinggai ‘should’ in (4a) and (5a) and keyi ‘may’ in (4b) and (5b) do not indicate necessity or possibility, but indicate obligation and permission, respectively. In this section, we proceed to show that modals with the epistemic interpretation may also take a sentential complement as their argument. Consider the following examples.\(^5\)

\[(16)\]

\(a.\) yinggai you san-ge ren yijing chi-guo fan le\(^6\)

should have three-CL men already eat-ASP meal PAR

It ought to be the case that three men have already eaten their meals.

\(b.\) hui-bu-hui Lisi ye genzhe yiqi qu le\(^7\)

will-not-will Lisi also follow together go PAR

Could it be the case that Lisi went along with them?

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\(^5\) The abbreviations used in the glosses are the following: CL ‘classifier’, ASP ‘aspect marker’, QP ‘question particle’, PASS ‘passive marker’, PAR ‘particle’, GEN ‘genitive marker’.

\(^6\) In (16), you is inserted before the indefinite subject noun phrase. This is because Chinese generally does not allow an indefinite (nonspecific) subject, as (i) shows.

\(i.\) ?san-ge ren yijing chi-guo fan le

three-CL men already eat-ASP meal PAR

Three men have already eaten their meals.

\(^7\) Though the A-not-A form of the modal hui ‘will’ may take a clause with an overt subject, the simple base form hui ‘will’, interestingly, is not allowed to do so. Consider (i).

\(i.\) *hui Lisi ye genzhe yiqi gu-le-ma

will Lisi also follow together go-ASP QP

Will it be the case that Lisi went together with him?

We have no explanation for this fact. However, it should be noticed that not only would the A-not-A form of the modal hui ‘will’ render such sentences as (i) grammatical, but insertion of focus markers such as lian ‘even’ or shi ‘be’ would also improve the construction, as we can see below.
c.  keneng ta yijing chi-guo fan le
   possible he already eat-ASP rice PAR
   It is possible that he has already eaten his meal.

Each of the modals in the above examples takes an object clausal complement and can only have the epistemic interpretation. Again, this indicates that modals in Chinese cannot be constituents in INFL, since INFL always takes a VP complement rather than CP complement. But if they are verbs, it is only natural that they take a CP complement.

1.2.3. Modals and Reason Clauses

Another piece of evidence in favor of modals as matrix predicates can be constructed by taking the yinwei-clause ‘because-clause’ into consideration. Consider the examples in (17).

(17) a.  ni bu yingga/keyi yinwei Lisi shi ge mingren
       you not should/may because Lisi is CL famous-man
       suoyi jiu rang ta mianfei ruchang
       so then let him free-of-charge enter.
       You should/may not let Lisi enter free of charge
       because he is a famous man.

(ii) ?hui lian Lisi ye genzhe yiqi qu-le ma
   Will even Lisi also follow together go-ASP QP
   Will it be the case that Lisi also went with them?
(iii) a.  *hui Lisi ba wo de qian na-zou-le ma
         will Lisi BA I GEN money take-away-ASP QP
         Would it be the case that Lisi took my money away?
   b.  hui shi Lisi ba wo de qian na-zou-le ma
      Would it be the case that Lisi took my money away?
b. ta bu hui yinwei Lisi shi ge mingren
   he not will because Lisi is CL famous-man
   suoyi jiu rang ta mianfei ruchang
   so then let him free-of-charge enter
   It will not be the case that he will let Lisi enter
   free of charge because he is a famous man.

c. ta juedui bu gan yinwei Lisi shi ge
   he definitely not dare because Lisi is CL
   mingren suoyi jiu rang ta mianfei ruchang
   famous-man so then let him free-of-charge enter
   He definitely dare not let Lisi enter free of charge
   because he is a famous man.

It is well-known that English sentences with the pattern not ... because are ambiguous, depending upon whether or not the because-clause falls within the scope of not, i.e., whether or not the because-clause is c-commanded/m-commanded by the negator. If the scope of the yinwei-clause is within that of the negative, then the former is immediately dominated by VP; if not, it is immediately dominated by S (= IP) or S' (= CP). Interestingly, unlike the English glosses, all the examples in (17) have only one interpretation according to which the scope of the yinwei-clause falls within that of the negative bu 'not'. It thus seems that the reason clauses in (17) are immediately dominated by VP, with a structure like the following.

- 64 -
(18) IP
   / \
  I'
   / \  
  I   VP
   / \ /______\
  bu yinggai yinwei .....VP
  keyi

Nevertheless, on the basis of Jo-wang Lin's suggestion, C.-C. Tang (1990) proposes that reason clauses in Chinese may be licensed by C, and hence dominated by C' or CP. Their considerations go as follows. To begin with, consider (19).

(19) a. yinwei Lisi shi-ge mingren, suoyi wo jiu rang ta mianfei ruchang
    because Lisi is CL famous-man so I then let him free-of-charge enter
    Because Lisi is a famous man, I let him enter free of charge.

   b.*yinwei Lisi shi-ge mingren, wo suoyi jiu rang ta mianfei ruchang

   c.*suoyi yinwei Lisi shi-ge mingren wo jiu rang ta mianfei ruchang

The examples in (19) show that the yinwei-clause has to surface before the clause connective suoyi 'so', which in turn obligatorily appears to the left of an IP. In other words, reason clauses in Chinese, which occur outside suoyi 'so', cannot be immediately dominated by VP, but must be immediately dominated by some constituent larger than IP.

Second, though a constituent may be topicalized to a position after the connective as in (21), topicalization of the same element is barred to a position between the reason clause and the connective as in (22).
(20) yinwei jingfei bu gou, suoyi wo jueding quxiao zhe-ci huodong  
      because outlay not enough so I decide cancel this-CL activity  
      Because the outlay is not enough, I decided to cancel the activity.
(21) yinwei jingfei bu gou, suoyi zhe-ci huodong wo jueding quxiao
(22) *yinwei jingfei bu gou, zhe-ci huodong suoyi wo jueding quxiao

To explain the contrast between (21) and (22), Lin suggests that connectives like suoyi take the position of COMP as in (23), and thus it follows from the assumption of topicalization as a case of IP-adjunction that topicalized constituents can only surface after the clause connective, but not in between the reason clause and the connective. If this suggestion is on the right track, then the yinwei-clause must be dominated by some projection of COMP. 8

(23) CP.
    / \  
   C' /  
   / \  
   C ' IP
  / _ \  
 suoyi ......  

Finally, a reason clause cannot occur to the right of a connective, as in (24).

8 Note also that as Jo-wang Lin (personal communication, 1990) points out, if the clause connective does not take the position of COMP, but instead is adjoined to IP, then the ill-formed (22) will be yielded, since topicalization, which involves IP-adjunction, allows the topicalized constituent to be adjoined to the IP dominating the connective and the clause that follows.
(24) a. *suoyi yinwei Lisi shi-ge mingren, wo jiu rang ta mianfei ruchang
    so because Lisi is CL famous-man I then let him free-of-charge enter
    b. *suoyi wo yinwei Lisi shi-ge mingren, jiu rang ta mianfei ruchang

If the analysis of suoyi 'so' is correct, then to rule out (24) as ill-formed,
the yinwei-clause cannot be immediately projected under IP or VP, for it is
the very structure that generates the ill-formed sentences in (24).\(^9\) In view of
this, reason clauses in Chinese need to be projected under C' or CP.

Now let us return to (17), where the yinwei-clause occurs after the
modal, but before the connective suoyi 'so'. If the above remarks are right,
then the structure of (17) must be something like [... [modal [CP yinwei ...
suoyi ...]]]. The structure, again, indicates that modals in Chinese are verbs
that are subcategorized for CP complements rather than constituents of INFL
that take VP complements.

1.2.4. Adjacent Modals

There is another salient property of Chinese modals which also
constitutes a good argument for the view that they are generated under the
V node. Unlike English modals, Chinese modals allow for multiple occur-
cences as illustrated below.

(25) ta yinggai hui lai
    he should will come
    It ought to be the case that he will come.

\(^9\) C.-C. Tang (1990) has pointed out that the ill-formedness of (24) has to do not
only with syntactic structure but also with pragmatic/semantic considerations
concerning the presupposition of clause connectives.
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(26) ta keneng hui (yuanyi) lai
    he possible will willing come

It is possible that he will (be willing to) come.

(25) and (26) above contain two and three adjacent modals respectively. More interestingly, each of the adjacent modals may be negated by an independent negative bu, as (27)-(28) illustrate.

(27) ta bu yinggai bu hui bu lai
    It ought not to be the case that it is not possible that he will not come.

(28) ta bu keneng bu hui bu yuanyi lai
    It is not possible that he will not be unwilling to come.

The multiple occurrences of bu ‘not’ in examples like (27)-(28) strongly suggest that modals in Chinese are not constituents of INFL, since each clause presumably contains only one NEG node. But suppose we assume that each of the adjacent modals is an independent verb which is subcategorized for a clause; then it is straightforward to account for the multiple occurrences of the modals and the negative bu ‘not’ (cf. Huang (1988)). If every modal is an independent verb of its own clause, then it is natural that each modal can be negated by one independent negative, since each clause has its own NEG node.

In this connection, consider (29).

(29) ni yinggai bu hui (hai) meiyou chi-fan bu
    you should not will yet haven’t eat-rice PAR

    It should not be the case that you haven’t eaten your meal yet.

(29) shows that not only the modal hui ‘will’ but the verb chi ‘eat’ may be negated by an independent negative. Furthermore, the tense of the verb, as indicated by meiyou ‘has not’, is different from that of the modal, as
indicated by *bu* 'not'. This fact can be explained, only if the relevant construction involves two different clauses. For only under this analysis will there be two tense nodes with which the modal and the verb can be associated respectively. In other words, the modals in (29) must be verbs that are subcategorized for a CP clause.

1.2.5. Modal and Topic Sentences

The fourth argument to support the matrix-predicate analysis of modals is related to constructions such as (81), which contain a base-generated topic in the embedded clause. As is well-known, a base-generated topic need not involve a gap in the comment clause and is always possible as long as the "aboutness" condition is satisfied (cf. Xu and Langendoen (1985)). One such example is the following.

(80) shuiguo, wo zui xihuan pingguo

Fruit I most like apple
As for fruits, I like apples most.

What interests us most about this type of sentence is the locus of the base-generated topic in constituent structure. Based on a number of independent phenomena, C.-C. Tang (1990) has shown that a base-generated topic in Chinese is adjoined to CP. Assuming that her arguments are correct, now consider the examples in (81).10

(81) a. ta bu keneng [shuiguo zhi chi pingguo]

he not possible fruit only eat apple
It is not possible that as for fruits, he eats only apples.

10 Some speakers feel that examples like those in (81) are only marginal.
b. xiaohaizi bu yinggai [shuiguoshì chi pingguo]
   children not should fruit only eat apple
   As for fruits, children are not allowed to eat only apples.

The examples in (91) show that modals in Chinese may be followed by a complement containing a base-generated topic. If C.-C. Tang's analysis is right about the locus of base-generated topics, it is clear that modals in Chinese do not take VP complements but CP complements. In other words, modals are independent predicates subcategorized for a proposition.

1.3. Summary

To summarize this section, the empirical facts in Chinese indicate that modals in Chinese are best analyzed as verbs rather than constituents of INFL. Especially, the facts suggest that the structure of sentences with modals is something like [CP ... [IP NEG [VP MODAL [CP ... [IP ... ]]]]].

2. Raising and Control Modals

In this section, we will show that modals can be divided into two types, one being raising modals and the other being control modals.

2.1. Selectional Restrictions

Tang (1979) and Huang (1988) have observed that not all modals are alike with respect to licensing of their subject. They have pointed out that modals such as yinggai ‘should’, keyi ‘may’, the epistemic hui ‘will’, etc., differ from gan ‘dare’, ken ‘be willing to’, neng ‘be able to’, the deontic hui ‘be able to’, etc., at least in one respect; that is, while the former impose no selectional restrictions on the subject, the latter require that their subject be animate.
(32) a. ta chi-guo fan le
    he eat-ASP meal PAR
    He has eaten his meal.

b. ta yinggai chi-guo fan le
    he should eat-ASP meal PAR
    It should be the case that he has eaten his meal.

c. ta keneng chi-guo fan le
    he possible eat-ASP meal PAR
    It is possible that he has eaten his meal.

d. shu zhangjia le
    books increase-price PAR
    The price of books has increased.

e. shu yinggai zhangjia le
    book should increase-price PAR
    It should be the case that the price of books has increased.

f. shu keneng zhangjia le
    book possible increase-price PAR
    It is possible that the price of books has increased.

(33) a. ta gan/yuanyi/neng lai
    he dare/willing/able come
    He dare/is willing to/is able to come.

b. *shu gan/yuanyi/neng zhangjia
    book dare/willing/able increase-price
    The price of books dare/is willing to/is able to increase.

The examples in (32) show that whatever can be the subject of the VP following the modal can be the subject of the modal. But this is not the case in (33). The modals in (33) require that their subject be animate. As
Huang (1988) pointed out, the fact that the modals in (32) impose no selectional restriction on the subject, together with the consideration that they may take a clause as their complement, seems to suggest that the sentences in (32) can be analyzed as raising constructions with the embedded subject moved to the matrix subject position. That is, examples (32b), (32c), (32e) and (32f) would have a structure like the following.

\[(34)\ a. \ [ta_i \ [keneng/yinggai \ [t_i \ chi-guo \ fan \ le]]]\\
b. \ [shu_i \ [keneng/yinggai \ [t_i \ zhangjia \ le]]]\\
\]
The derivations in (34) explain why the subject of the VP can always be the subject of the modal.

Next, consider (33). Since modals of the type in (33) have selectional restrictions on the subject, it seems to suggest that the subject of the modals is selected by the modal and base-generated in its surface position.

\[(35) \ [ta \ [gan/yuanyi/neng \ [chi fan]]]\\
he dare/be willing to/be able to eat rice\\
\]
In other words, the subject ta ‘he’ in (35) receives its theta-role from the modal. Yet, the verb chi ‘eat’ also has an external theta role to discharge. It cannot be assigned to the subject ta ‘he’, since it would otherwise receive two theta roles, violating the theta criterion. But then, what receives the external theta-role of the verb? We claim that (35) in fact involves a control construction with an empty PRO in the embedded clause. It is this PRO that receives the external theta role.

\[(36) \ [ta \ [gan/yuanyi/neng \ [PRO \ chi \ fan]]]\\
As a matter of fact, the proposed analysis of Chinese modals is not novel at all. Based on different languages, many linguists have suggested that the problem of selectional restrictions imposed by modals may be explained by postulating that those which do not impose selectional restrictions on the
subject are raising verbs, while those which do are control verbs (cf. Traisson (1986), Picallo (1990), among others). Moreover, the classification seems to correspond to the distinction between epistemic modals and deontic modals, respectively.

2.2. The Analysis of Deontic yinggai and keyi

Though the epistemic/deontic interpretations of modals seem to correspond to the raising/control classification of modals, the modals yinggai 'should' and keyi 'may' do not fall under this classification so neatly. There is no problem with analyzing the epistemic yinggai 'It ought to be the case that ...' and keyi 'It is possible that ...' as raising modals. But analyzing the deontic yinggai 'be supposed/obliged to' and keyi 'be allowed/able to' as control modals does not seem to be well-motivated. To see why, let us begin with the interpretations of the deontic keyi. The deontic keyi has two interpretations. It may either denote the speaker's permission to the subject of the sentence or indicate the ability of the subject of the sentence, as the following examples show.

(87) ni keyi qu Taipei
you may go Taipei
You are allowed to go to Taipei.

(88) ta yijing keyi changhuan zhaiwuli
he already able pay debts PAR
He is already able to pay his debts.

Though the ability reading of keyi may be analyzed as a control modal, it seems problematic to treat the permission reading of keyi as a control modal. Below, we will discuss the permission reading of keyi along with the deontic yinggai to show that they are best analyzed as raising modals rather than
control modals.

The deontic usages of yinggai ‘be supposed/obliged to’ and keyi ‘be allowed to’, just like their epistemic counterparts, allow for either an animate or an inanimate subject, as illustrated more clearly below.

(39) a. ta yinggai lai
    he should come
    He is supposed/obliged to come.

b. ta yinggai lai le
    he should come PAR
    It ought to be the case that he has come.

c. shu yinggai zhangjia
    book should increase-price
    The price of books is supposed to increase.

d. shu yinggai zhangjia le
    book should increase-price PAR
    It ought to be the case that the price of books has increased.

(40) a. ta keyi lai
    he may come
    He is permitted to come.

b. ta (yinggai) keyi tong-guo kaoshi
    he should may pass-ASP exam
    (It should be the case that) It is possible that he will pass the exam.

c. shu keyi quanbu maidiao
    books may all sell-out
    Books are allowed to be sold out.
d. shu (yinggai) keyi mai de hen hao
   book should may sell DE very well
   (It should be the case that) It is possible that books may sell well.

(39) and (40) show that whatever can be the subject of the VP can be the subject of the deontic yinggai 'should' and keyi 'may'. It is therefore reasonable that the deontic usage of yinggai 'be supposed/obliged to' and keyi 'be allowed to' is treated on a par with the epistemic counterparts. As it is, from the viewpoint of semantics, the deontic interpretations of these two modals are roughly identical to the interpretations of the corresponding English passive predicates. Since passive predicates do not assign theta-roles to their subject position, it is reasonable that the deontic yinggai 'should' and keyi 'may' also do not have the property of assigning a theta-role to their subject position. That is, they are raising predicates.

A second argument in support of the raising analysis of the deontic yinggai 'be supposed/obliged to' and keyi 'be allowed/permit to' is that though examples like (4), repeated below, may be analyzed as involving a control construction with the subject controlling an empty PRO, examples like (5), also reproduced below, can in no way be analyzed as instances of control construction, since there is no possible controllee at all.

(4) ni bu yinggai zheyang zuo
    you not should this-way do
    You should not do it this way.

11 That be supposed to, be allowed to, etc., are the periphrastic counterparts of the corresponding modals should and may can be found in works such as Lakoff (1972), Bouma (1975) and Palmer (1979).
(5) ni zheyang zuo bu yinggai  
you this-way do not should  
You should not do it this way.

But if the modals in (4)-(5) are treated as raising verbs, then not only may the word order in (5) acquire a natural explanation but (4) can be related to (5) in a principled way. Consider the alternation in (41).

(41) a. That the earth is round is believed (by everybody).
    b. The earth is believed to be round (by everybody).
(41) indicates that when a matrix verb is a raising predicate, either the whole complement of the verb or the internal subject of the complement may be moved to the matrix subject position. Now, suppose that the deontic yinggai ‘be supposed/obliged to’ and keyi ‘be allowed to’ are analyzed as raising predicates. Then, (5) can be assimilated to (41a) with the whole object complement raised to the matrix subject position and (4) to (41b) with the internal subject of the complement being raised from the embedded clause to the matrix clause.

2.3. Summary

In summary, modals in Chinese can be classified as follows:

(42) Raising modals: keneng ‘possible’, yinggai ‘It should be the case that …’, yinggai ‘be supposed/obliged to’, keyi ‘It may be the case that’, keyi ‘be allowed to’, hui ‘It will be the case that …’, etc.\(^\text{12}\)

\(^{12}\) A reviewer questions why the pattern [S hui] is not permitted if hui ‘will’ is a raising predicate. To answer this question, it should be first pointed out that English raising predicates display three patterns, as illustrated below.
Control modals: keyi ‘be able to’, hui ‘be able to’, gan ‘dare’, ken ‘willing’, neng ‘be able to’, xiang ‘want’, yuanyi ‘willing’, etc.

3. More Supporting Arguments

In this section, we will give more evidence to support the classification in (42).

3.1. Modals and Intensifying zijn

Chinese zijn ‘self’ has various functions in a sentence. It may function as an anaphor bound by the subject as in (48)

(A) Seem-type:
(a) The earth; seems [t₁ to be round].
(b) * [That the earth is round]; seems t₁.

(B) Be-believed type
(a) [That the earth is round]; is believed t₁ by everybody.
(b) The earth; is believed [t₁ to be round] by everybody.

(C) Be-taught type
(a) [That the earth is round]; is taught t₁ in the classroom.
(b) *The earth; is taught [t₁ to be round] in the classroom.

The above three patterns show that whether or not an embedded subject or the whole embedded complement can be raised depends upon the idiosyncratic properties of the matrix predicates. (The idiosyncracy might be derived from something which is still unknown at present stage.) Given this, it is not a surprise that some Chinese raising modals such as hui ‘will’ may allow only the embedded subject to be raised, while other raising modals such as yingzi ‘should’ and keyi ‘may’ allow either the subject or the whole embedded complement to be raised. Surely, to give a full analysis of the different raising possibilities is beyond the scope of the present paper. We therefore leave this topic to future research.

— 77 —
(43) Lisi xihuan ziji
Lisi likes self
Lisi likes himself.

or as a subject-oriented intensifier as in (44).

(44) Lisi ziji qu Taibei
Lisi self go Taipei

The first function of ziji ‘self’ is not relevant to our concern. But the second function is worth more commenting before we proceed to further discussion. The intensifying function of ziji ‘self’ has two usages. It may intensify either a subject or the predicate phrase that follows it. Thus, (44) is ambiguous, depending upon what ziji ‘self’ intensifies. It may either intensify the subject Lisi, or intensify the verb phrase following it. That ziji ‘self’ in (44) has two different usages becomes even more perceptible when an adverb is inserted. Consider the contrast between (45a) and (45b).

(45) a. [Lisi ziji] jingchang qu Taibei
      Lisi self often go Taipei
      Lisi himself often goes to Taipei.

b. Lisi jingchang [ziji qu Taibei]
      Lisi often self go Taipei
      Lisi often goes to Taipei by himself.

(45a) and (45b) show that the adverb jingchang ‘often’ may appear not only in between ziji ‘self’ and the verb phrase, but also in between the subject and ziji ‘self’ with a change in meaning. It is clear then that ziji ‘self’ can intensify either the subject or the predicate phrase following it.

Now consider the following paradigm, in which ziji ‘self’ is intended to function as a VP modifier.13

13 The addition of shi ... de in the examples below is intended to make it clear
(46) a. ta yinggai ziji qu Taibei
   he should self go Taipei
   He is supposed to go to Taipei by himself.

b. *ta (shi) ziji yinggai qu Taibei (de)
   He is supposed to go to Taipei by himself.

(47) a. ta keneng ziji qu Taibei
   he possible self go Taipei
   It is possible that he goes to Taipei by himself.

b. *ta (shi) ziji keneng qu Taibei (de)
   It is possible that he goes to Taipei by himself.

(48) a. ta yuanyi ziji qu Taibei
   he willing self go Taipei
   He is willing to go to Taipei by himself.

b. ta (shi) ziji yuanyi qu Taibei (de)
   He is willing to go to Taipei by himself.

(49) a. ta xiang ziji qu Taibei
   he want self go Taipei
   He wants to go to Taipei by himself.

b. ta (shi) ziji xiang qu Taibei (de)
   He wants to go to Taipei by himself.

The above paradigm shows that while the VP-modifying ziji 'self' can surface either before or after modals like yuanyi 'willing' or xiang 'want', it can only occur after modals like yinggai 'should' or keneng 'possible'. This, we take to be evidence for distinguishing raising modal verbs from control modal verbs. The argument goes like this. Suppose that modals like yinggai 'should' and

that ziji 'self' goes with the modal following it rather than with the subject preceding it.
keneng 'possible' are indeed raising predicates; then the matrix subject position of (46b) and (47b) is unfilled at D-structure, i.e., it is an empty position with no features at all. It follows from this that the subject-oriented intensifier ziji 'self' cannot be properly licensed by a subject in the matrix clause in (46b) and (47b). (We assume that the relation between the intensifying ziji 'self' and its licenser is established at D-structure.) Hence, (46b) and (47b) are ill-formed. On the other hand, suppose that modals like yuanyi 'willing' and xiang 'want' are control verbs; then the surface subjects of (48b) and (49b) are the base-generated subjects. In addition, the embedded subject position is filled by an empty PRO with features. Therefore, it is possible to place ziji 'self' either before or after the modal. In either case, the intensifying ziji 'self' is properly licensed and identified by a subject with content. The contrast between (46b), (47b) and (48b), (49b) thus supports the analysis that modals like yinggai 'should' and keneng 'possible' are raising predicates and those like yuanyi 'willing' and xiang 'want' are control predicates.16

14 Note that ziji 'self' is not always licensed and identified by a subject at D-structure. It may also be licensed and identified by an object NP at D-structure. Consider (i) and (ii).
(i) a. [NP e] ye bei Lisi chumai-le Zhangsan ziji
    also by Lisi betray-ASP Zhangsan self
    b. [Zhangsan ziji] ye bei Lisi chumai-le tī
    Zhangsan himself was also betrayed by Lisi.
(ii) wo zhi jian-guo Zhangsan ziji, bu cen jian-guo ta taitai
    I only see-ASP Zhangsan self not ever see-ASP his wife
    I only saw Zhangsan himself, but never his wife.

15 For the assumption that subject-oriented elements are licensed at D-structure, also see Istridou (1990).

16 Note that when ziji 'self' is construed as a subject intensifier rather than a VP intensifier, it may occur before the proposed raising modals, as illustrated in (i).
(i) [Lisi ziji] hui/yinggai qu Taibei
Note that the above remarks also hold true of modals like hui and keyi, which can be analyzed as either raising verbs or control verbs depending upon their interpretations. First consider the case of hui.

(50) Lisi hui [ziji qu Taibei]
   a. Lisi will go to Taipei by himself.
   b. Lisi knows how to go to Taipei by himself.

As the two translations of (50) indicate, (50) is ambiguous. Epistemically, hui indicates future prediction (or possibility) and is analyzed as a raising verb under our analysis; deontically, it imposes the property of ability on the subject and is a control verb under our analysis. Interestingly, when the intensifying ziji 'self' appears before the modal, the ambiguity disappears.

(51) Lisi [ziji hui qu Taibei]  
    Lisi self can go Taipei  
    Lisi knows how to go to Taipei by himself.

The modal in (51), as opposed to that in (50), can only have the deontic interpretation, not the epistemic interpretation. Again, this follows from the previous analysis. The surface subject of the epistemic modal hui is a derived subject and therefore ziji 'self' cannot be properly licensed by a commanding NP within its clause at D-structure, if it appears before the modal; on the other hand, the surface subject of the deontic hui is a

Lisi self will/should go Taipei
Lisi himself will/should go to Taipei.

Being a subject intensifier, ziji in (51) forms a constituent with the subject Lisi. Therefore, after it is licensed by the subject at D-structure, it can be raised to the matrix subject position together with the subject it intensifies. Hence the subject intensifier ziji 'self' may occur before raising modals. The following derivation would make this point clear.

(ii) a. [NP e ] hui/yinggei [Lisi ziji] qu Taibei]
   b. [Lisi ziji]; hui/yinggei [u qu Taibei]
base-generated subject, hence allowing the pre-modal ziji 'self' to be properly licensed by the subject at D-structure.

Next consider the case of keyi 'may'. keyi is different from hui, in that in addition to the epistemic interpretation, it has two deontic interpretations, one indicating permission of the speaker and the other indicating the ability of the subject of the sentence. Crucially, under our analysis, the epistemic interpretation and the permission interpretation involve a raising construction whereas the ability interpretation involves a control construction. This distinction is also reflected in their interaction with the intensifying ziji 'self'. Consider (52).^{17}

(52) Lisi keyi [ziji qu Taibeı]
   a. Lisi is allowed to go to Taibeı by himself.
   b. Lisi knows how to go to Taibeı by himself.

Like (50), (52) is ambiguous. However, when ziji appears before the modal, the permission reading of the modal becomes impossible.

(53) Lisi [ziji keyi qu Taibeı]

   Lisi knows how to go to Taibeı by himself.

It goes without saying that the contrast between (52) and (53) comes from a distinction between raising vs. control analysis of the two interpretations of the modal. (52)-(53) thus further support the postulation of raising and control modals in Chinese.

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17 Though the modal keyi may have an epistemic interpretation meaning 'possible', this interpretation is not available in (52). This is because keyi is most easily interpreted as epistemic when it is used in combination with the modal yinggai 'should'. In other contexts, the epistemic interpretation is generally unavailable.
3.2. Modals and lian-construction

In Chinese, lian 'even' is generally taken as a focus marker, adding emphasis to a constituent.\(^\text{18}\) If this emphasized constituent is an object, it would be proposed to sentence-boundary position, as illustrated below.

(54) lian neiben shu, ta dou kan-le
   even that-CL book he also read-ASP
   He read even that book.

What is interesting about this construction is that lian 'even' may also emphasize a clause as shown in (55).

(55) lian qian diao-le ta dou bu zhidao
   even money lose-ASP he also not know
   He even doesn't know his money was lost.

However, when lian-construction is applied to sentences containing modals, grammatical judgments differ according to the type of modals involved. Consider the examples below.

(56) a. Lisi bu yinggai/keyi jiegei Wangwu yibai yuan
   Lisi not should/may lend Wangwu one-hundred dollar
   Lisi is not supposed/permitted to lend Wangwu one hundred dollars.

b. *lian jiegei Wangwu yibai yuan, Lisi dou bu yinggai/keyi \(^\text{19}\)

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\(^{18}\) One can analyze lian as either a preposition or a focus adverb (particle). Under either analysis, our conclusion below is not affected.

\(^{19}\) In (56), both the modals yinggai and keyi are interpreted as deontic. But even with an epistemic interpretation, the construction (56b) is still bad, as (i) shows.

(i) a. Lisi yinggai jie-guo yibai yuan, gei Wangwu
   Lisi should lend-ASP one-hundred dollar to Wangwu
   It ought to be the case that Lisi lent Wangwu one hundred dollars.

b. *lian jie-guo yibai yuan gei Wangwu, Lisi dou yinggai
   (lit.) Even lend Wangwu one hundred dollars Lisi is supposed/permitted to.
In (56) and (57), the modals involved are raising verbs and control verbs, respectively, under our analysis. What is more, lian seems able to emphasize only the complement of control modals, which also holds true of ambiguous modals like hui as the contrast between (56f) and (57d) shows. We suggest that this contrast be explained in terms of a distinction between trace and PRO. Within the framework of GB theory, while a trace is subject to the
Empty Category Principle (ECP), PRO is not. Given this, now consider the derivation of (56b), (56d) and (56f). Suppose that the modals in (56) are raising verbs, then the derivations of (56b), (56d) and (56f) are the following.

(58) a. *lian [ti jiegei Wangwu yibai yuan], Lisi dou bu yinggai/keyi
   b. *lian [ti jiegei Wangwu yibai yuan], Lisi dou bu keneng
   c. *lian [ti chidao], Lisi dou bu hui

In (58), the subject Lisi is moved from the embedded subject to the matrix subject position and leaves a trace behind, which should be properly governed according to the ECP. However, the trace cannot be properly governed. It is not head-governed because the only possible head governor is lian but lian, being a focus adverb or preposition, can not be a proper head governor. It is not theta-governed, because it is not directly theta-marked by a verb. Antecedent-government also fails because after the object clause is preposed to sentence-initial position, the subject fails to c-command the trace. Hence, the ill-formedness of (56b), (56d) and (56f). On the other hand, the

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20 The ECP is defined as below.
   (i) ECP (cf. Chomsky (1981, 1986))
      A nonpronominal empty category must be properly governed.
      We assume a conjunctive formulation of the ECP as many others have argued recently, (See Rizzi (1990), among others).
   (ii) Proper Government
      A is properly governed iff
      (i) A is head-governed and
      (ii) A is antecedent-governed or theta-governed.

21 For more details on the ECP with respect to the standard case of raising modals, see section 4.1.

22 Whether INFL is a proper head governor depends upon whether one adopts c-command or m-command as part of the definition of head-government. In this article, we assume that proper head-government requires c-command.

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hand, suppose that the modals in (57) are control verbs; then the derivation of (57b) and (57d) have nothing to do with movement, since PRO is base-generated in its position. Consider the representations in (59).

(59) a. lian [PRO jiegei Wangwu yibai yuan], Lisi dou bu ken/yuanyi/gan
    b. lian [PRO xiezi], Lisi dou bu hui

In (59), the empty categories are PROs. Since PRO is not subject to the ECP, the representations in (59) do not violate the ECP and are well-formed. The contrast between (56) and (57) thus supports the postulation of raising and control modals in Chinese.

3.3. Modals and Ergative Verbs

A major characteristic of ergative verbs is that they allow their thematic object to surface in subject position at S-structure, as illustrated below (cf. Perlmutter (1978), Burzio (1986)).

(60) a. lai-le san-ge keren
    come-ASP three-CL guests
    There come three guests.
    b. (you) san-ge keren lai-le
    have three-CL guests come ASP
    Three guests come.

In (60a), the noun phrase san-ge keren 'three guests' is the D-structure object of the verb lai 'come', while in (60b), it has moved to the subject position. What interests us most about the ergative construction is that when the construction contains modals, two patterns seem to emerge. If the

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23 Ergative verbs are also known as unaccusative verbs as Perlmutter (1978), originally called them.
construction contains modals like yinggai 'should', keyi 'be allowed to' or keneng 'possible', the thematic object of the ergative verb may either stay at its D-structure object position, or optionally move to the subject position of the ergative verb or to the subject position of the modal. However, if the construction contains modals like xiang 'want', yuanyi 'willing' or gan 'dare', the thematic object cannot stay at its D-structure object position; nor can it move to the subject position of the ergative verb. Instead, it can only occur as the subject of the modal. These two patterns are illustrated below.

(61) a. mingtian de huiyi, you san-ge ren yinggai/keyi lai
    tomorrow GEN meeting have three-CL men should/may come
    As for tomorrow's meeting, three men are supposed/allowed to come.

b. mingtian de huiyi, yinggai/keyi you san-ge ren lai
    As for tomorrow's meeting, three men are supposed/allowed to come.

c. mingtian de huiyi, yinggai/keyi lai san-ge ren
    As for tomorrow's meeting, three men are supposed/allowed to come.

(62) a. mingtian de huiyi, (you) san-ge ren gan/yuanyi lai
dare/willing
    As for tomorrow's meeting, three men dare/are willing to come.

b. *mingtian de huiyi, gan/yuanyi (you) san-ge ren lai
    As for tomorrow's meeting, three men dare/are willing to come.
c. *mingtian de huiyi, gan/yuanyi lai san-ge ren
   As for tomorrow's meeting, three men dare/are willing to come.

We show below that the contrast between (61) and (62) follows from the hypothesis that the modals in (61) are raising verbs, while those in (62) are control verbs. Consider the examples in (62) first. The contrast between (62a) and (62b-c) obviously indicates that modals like gan 'dare' or yuanyi 'willing' require a subject of their own. Now suppose that the modals in (62) are treated as control verbs; then it follows from the control theory that the thematic object of the ergative verb lai 'come' cannot be an overt NP, but must be an empty PRO controlled by the matrix subject. This must be the case, because the verb lai 'come' has only one argument and therefore the only argument is controlled. On the other hand, since the modals in (61) are assumed to be raising verbs, there is no requirement that the thematic object of the verb lai 'come' be a controlled empty PRO. Hence it can stay at its D-structure object position or is optionally moved to subject position. The same remarks apply to the ambiguous usages of modals like hui 'will, can'. When hui 'will, can' is interpreted epistemically, its interaction with ergative verbs patterns with (61); and when it is interpreted as deontic, its interaction with ergative verbs patterns with (62). Thus the interaction between modals and ergative verbs further supports the analysis that the modals in (61) are raising verbs, whereas those in (62) are control verbs.

4. More on the Raising Analysis

In this section, we will address two further issues about the raising analysis of Chinese modals. One is related to the ECP and the other to Case and
empty expletives.

4.1. The Raising Analysis and the ECP

The raising analysis of the epistemic modals and the deontic yinggai 'be supposed/obliged to' and keyi 'be allowed/ permitted to' seems to pose a problem with respect to the ECP. As is well-known, raising structures generally involve a lexically-triggered S'-deletion that would delete the embedded S' from which the NP-subject is raised. However, under our analysis of raising modals, S'-deletion does not seem to be available. As we saw in (17) and (31), reproduced as (63) and (64), raising modals may take a complement with a reason clause as well as a complement with a base-generated topic.

(63) ni, bu yinggai [CP yinwei Lisi shi ge mingren
you not should because Lisi is CL famous-man
suoyi t i jiu rang ta mianfei ruchang]
so then let him free-of-charge enter
You should not let Lisi enter free of charge because he is a famous man.

(64) ta, bu keneng [CP shuiguo t zhi chi pingguo]
he not possible fruit only eat apple
It is not possible that as for fruits, he eats only apples.

Since complements with reason clauses and complements containing base-generated topics are immediately dominated by CP, the embedded S' (= CP) node in (63) and (64) cannot be deleted. The question thus arises as to how the trace in (63) and (64) left by the movement of the subject can be properly governed. To answer this, we might first note that there are two approaches to the subject-to-subject raising construction in the literature.
One approach is that the S' node dominating the embedded complement is deleted (cf. Chomsky (1982)); the other approach is that the S' node in question is not deleted, but is transparent (cf. Riemsdijk and Williams (1986)). Given that the embedded S' (= CP) node in (63) and (64) cannot be deleted, we are forced to conclude that it involves transparency rather than deletion, if the trace is to be properly-governed by the modal or the raised subject. Though this conclusion is in contrast to the current assumption, it should be noted that the transparency approach is not necessarily inferior to the deletion approach, in that both approaches involve a stipulation triggered by individual lexical entry. As a matter of fact, if our analysis of (63) and (64) is correct, it might be the case that the S'-deletion approach is not on the right track.

Further evidence in support of the CP-transparency approach to raising constructions can be obtained from the fact that passivization is possible from the subject of a finite clause in Chinese. Consider the pair in (65).

\begin{align*}
\text{(65) a.} & \quad \text{wo renwei Lisi shi ge hen hao-de xiaobai} \\
& \quad \text{I think Lisi is a very good child} \\
& \quad \text{I think Lisi is a very good boy.} \\
\text{b.} & \quad \text{Lisi bei renwei t\_ shi ge hen hao-de xiaobai} \\
& \quad \text{Lisi PASS thought is a very good child} \\
& \quad \text{Lisi is thought to be a very good boy.}
\end{align*}

In (65a), the embedded clause is a finite clause which according to the current assumption is a CP. Since the embedded CP does not constitute a barrier for proper government of the embedded subject trace in (65b), it seems that the embedded CP is transparent.

Still another fact to be noted concerning CP-transparency is related to the fact that long distance binding of a subject reflexive is permitted in
Chinese, as illustrated below.

(66) Li xiaoqie renwei ziji zui piaoliang
Li Miss think self most beautiful
(lit.) Miss Li thinks that herself is the most beautiful.

Here we see another case where CP does not block long-distance binding between an element contained in CP and one which is outside the CP. This fact suggests another alternative to look at the problem of NP-raising out of an embedded CP. That is, NP-raising out of a tensed clause might be unified with long distance binding of a subject reflexive in terms of the Generalized Binding Theory as proposed in Aoun (1985, 1986).

Let us first consider the case of long distance binding of a subject reflexive within the Generalized Binding Theory. Since the Chinese language lacks AGR, the embedded CP in (66) contains no accessible SUBJECT and hence is not the governing category of the anaphor. Instead the matrix clause is the governing category of the anaphor since there is an accessible SUBJECT, i.e. Li xiaoqie, in this category. Now return to (58) and (64). Suppose, following Aoun (1985, 1986), that NP-traces are anaphors subject to Binding Principle A. Then, in (58) and (64), what is important is not that the trace must be properly governed, but that the trace must be bound in its governing category. Since the governing category of the trace is the same as the

24 Aoun's Generalized Binding Principles are the following.

(i) Binding Principles
A. An anaphor must be X-bound in its governing category.
B. A pronoun must be X-free in its governing category.
C. An R-expression must be A-free.
   (where X = A or A')

(ii) Governing Category
B is a governing category for A iff B is the minimal maximal projection containing A, a governor of A and a SUBJECT accessible to A.
anaphor in (66), it can be long-distance bound by the matrix subject. Under this account not only may we account for the parallel between (66) and (63), (64), (65) but it becomes immaterial whether NP-raising out of an embedded CP involves transparency or deletion of S'.

Finally, it is worth pointing out that CP transparency is by no means an isolated phenomenon in Chinese. Rivero (1987), Campos (1989) and Yoon (1991) have, independently of us, found that raising and passivization are possible from a tensed CP clause in modern Greek, Spanish, Korean, Quechua, Niuean and Kipsigis. Given this, it seems clear that CP-transparency is a cross-linguistic phenomenon that must be dealt with by parametric theories.

It is beyond the scope of this paper to discuss what mechanism makes CP-transparency possible and what parameter distinguishes NP-raising out of IP in languages like English from NP-raising out of CP in languages like Chinese. For discussion of this issue, see, for instance, Yoon (1991), in which she claims that the A/A-bar nature of the Spec of CP and adjoined positions should vary across languages. For languages like Korean and Chinese, the Spec of CP can be an A-position. Hence, NP-movement through the Spec of CP will not violate the Illicit Movement Condition and non-clause-bounded NP-movement is possible. On the other hand, for languages like English, the Spec of CP is not an A-position, and thus subject NPs can only be extracted out of IP. Moreover, Yoon argues that traces of movement are not subject to the Binding Theory, but only to a version of the ECP conceived as a condition of Chains. If her claims are correct, then the CP-transparency/ECP approach to raising modals in Chinese is more desirable than the CP-deletion/Generalized-Binding approach.
4.2. Optional Raising, Case and Empty Expletives

Another phenomenon that must be addressed concerning the raising analysis of modals is why raising is not obligatory. Consider the following pairs of alternation.

(67) a. yinggai you san-ge ren yijing chi-guo fan le
should have three-CL men already eat-ASP meal PAR
It ought to be the case that three men have eaten their meals.

b. you san-ge ren yinggai yijing chi-guo fan le

(68) a. hui-bu-hui Lisi ye genzhe yiqi qu le
will-not-will Lisi also follow together go PAR
Will it be the case that Lisi also went along?

b. Lisi hui-bu-hui ye genzhe yiqi qu le

(69) a. keneng ta yijing chi-guo fan le
possible he already eat-ASP meal PAR
It is possible that he has already eaten his meal.

b. ta keneng yijing chi-guo fan le

It is well-known that within the framework of GB theory, NP-movement is motivated by lack of Case. The optimal hypothesis, of course, is that the Case-theoretic explanation carries over to the raising structures that we propose for sentences with raising modals. Indeed there are two such possible accounts for the optional raising of NP-subject. One is that raising modals may be optionally subcategorized for either a tensed complement or an infinitive complement.25 When the selected complement is tensed, then the embedded subject may obtain Nominative Case from the embedded tensed

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25 Since the Chinese language lacks overt morphology, it is difficult to distinguish whether or not a clause is tensed. But see Huang (1982) and Li (1985).
INFL, making movement unnecessary; when it is infinitive, the embedded subject may not acquire Case from the embedded INFL and thus has to move to the matrix subject position to be assigned Case by the matrix tensed INFL. In either case, there is no Case filter violation. The other approach is that raising modals are obligatorily subcategorized for tensed complements, but assignment of Nominative Case by INFL is optional. If the embedded tensed INFL does not assign Nominative Case, then the embedded subject has to move to the matrix subject position in order to acquire Case from the matrix INFL. If it does assign Nominative Case, the embedded subject may stay at its D-structure subject position. This explains why raising of NP-subject can be optional in Chinese.26

A second issue that must be addressed with regard to the optional raising concerns the status of the matrix subject when the embedded subject is not raised to the matrix subject position. Chomsky (1981, 1986) has proposed the Extended Projection Principle to account for the appearance of the semantically empty element it in such sentences as (70).

(70) It seems that John is smart.

26 It should be noted that the optionality of case-assignment has been assumed in Li (1985, 1990). That is, a potential case assigner need not discharge its case. Note also that, as will be argued in the following discussion, we claim that Chinese has null expletives. Therefore, the Extended Projection Principle will not be violated in cases with no raising of subject NPs. Given that, in addition to case-assignment, INFL has other properties like adjunct-licensing, the optionality of case-assignment by INFL raises no problem for the existence of INFL, either. In contrast to our approach, Yoon's (1991) analysis of the non-clause-bounded NP-movement argues that there is no intrinsic correlation between Case properties and Chain types. Thus, NP-traces are not necessarily Caseless and NP-movement is not necessarily obligatory, being triggered by the lack of Case. And Chains can bear more than one Case as long as each link of a Chain is uniquely Case-marked.
If the requirement that every clause have a subject is correct, then the existence of such sentences as the (a) examples in (67)-(69) would force us to conclude that these sentences have empty subjects, i.e., empty expletives, corresponding to the overt expletive it. However, Li (1985, 1990), in contrast to Huang (1988), has denied the existence of empty expletives in Chinese. In what follows, we will review her arguments, showing that she is not necessarily correct.

Li (1990) has essentially given three facts to support the non-existence of empty expletives in Chinese. We will consider them in order. First, she points out that examples like (71) are ill-formed.

(71) *keneng ta qu na
likely he go there

It is likely that he goes there. (Li 1990, p. 128)

However, as we have seen previously, speakers do accept such sentences (cf. (16c)). As a matter of fact, Li herself acknowledges that (72) below is grammatical.27

(72) ?keneng ta hui qu na
likely he will go there

It is likely that he will go there. (Li 1990, p. 129)

Yet, rather than taking (72) as evidence that keneng ‘possible’ may be subcategorized for a tensed clause, she attributes the grammaticality of (72) to the analysis that it is a sentence adverb, just as huoqu ‘perhaps’ is. Though we do not deny the possibility that keneng ‘possible’ may function as a sentence adverb, the point is that there are cases in which it cannot be analyzed as a sentence adverb. (73) is such a case.

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27 According to Li (1990, p. 150), the grammaticality of (71) ranges from totally acceptable to totally unacceptable.
(73) zheme jiandan de timu, bu keneng ta bu hui zuo
so simple DE question not possible he not will do
As for such simple questions, it is impossible that he is not able to
answer.

Just like (72), keneng ‘possible’ in (73) is followed by a clause with an overt
subject, though the object of the embedded verb zuo ‘do’ is topicalized.
However, (73) differs from (72) in that keneng ‘possible’ in the former case
is additionally negated by the negative bu. Crucially, this indicates that
keneng ‘possible’ in (73) is not a sentence adverb, since sentence adverbs
cannot be negated by bu, as we can see from (74) below.

(74) a. "ta bu huoxu hui lai
he not perhaps will come
b. *bu huoxu ta hui lai
not perhaps he will come

Thus, the modal keneng ‘possible’ is subcategorized for a tensed clause in
Chinese, which invalidates Li’s first argument.28

The second fact that Li cites to argue against the existence of empty
expletives in Chinese is related to the impossibility of extraposition in
Chinese, as illustrated by the following contrast:

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28 A reviewer pointed out that lexical negation is possible in Chinese as in
chufuyiliao vs. buchuyiliao ‘out of expectation vs. not out of expectation’. Given
this, the question should be reduced to whether or not bu keneng ‘not possible’
in (73) constitutes a lexical negator. We do not exclude the possibility that bu
keneng might form a lexical word, but there is evidence showing that in some
cases bu keneng is not a lexical word, since other elements such as tai ‘quite’
can be inserted between ‘bu ‘not’ and keneng ‘possible’.
(i) bu tai keneng ta bu hui zuo zhe-dao timu
not quite possible he not can do this-CL question
It’s not quite possible that he is not able to answer this question.
Given the grammaticality of (i), our point remains intact, regardless of whether
lexical negation is possible.

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(75) a. ta lai zher hen zhongyao
he come here very important
That he comes here is very important.
b. *hen zhongyiao ta lai zher
very important he come here
It is very important that he comes here. (Li 1990, p.190)

According to Li, (75b) can be ruled out by the Extended Projection Principle, if one assumes that no expletives can fill the vacated subject position, after the sentential subject is extraposed. This account, though plausible, is not necessary. There is a better alternative. Before we spell out the details, let us first note that the ill-formedness of (75b) might not have anything to do with whether or not the vacated position in (75b) is filled by an expletive, but with the general impossibility of rightward movement in Chinese (see also C.-C. Tang (1990)). Consider the following contrast between English and Chinese.

(76) a. A rumor that he is ill has been circulating.
b. A rumor has been circulating that he is ill.
(Radford 1989, p. 449)

(77) a. Lisi zao jiu puochan zhege xiaoxi yijing chuanpian-le
Lisi early already bankrupt this news already wide-spread-ASP
The news that Lisi has gone bankrupt early is already widespread.
b. *zhege xiaoxi yijing chuanpian-le Lisi zao jiu puochan
this news already wide-spread-ASP Lisi early already bankrupt
The news is already widespread that Lisi has gone bankrupt early.

(76) shows that an S-bar within an NP subject in English may be extraposed
to the end of the sentence. In contrast, (77) shows that Chinese does not allow such kind of extraposition. Significantly, the impossibility of extraposition from subject NPs in (77) strongly indicates that extraposition of the sentential subject in (75b) might not be due to the non-existence of empty expletives. In (77b), though the S-bar within the subject NP is extraposed to the end of the sentence, the matrix subject position is still filled by the subject zhe ge xiao xi ‘this news’. Yet, (77b) is as ungrammatical as (75b), suggesting that something other than the non-existence of empty expletives is responsible for the general impossibility of extraposition in Chinese. We propose that the impossibility of extraposition be traced back to Huang’s (1982) phrase structure constraint which says informally that Chinese phrase structures are head-final except at the lowest bar level, i.e., the one-bar level. Since extraposition, irrespective of extraposition of sentential subjects or extraposition from subject NPs, involves right-adjunction to a maximal projection, it creates a structure like (78), where YP is the extraposed clause right-joined to XP.

(78) \[ \begin{array}{c}
\text{XP} \\
/ \\
\text{XP} \quad \text{YP} \end{array} \]

However, the structure (78) violates the constraint that Chinese phrase structures must be head-final at two-bar level. Hence extraposition is not allowed in Chinese. This unified account of (75) and (77) weakens Li’s second argument for the non-existence of empty expletives in Chinese.

Li’s third argument for the non-existence of empty expletives is based on the fact that a postverbal NP cannot get Case by forming a Chain with the subject expletive. Consider (79), where the ergative verb tang ‘lie’ is followed by a duration NP and the argument of the ergative verb.
(79) a. *tang-le henjiu yi-ge ren
    lie-ASP long-time one-CL man
    There lay a man for a long time.

b. *tang-le yi-ge ren henjiu
    lie-ASP one-CL man long-time    (Li 1990, p.140)

According to Li, ergative verbs can assign Case to an NP in postverbal position.\(^{29}\) Now if another postverbal NP may receive Case by forming a Chain with an expletive in subject position, then there would be no account for the ungrammaticality of (79). Hence, Li concludes that expletive subjects do not exist in Chinese. This account, again, is not necessary. C.-C. Tang (1990, 1991), among others, has argued that when a postverbal duration/frequency phrase cooccurs with a postverbal argument to denote a non-activity reading, the argument must be definite. Consider the contrast below.

(80) a. wo jian-guo na-ge ren liang-ci
    I see-ASP that-CL man twice
    I saw that man twice.

b. wo jian-guo liang-ci na-ge ren
    I saw that man twice.

c. *wo jian-guo yi-ge ren liang-ci
    one-CL man
    I saw one man twice.

d. *wo jian-guo liang-ci yi-ge ren
    I saw one man twice.

\(^{29}\) According to Li, all verbs, whether transitive or intransitive, active or passive, assign Case. To discuss her theory about Case-assignment is far beyond the scope of this paper. But see C.-C. Tang (1990) for the view that only transitive verbs assign Case in Chinese.
So the ungrammaticality of (79) is not necessarily due to the non-existence of empty expletives, but could be due to the fact that the post-verbal argument has to be definite when it cooccurs with another post-verbal duration/frequency phrase.\textsuperscript{30} Again this weakens Li's claim that empty expletives do not exist in Chinese.

To recapitulate, Li's arguments for the non-existence of empty expletives do not seem to be convincing because modals in Chinese are subcategorized for a tensed clause with an overt embedded subject and the problematic cases that she discussed all have better alternative explanations. This being the case, it is still possible that empty expletives exist in the (a) examples in (67)-(69).\textsuperscript{31}

\textsuperscript{30} Note, however, that even if the indefinite noun phrase yige ren 'one man' in (79) is replaced by the definite noun phrase nage ren 'that man', the sentence is still ill-formed. This is because the post-verbal argument of ergative verbs must always be indefinite. But if the post-verbal argument is indefinite, it would be unable to cooccur with a duration/frequency phrase in post-verbal position. Put differently, the impossibility of such constructions as (79) is a conspiracy of two constraints: (i) the postverbal arguments of ergative verbs must be indefinite and (ii) when cooccurring with post-verbal duration/frequency phrases, the post-verbal arguments of verbs must be definite in order to denote a non-activity reading.

\textsuperscript{31} The following examples also point to the same conclusion.

(i) a. shi ta zuotian da-le ni
   be he yesterday beat-ASP you
   It is he that beat you yesterday.

b. ta shi zuotian da-le ni
   It is yesterday that he beat you.

c. shi-bu-shi ta zuotian da-le ni
   be-not-be he yesterday beat-ASP you
   Is it he that beat you yesterday?

Huang (1988) has argued that the copular verb shi 'be' in (i) is a raising verb. If he is right, then the existence of (ia) and (ic) also suggests that there is an empty expletive in these sentences, if the extended part of the Projection Principle is universal.
5. Concluding Remarks

In this article, based on a number of facts, we have proposed that Chinese modals are actually independent verbs that are subcategorized for CP complements. Furthermore, they should be divided into two types, that is, raising vs. control modals, a classification not always corresponding to the epistemic vs. deontic distinction. NP-raising out of an embedded CP is also discussed in relation to the ECP. We showed that raising constructions in Chinese, as opposed to those in English, should involve CP-transparency rather than CP (= S')-deletion. In contrast to Li's (1990) claim, we also argued that empty expletives might exist in raising constructions containing raising modals. In addition to the above conclusions, two additional consequences of our analysis of modals as verbs are worth mentioning here.

First, the analysis that Chinese modals are not constituents of INFL but are independent verbs incidentally conforms to Hyam's (1987) study of null subject parameter. She has proposed that whether or not a language is a null subject language is correlated to the possibility of generating auxiliaries in INFL. According to her, modal auxiliaries in non-null subject languages are generated under INFL, whereas modal auxiliaries in null subject languages are not constituents of INFL, but are generated under the V node. Given that Chinese is a null subject language, our analysis provides a further piece of evidence to support the correlation between null subject languages and the auxiliary systems.

Another consequence of the analysis that Chinese modals are verbs is that this analysis gives a nice explanation for the contrastive relative word order of modals and the negative between English and Chinese. Notice that
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while the negative not in English has to follow the modal that it negates, the corresponding negative bu 'not' in Chinese has to precede the modal that it negates. Compare the following contrast.

(81) a. He should/will not come.
    b. *He not should/will come.

(82) a. "ta yinggai/hui bu lai\textsuperscript{32}
       he should/will not come
       He should/will not come.
    b. ta bu yinggai/hui lai
       He should/will not come
       He should/will not come.

The English negative not has to follow modals, since the latter are constituents of INFL which take a position higher than the node NEG (cf. Pollock (1989), among others). On the other hand, if modals in Chinese are analyzed as verbs, then it is a natural consequence that the negative bu 'not' appears before modals, since the former occupies a position higher than the verbs.

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\textsuperscript{32} The sentence is ungrammatical only on the intended reading. When the sentence is interpreted with the scope of bu covering only the verb lai 'come' rather than yinggai/hui 'should/will', the sentence is well-formed.
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