

# Moving heads to specifiers

## Evidence from Mandarin multiple pre-subject modals

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**Abstract** Based on a hitherto neglected set of multiple pre-subject modal sentences, this squib offers a novel syntactic account of Mandarin modals whereby the derivation of pre-subject modal sentences involves Internal Merge of modals to specifiers of the left-peripheral focus projection. The current head-to-spec approach is shown to readily combine the main advantages of the two existing lines of analysis, i.e. the XP-movement approach and the traditional head-movement approach, which on their own can each offer only a partial account of the properties and patterns associated with Mandarin modal constructions. Our proposal lends novel support to recent claims that ‘true’ syntactic head movement targets specifier positions.

**Keywords** modals · head movement · (Internal) Merge · Mandarin

### 1 Introduction

A recalcitrant problem with the syntax of Mandarin modals concerns the flexible ordering of these modals with respect to the surface subject:

- (1) a. *Pre-subject modal sentence*  
**yinggai** Zhangsan xiang jia le  
should Zhangsan miss home SP  
‘It should be the case that Zhangsan misses home now.’

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The data reported in this squib have been cross-checked with five native speakers of Mandarin via direct elicitation (three naïve and two with a linguistics background, who are from Chongqing, Jiangsu, Shanghai and Sichuan; gender: two male and three female; age range: 21 – 56). Names of consultants to be included.

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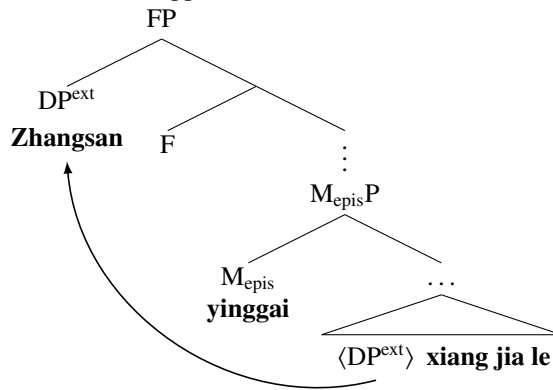
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- b. *Post-subject modal sentence*  
 Zhangsan **yinggai** xiang jia le  
 Zhangsan should miss home SP  
 ‘Zhangsan should miss home now.’

Cases involving single modals like (1a–b) have been well studied, and the common consensus is that modals are in their base position, and that post-subject modals are the result of XP-movement of the subject past the modal (see J.-W. Lin and Tang 1995; Tsai 2010, 2015; Lin 2011, 2012; Chou 2013 among others), which is taken to instantiate *raising* (e.g. Lin 2011, 2012; Chou 2013) or to always instantiate *topicalisation* (e.g. Tsai 2010, 2015). This general line of analysis will be referred to as the **XP-MOVEMENT APPROACH**.

(2) XP-movement approach



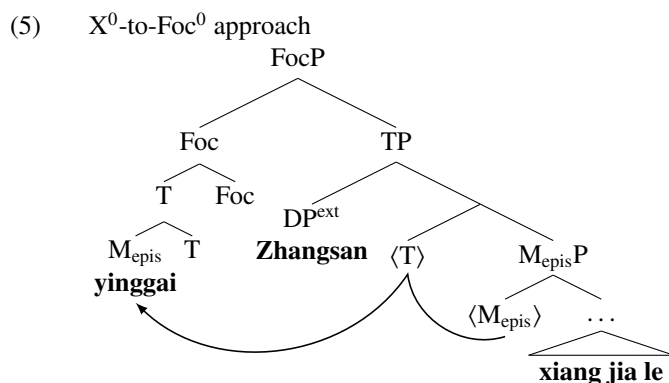
Few studies, however, have argued for a head-movement approach to pre-subject modal sentences like (1a), perhaps due to the fact that multiple modals may also appear in pre-subject or post-subject position of a Mandarin sentence. Notably, Lin (2012), which extends the theory proposed in Lin (2011), offers the first detailed study of the ordering restrictions which multiple-modal constructions exhibit. Below is an illustration of the derivation of a multiple post-subject modal sentence under Lin’s account:

- (3) [TP Zhangsan<sub>i</sub> T<sub>FIN</sub> [VP keneng [TP t<sub>i</sub> T<sub>FIN</sub> [VP keyi [TP PRO<sub>i</sub> T<sub>NONFIN</sub>  
 Zhangsan may be.allowed  
 jin xiancheng]]]]]  
 enter town  
 ‘It may be the case that Akiu is allowed to enter the town.’

On the other hand, Tsai (2015) proposes a different account of Mandarin modals within the cartographic framework, where the subject of a multiple post-subject modal sentence has undergone topicalisation:

- (4) [TopP Zhangsan<sub>i</sub> Top [M<sub>epis</sub>P keneng [TP t<sub>i</sub> T [M<sub>deon</sub>P keyi jin  
Zhangsan may be.allowed enter  
xiancheng]]]]  
town  
'It may be the case that Zhangsan is allowed to enter the town.'

In contrast, Hsu (2019) recently pursues an inspiring approach that differs from the previous analyses in deriving the pre-subject modal sentence *from* the post-subject modal one, such that the former will involve head movement of the modal to a left-peripheral X<sup>0</sup>-position (more specifically, Foc<sup>0</sup>):



Hsu offers convincing arguments that the popular XP-movement approach in (2) fails to capture focus-related properties associated with the pre-subject modal construction, a situation that we will examine in Section 3.

In this squib, we complicate the empirical picture even further by exploring the implications of a hitherto neglected set of facts involving multiple pre-subject modals for the analysis of Mandarin modal constructions:

- (6) **yinggai keneng** ta erzi shou shang le  
should may 3.SG son receive injury SP  
'It should be the case that his son may have become injured.'
- (7) **keneng bixu** women yiqi gongzuo le  
may must 1PL together work SP  
'It may be the case that we must work together now.'
- (8) **yinggai dei** Huang laoshi shuo hua le  
should must Huang teacher say speech SP  
'It should be the case that Teacher Huang must speak now.'

These facts are significant for several reasons. The data considered in Lin's (2012) impressive study of Mandarin multiple-modal constructions, for instance, exclusively involve multiple *post-subject* modals. This is understandable, for multiple pre-subject modal sentences will be the 'default' (i.e. base structure) under the XP-movement approach, and are hence unremarkable. Nonetheless, as we will see in Section 4, the current facts now pose a challenge to Hsu's (2019) traditional head-movement

analysis, since the pre-subject modals in a multiple-modal sentence do *retain* their base order:

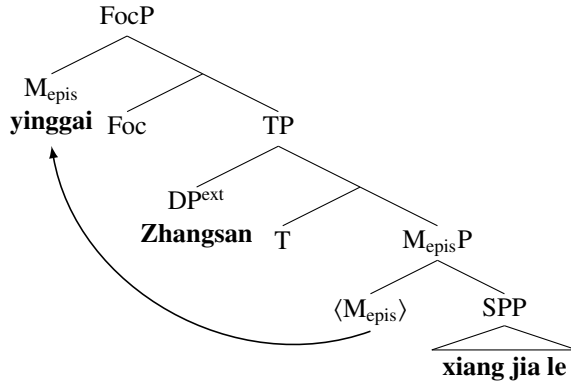
- (9) ta erzi **yinggai keneng** shou shang le  
 3.SG son should may receive injury SP  
 ‘It should be the case that his son may have become injured.’
- (10) women **keneng bixu** yiqi gongzuo le  
 1PL may must together work SP  
 ‘It may be the case that we must work together now.’
- (11) Huang laoshi **yinggai dei** shuo hua le  
 Huang teacher should must say speech SP  
 ‘It should be the case that Teacher Huang must speak now.’

We are thus presented with a conundrum: the XP-movement approach and the  $X^0$ -to-Foc<sup>0</sup> approach can each explain only a *subset* of the properties and patterns associated with Mandarin modal constructions. As a solution to this conundrum, we pursue the novel idea that multiple pre-subject modal sentences are derived via head movement to multiple SpecFocP positions (cf. Toyoshima 2001) as constrained by ‘Tucking-in’ in Richards (2001). The basic proposal will be introduced in Section 2, and the theoretical groundwork and further advantages will be discussed in Section 5.

## 2 The basic proposal

We propose that pre-subject modals, as heads, move directly from their post-subject base position to SpecFocP due to the presence of Foc<sup>0</sup> that encodesthetic focus.

- (12)  $X^0$ -to-SpecFocP approach



To our knowledge, this proposal has not been defended or even considered in previous literature. As we will show in the next two sections, the current proposal in fact holds the key to reconciling the conflicting syntactic properties which Mandarin modal sentences exhibit.

### 3 Against the XP-movement approach: focus-related properties

In this section, we present the arguments made against approaches where post-subject modal sentences are taken to be derived from pre-subject modal ones via XP-movement. These arguments are mostly based on the focus properties that the latter exhibit, first identified in Hsu (2019). In particular, we explore how these properties can adjudicate between different approaches.

#### 3.1 Pre-subject modal sentences expressthetic focus

Hsu's (2019) main motivation for taking the structure of a Mandarin modal-initial sentence to involve a focus projection is two-fold. First, Hsu observes that pre-subject modal sentences are relatively marked in Mandarin. For example, in a search of the CCL corpus (Zhan et al., 2003), only 2,549 examples out of the 92,099 retrieved sentences containing *yinggai* are found to involve a sentence-initial *yinggai*. Second, pre-subject modal sentences most readily occur in contexts that call for a *thetic focus* structure (in Lambrecht's 1994 terminology). Hence, (13b) is infelicitous in contexts such as the following when compared to (13a).

- (13) [Context: The doorbell rings.]
- a. *yinggai* Zhangsan mai pisa huilai-le  
should Zhangsan buy pizza return-PFV  
'It should the case that Zhangsan has bought pizzas and now returned.'
  - b. #Zhangsan *yinggai* mai pisa huilai-le  
Zhangsan should buy pizza return-PFV  
'Zhangsan should have bought pizzas and now returned.'
- (Hsu 2019:24, ex. (10))

It is clear that both Hsu's (2019) traditional head-movement account and our proposal can accommodate such discourse effects by assuming that the left-peripheral functional head that triggers modal displacement is associated with its focus semantics. By contrast, it is not at all clear how one might restrict the current interpretive effects *only* to pre-subject modal cases under the XP-movement approach. In particular, there is no reason why the same FocP projection cannot appear in (14b).

- (14) a. [<sub>FocP</sub> **Foc** [<sub>TP</sub> T<sub>FIN</sub> [<sub>VP</sub> *yinggai* [<sub>TP</sub> Zhangsan T<sub>FIN</sub> mai pisa huilai-le]]]]  
should Zhangsan buy pizza return-PFV  
'It should the case that Zhangsan has bought pizzas and now returned.'
- b. [<sub>FocP</sub> **Foc** [<sub>TP</sub> Zhangsan<sub>i</sub> T<sub>FIN</sub> [<sub>VP</sub> *yinggai* [<sub>TP</sub> t<sub>i</sub> T<sub>FIN</sub> mai pisa huilai-le]]]]  
Zhangsan should buy pizza  
return-PFV  
'Zhangsan should have bought pizzas and now returned.'

### 3.2 Focus intervention

Another argument against the XP-movement approach concerns the fact that Mandarin *wh*-questions cannot involve a pre-subject modal:

- (15) a. Zhangsan yinggai xihuan-guo shei ne?  
 Zhangsan should like-EXP who Q  
 ‘Who should have Zhangsan liked?’ (Hsu 2019:32, ex. (22b))  
 b. \*yinggai Zhangsan xihuan-guo shei ne?  
 should Zhangsan like-EXP who Q  
 Intended: ‘Who should have Zhangsan liked?’ (ibid.:32, ex. (23a))
- (16) a. Lisi xiangzhidao [Zhangsan yinggai xihuan-guo shei]  
 Lisi wonder Zhangsan should like-EXP who  
 ‘Lisi wonders who Zhangsan should have liked.’ (ibid.:32, ex. (24a))  
 b. \*Lisi xiangzhidao [yinggai Zhangsan xihuan-guo shei]  
 Lisi wonder should Zhangsan like-EXP who  
 Intended: ‘Lisi wonders who Zhangsan should have liked.’  
 (ibid.:32, ex. (25a))

Hsu (2019) attributes the ungrammaticality of (15b) and (16b) to the effects of focus intervention (in Beck’s 2006 sense; see also Kim 2002a,b). These effects follow directly from her as well as our proposal, since the structure of pre-subject modal sentences is hypothesised to involve a focus projection.

- (17) BECK-STYLE INTERVENTION EFFECTS  
 \*[Q-Op<sub>x</sub> ... F-Op [TP ... *wh*<sub>x</sub> ... ]]

In fact, the effects of focus intervention can also been seen elsewhere in Mandarin (see Yang 2012).

- (18) \*shi Zhangsan xihuan-guo shei?  
 FOC Zhangsan like-EXP who  
 Intended: ‘Who was *x* such that it was Zhangsan who liked *x*?’
- (19) \*lian Zhangsan dou xihuan-guo shei?  
 even Zhangsan all like-EXP who  
 Intended: ‘Who was *x* such that even Zhangsan liked *x*?’

Under the XP-movement approach, however, the contrasts in (15) and (16) become mysterious, since it remains unclear why XP-movement of the subject (whether raising or topicalisation) should be capable of nullifying focus intervention effects.

## 4 Against the traditional head-movement analysis

We now turn to the main challenges that Hsu’s (2019)  $X^0$ -to-Foc<sup>0</sup> account faces, which invokes the traditional head-movement mechanism.

#### 4.1 The absence of HMC effects

A clear prediction of Hsu's (2019) account is that modal displacement should observe locality restrictions such as the Head Movement Constraint:

- (20) HEAD MOVEMENT CONSTRAINT (HMC; Travis 1984:131)  
An  $X^0$  may only move into the  $Y^0$  which properly governs it.

Hsu demonstrates that the prediction is borne out. In particular, only the highest modal in a multiple-modal construction may appear in pre-subject position:

- (21) a. **yinggai**<sub>1</sub> Zhangsan —<sub>1</sub> **keyi** si-dian      dao  
should Zhangsan can four-o'clock arrive  
'It should be the case that Zhangsan is permitted to arrive at four o'clock.'  
(Hsu 2019:27, ex. (15a))  
b. \***keyi**<sub>1</sub> Zhangsan **yinggai** —<sub>1</sub> si-dian      dao  
can Zhangsan should four-o'clock arrive  
(ibid.:27, ex. (15b))

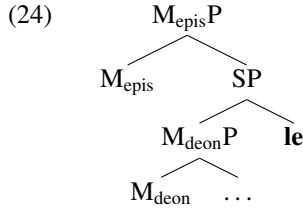
The deontic modal *keyi* may otherwise appear sentence-initially.

- (22) **keyi**<sub>1</sub> Zhangsan —<sub>1</sub> si-dian      dao  
be.allowed Zhangsan four-o'clock arrive  
'It is permitted to be the case that Zhangsan arrives at four o'clock.'  
(ibid.:27, ex. (14b))

Nonetheless, the skipping of an intervening head position is in fact *possible* in certain multiple-modal cases, a fact not noted in Hsu (2019). As a background, Erlewine (2017) reports that the sentence particle (SP) *le* scopes below epistemic but above deontic and dynamic modals:

- (23) Modals: *le* scopes above the ability modal *neng* but below the epistemic modal *keneng*  
a. Zhangsan *neng* qu Taipei *le*      [LE > ABLE; \*ABLE > LE]  
Zhangsan ABLE go Taipei LE  
Asserts: 'Zhangsan is able to go to Taipei.'  
Presupposes: 'Zhangsan was not able to go to Taipei in the immediate past.'  
(i) 'It has become the case that Zhangsan is able to go to Taipei.'  
(ii) \*'Zhangsan is able to have gone to Taipei.'  
(Erlewine 2017:49, ex. (23a))  
b. Zhangsan *keneng* qu Taipei *le*      [\*LE > MAY; MAY > LE]  
Zhangsan MAY go Taipei LE  
Asserts: 'Zhangsan may have gone to Taipei.'  
Presupposes: 'Zhangsan had not gone to Taipei in the immediate past.'  
(i) \*'Zhangsan is able to have gone to Taipei.'  
(ii) 'Zhangsan may have gone to Taipei.'  
(ibid.:49, ex. (23b))

It follows that the SP projection headed by *le* is situated between the epistemic modal and the denotc/dynamic modal projections:



Now, displacement of both an epistemic and a deontic modal to pre-subject position does *not* result in ungrammaticality:

- (25) **yinggai dei** Zhangsan qu Chengdu **le**  
 should must Zhangsan go Chengdu LE  
 ‘It should be the case that Zhangsan must now go to Chengdu.’

The well-formedness of (25) is unexpected under Hsu’s account, since its derivation would accordingly involve the skipping of the SP head *le* by the deontic modal.<sup>1</sup> The fact that modal displacement in Mandarin does not in fact observe the HMC thus constitutes a clear reason for doubting the traditional head-movement approach.<sup>2</sup>

#### 4.2 The problem of multiple pre-subject modals

Hsu’s (2019) account is further challenged by the the availability of multiple pre-subject modals. Given the highly local nature of head-movement operations, the fact that more than one pre-subject modal may appear is problematic. Our canonical examples are reproduced below:

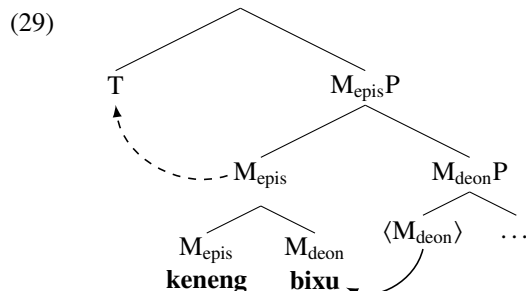
- (26) **yinggai keneng** ta erzi shou shang **le**  
 should may 3.SG son receive injury SP  
 ‘It should be the case that his son may have become injured.’
- (27) **keneng bixu** women yiqi gongzuo **le**  
 may must 1PL together work SP  
 ‘It may be the case that we must work together now.’
- (28) **yinggai dei** Huang laoshi shuo hua **le**  
 should must Huang teacher say speech SP  
 ‘It should be the case that Teacher Huang must speak now.’

<sup>1</sup> As (24) should make clear, the current argument is independent of one’s assumptions about the exact status of the sentence particle *le* (whether it is in the vP-region as Erlewine 2017 argues, or in the CP-region as Paul 2014 argues, among others). We are aware of the debate, and will leave the issue open.

<sup>2</sup> The contrast seen in (21) also directly falls under our proposal (see Section 5 for discussion).



Under the traditional head-movement analysis, the only viable way to generate sentences like (26)–(28) is to assume that a Mandarin modal can freely adjoin to any higher modal to form an  $X^0$ -complex.<sup>3</sup>



There are at least two problems with such an analysis. The first problem is that the movement seen in (29) goes against the commonplace assumption that Mandarin head movement always involves left-adjunction (Lin 2001; Paul and Whitman 2010; Huang 2015; see also Kayne 1994 for a theoretical proposal that head-adjunction can only be to the left). Even in the case of verb–object compounds, whose formation involves head movement when disyllabic compound components are involved (Author 2016), the N–V order is observed:

- (30) a. menpiao shoumai yuan                      b. \*shoumai menpiao yuan  
       ticket sell person                        sell ticket person  
       'ticket seller'
- (31) a. jiaqin siyang chang                      b. \*siyang jiaqin chang  
       poultry feed yard                        feed poultry yard  
       'poultry-feeding yard'

The second problem is that the modal complex thus formed in (29) does not in fact behave as an  $X^0$ -unit, as the coordination test indicates:

- (32) keneng [[bixu mei-ge ren dou canjia kaoshi], erqie [bixu mei-ge  
       may must every-CL person all attend exam and must every-CL  
       ren dou na yi-bai fen]] le  
       person all get one-hundred mark SP  
       'It may be the case that everyone must take the exam, and that everyone must  
       get 100 marks.'

<sup>3</sup> The question of whether the so-called epistemic modals are in fact adverbs is not new. In fact, Lin (2012) also faces the same question from a reviewer who questions the status of epistemic modals, and devotes an entire section to addressing the question. Chou (2013), who adopts the same assumption as Lin's, also addresses a similar concern in a footnote. We refer the interested reader to Lin (2012, section 4) and Chou (2013, footnote 7) for further discussion on why epistemic modals are not adverbs.



We therefore propose that the derivation of a Mandarin pre-subject modal sentence involves Internal Merge of  $X^0$  to a specifier of FocP. What is most interesting to note is that under the current slight shift of perspective, the existence of Mandarin sentences that involve multiple pre-subject modals is immediately *expected*. An example derivation is shown below.

- (36)
- 
- Syntax tree for the sentence "yinggai dei Huang laoshi shuo hua" (The teacher must have said). The root is FocP, branching into M<sub>epis</sub> (yinggai) and a TP complement. The TP branches into M<sub>deon</sub> (dei), Foc, and a DP<sub>subj</sub> complement. The DP<sub>subj</sub> branches into T (Huang) and an M<sub>epis</sub>P complement. The M<sub>epis</sub>P branches into <M<sub>epis</sub>> and an SPP complement. The SPP branches into M<sub>deon</sub>P and an SP complement. The M<sub>deon</sub>P branches into <M<sub>deon</sub>> and a vP complement. The vP branches into a trace (represented by a triangle) and the verb "shuo hua". Arrows indicate movement from the trace to <M<sub>deon</sub>>, from <M<sub>deon</sub>> to <M<sub>epis</sub>>, and from <M<sub>epis</sub>> to yinggai.

<sup>4</sup> In fact, this is not the typology of movements that Arregi and Pietraszko (to appear) propose, but nonetheless suffices for current purposes.



This idea, known as Tucking-in, thus guarantees that the resulting order after movements will exactly resemble the pre-movement order of  $\alpha$  and  $\beta$ . Importantly, Richards indeed intends Tucking-in to constrain multiple-specifier structures *created by movement*. As expected, the following base example is ungrammatical (again, *yinggai* should be construed as an epistemic modal):

- (41) \*Huang laoshi dei yinggai shuo hua le  
 Huang teacher must should say speech SP

The fact that modal displacement in Mandarin should observe the Tucking-in condition, hence, constitutes yet another argument for the proposed Head-to-Spec analysis.

### 5.3 Interpretive properties of pre-subject modal sentences captured

It is also important to note that the current proposal preserves all the core strengths of Hsu's (2019) inspiring analysis. In our account, modal displacement to a pre-subject position is likewise triggered by the left-peripheral  $\text{Foc}^0$  just as in Hsu's analysis (recall (36)). Accordingly, the structure of a pre-subject modal sentence will necessarily involve a focus projection whose head can be held responsible for the additional interpretive properties we observe with this kind of modal sentence that remain unaccounted for under the XP-movement approach. As should by now be clear, our novel proposal thus succeeds in removing the major obstacles facing the traditional 'head movement' approach.

## 6 Conclusion

In this squib, we proposed  $\text{M}^0$ -to-SpecFocP movement as the mechanism for the derivation of single and multiple pre-subject modal sentences, building on the  $\text{M}^0$ -to-Foc<sup>0</sup> approach of Hsu (2019). The primary reason why a head-movement approach has rarely been pursued in the existing literature might well be that the traditional conception of head movement imposes locality restrictions (HMC) and directionality of adjunction requirements (left-adjunction in Mandarin) that are too stringent even for descriptive adequacy. The current head-to-spec movement approach offered a novel solution to the recalcitrant problem by combining the advantages of traditional head-movement approach in accounting for focus-related effects and those of the XP-movement approach in having relaxed locality constraints and in generating the requisite surface order. This is a result which no previous analysis of Mandarin modals can achieve. On the whole, the current analysis provides additional evidence for distinguishing syntactic head movement from post-syntactic head movement as recently discussed in Harizanov and Gribanova (2019), and for positing head-to-spec movement as in Toyoshima (2001) and others.

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