Moving heads to specifiers

Evidence from Mandarin multiple pre-subject modals

Jackie Yan-Ki Lai · Haoming Li

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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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.
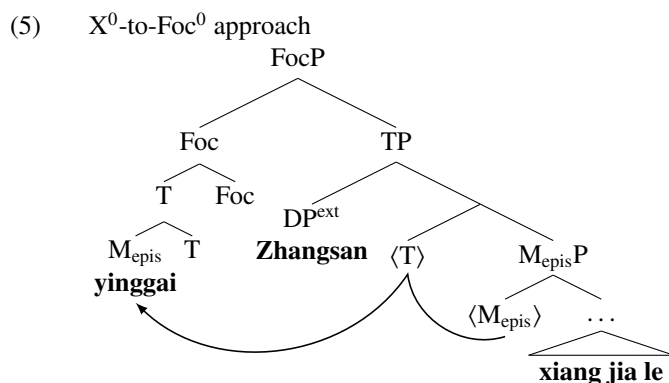
(2)   XP-movement approach
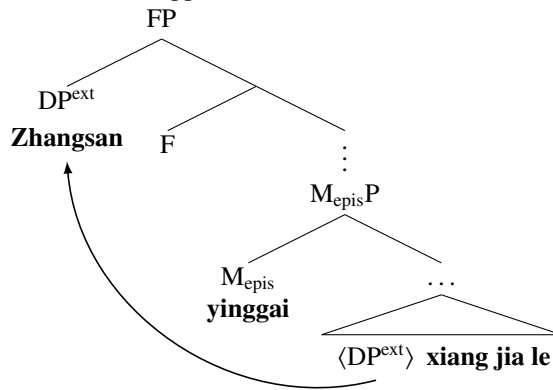
Few studies, however, have argued for a head-movement approach to pre-subject modal sentences like (1a), perhaps due to the fact that multiple modals may also appear in pre-subject or post-subject position of a Mandarin sentence. Notably, Lin (2012), which extends the theory proposed in Lin (2011), offers 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$_i$ T$_{FIN}$ [$_{VP}$ keneng [$_{TP}$ t_i T$_{FIN}$ [$_{VP}$ keyi   [$_{TP}$ PRO$_i$ T$_{NONFIN}$
       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$_i$ Top [$_{M_{epis}P}$ keneng [$_{TP}$ t_i T [$_{M_{deon}P}$ 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^0-position (more specifically, Foc^0):

(5) X^0-to-Foc^0 approach

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^0 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^0 that encodes thetic focus.

(12) X^0-to-SpecFocP approach
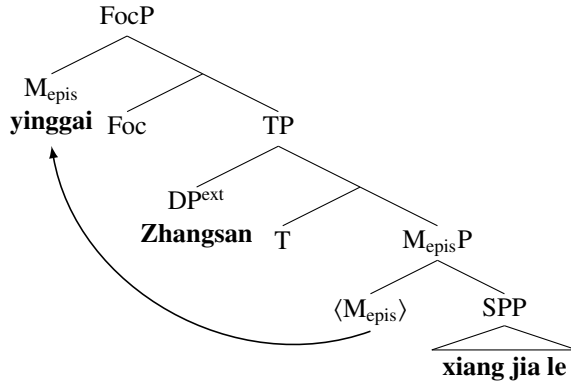
To our knowledge, this proposal has not been defended or even considered in previous literature. As we will show in the next two sections, the current proposal in fact holds the key to reconciling the conflicting syntactic properties which Mandarin modal sentences exhibit.

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 express thetic 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 as the reply to a wide-focus question when compared to (13B).

(13)   [Context: Both A and B hear the doorbell ringing.]
   A: zenme le?
      how SP
      'What happened?'
   B: 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. [$_{\text{FocP}}$ **Foc** [$_{\text{TP}}$ T$_{\text{FIN}}$ [$_{\text{VP}}$ yinggai [$_{\text{TP}}$ Zhangsan T$_{\text{FIN}}$ mai pisa   huilai-le]]]]
               should   Zhangsan   buy pizza return-PFV
     'It should the case that Zhangsan has bought pizzas and now returned.'
   b. [$_{\text{FocP}}$ **Foc** [$_{\text{TP}}$ Zhangsan$_{\text{i}}$ T$_{\text{FIN}}$ [$_{\text{VP}}$ yinggai [$_{\text{TP}}$ t_{i} T$_{\text{FIN}}$ mai pisa
           Zhangsan   should   buy pizza
     huilai-le]]]]
     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$_x$ ... F-Op [$_{TP}$ ... *wh*$_x$ ...]]

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^0 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**$_1$ Zhangsan __$_1$ **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**$_1$ Zhangsan **yinggai** __$_1$ 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**$_1$ Zhangsan __$_1$ 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 Taibei 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 Taibei 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 epistmic modal and the denotic/dynamic modal projections:

(24)

$$M_{epis}P$$

M_{epis} SP

$M_{deon}P$ **le**

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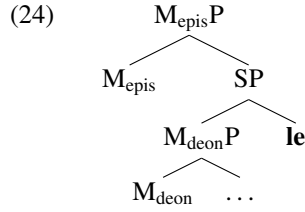
Now, displacement of both an epistemic and a deontic modal to pre-subject position does *not* result in ungrammaticality:

(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.[1] 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.[2]

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.'

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[1] 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 *v*P-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.

[2] 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.[3]

(29)
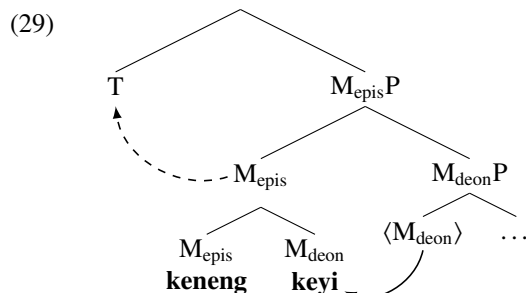
There are at least two problems with such an analysis. The first problem is that the movement seen in (29) goes against the commonplace assumption that Mandarin head movement always involves left-adjunction (Lin 2001; Paul and Whitman 2010; Huang 2015; see also Kayne 1994 for a theoretical proposal that head-adjunction can only be to the left).

The second (more severe) problem is that there is simply no reason to suppose that Mandarin modals like *keneng* can trigger head movement—they lack affixal properties, and may serve as standalone answers themselves.

(30) A: Lisi keneng daoqian ma?
    Lisi may apologise Q
    'May it be the case that Lisi apologises?'
  B: keneng
    may
    'Yes, it may.'

In contrast, typical instances of head movement often effectuate word formation (see Harley 2013 for an overview).

(31) a. If he had telephoned her, ...
  b. Had-∅ he telephoned her, ...
  c. *{If had / had if} he telephoned her, ...

4.3 Interim summary

We thus run into a conundrum: different considerations seem to support different approaches towards the syntax of Mandarin modal sentences. In the next section, we

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[3] 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.

will demonstrate that this conundrum is not insurmountable, especially in light of recent advances in our theoretical understanding of the nature of head movement.

5 Towards a solution: Head-to-Spec movement

Our solution to the conundrum builds on Harizanov and Gribanova's (2019; hereafter 'H&G') recent proposal that there are in fact two distinct classes of phenomenon that fall within the the traditional realm of head movement, which should be captured by distinct grammatical operations. Many instances of what is previously described as head movement in fact involve *postsyntactic amalgamation*. This operation produces head-adjunction structures, is morphology-driven, and cannot possibly yield any interpretive effect. On the other hand, bona fide instances of *head movement* that occurs in the syntax do not produce adjunction structure, are not driven by morphology, and may yield effects on interpretation.

It is long observed that there are instances of head movement that appear puzzling from the perspective of the HMC. For instance, verb-fronting in a number of Slavic languages, including Bulgarian participle fronting, is known to be able to skip intervening heads (Lema and Rivero 1989; Rivero 1991; Lambova 2004). At that time, such phenomena were commonly taken to counter-exemplify the HMC, and the term 'long head movement' was coined to refer to the movement operation involved in (32b).

(32)   a. šte   si   bila   **pročela** knigata   [Bulgarian]
            FUT be-2.SG been-FEM read-FEM   book-the
            'You will have read the book.'   (Embick and Izvorski 1997, ex.(30a))
        b. **pročela**₁ šte si   bila   ___₁ knigata   [Bulgarian]
            read-FEM   FUT be-2.SG been-FEM   book-the

                                                                    (ibid., ex. (30c))

However, the fact that 'head movement' should observe the HMC is also suspect from a minimalist perspective, since it does not obey the Extension Condition (Chomsky 1995), unlike other instances of narrow-syntactic movement. The main significance of H&G's shift of perspective is that there is in fact nothing inherently special about head movement per se; *genuine* instances of head movement indeed obey the Extension Condition. Accordingly, the fact that head movement should target a specifier position is completely unsurprising, and constitutes the default state of affairs (see also Toyoshima 2001; Matushansky 2006; Harizanov 2019 among others). It also follows that head movement does *not* actually observe the HMC, a requirement which only stems from misunderstandings at the time. Rather, it is postsyntactic amalgamation that is actually subject to the stringent locality requirement.

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.

(33)   yinggai dei   Huang laoshi   shuo hua   le   = (28)
            should must Huang teacher say   speech SP
            'It should be the case that Teacher Huang must speak now.'

(34)

It is worth clarifying that while X^0's are targeted for movement in (34), the two movements shown above are expected to pattern with *phrasal* movement in their behaviour, given that the same operation (i.e. Merge) is involved. Recently, Arregi and Pietraszko (to appear) argue forcefully that an ontology of movements based on movement targets (i.e. the type of moved element, which in this case is X^0) as in the traditional GB conception would lead to a number of wrong predictions (see also Hein 2018; Harizanov and Gribanova 2019). Simplifying, a more accurate ontology of movements should be defined based on the type of landing site that the movement targets, rather than the type of element targeted for movement.[4]

5.1 The absence of HMC effects explained

One advantage of the current proposal is thus that it immediately explains the absence of HMC effects. In (34), for instance, M_{deon}^0 may well cross the sentence particle *le* when it undergoes movement to SpecFocP, on a par with X^0's *not* constituting intervenors for phrasal movement.

    The data which Hsu (2019) takes to support her account, repeated below, also follow from the current system. Instead of exemplifying HMC effects, the following data are now taken to exemplify the effects of superiority.

(35)   a.   **yinggai**$_1$ Zhangsan __$_1$ **keyi** si-dian   dao   = (21a)
                  should   Zhangsan   can four-o'clock arrive
                  'It should be the case that Zhangsan is permitted to arrive at four o'clock.'
        b.   ***keyi**$_1$ Zhangsan **yinggai** __$_1$ si-dian   dao   = (21b)
                  can   Zhangsan should   four-o'clock arrive

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

It is well known that a probe can only attract the closest potential goal ('Attract Closest'). The embedded C^0 in (36), for example, can only attract the highest *wh*-phrase.
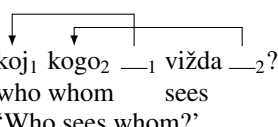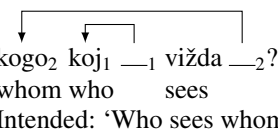
(36)   a.   she wonders who bought what
        b.   *she wonders what who bought
        c.   she wonders what he bought

5.2 The observance of Tucking-in

A question now arises as to what would constrain the relative ordering of the multiple specifiers (which come free in a minimalist system) of FocP in our account. The following sentence, where the deontic modal precedes the epistemic modal, is ungrammatical:

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

In this connection, Richards (2001) proposes that in a scenario where two syntactic objects α and β are attracted by the same probe γ (with α being higher than β), the (subsequent) movement of β must create a specifier *lower* than the specifier created by movement of α, as can be seen with Bulgarian multiple *wh*-fronting for instance:

(38)   a.   koj₁ kogo₂ __₁ vižda __₂?
              who whom   sees
              'Who sees whom?'   (Rudin 1988:472, ex. (54a))

        b.   *kogo₂ koj₁ __₁ vižda __₂?
              whom who   sees
              Intended: 'Who sees whom?'   (ibid.:473, ex. (54b))

This idea, known as Tucking-in, thus guarantees that the resulting order after movements will exactly resemble the pre-movement order of α and β. 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):

(39)   *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 Foc^0 just as in Hsu's analysis (recall (34)). 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 M^0-to-SpecFocP movement as the mechanism for the derivation of single and multiple pre-subject modal sentences, building on the M^0-to-Foc^0 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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