

Generalized Scope Economy

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Scope Economy (SE) dictates that scope-shifting operations must have semantic effects, i.e. they are licensed by crossing a quantificational element. Little has been said on whether focus can be a licenser. Meanwhile, ‘quantificational elements’ are often conflated with focused/focusing elements in the discussion of Intervention Effects (IE). This paper motivates a generalized version of SE where focused elements are also proper licensers for scope-shifting operations, unifying the range of licensers in SE and interveners in IE. We present empirical evidence from the distribution of root modals in Mandarin Chinese.

1. Introduction

Chinese root modals are generally disallowed in sentence-initial positions (i.e. they follow the subject), as in (1) (taken from T.-H. J. Lin 2011:69).

- (1) ***neng** / ***hui** / ***keyi** Zhangsan zhunbei wancan
can will can Zhangsan prepare dinner
Int.: ‘Zhangsan can/ will/ may prepare the dinner.’

However, it has been observed that root modals like *neng* ‘can’, *hui* ‘will’, *keyi* ‘can/may’ or *yinggai* ‘should’ (in deontic use), if they are in A-not-A form, can appear sentence-initially (J.-W. Lin & Tang 1995, Huang, Li & Li 2009), as in (2) (taken from T.-H. J. Lin 2011:69):

- (2) **neng-bu-neng** / **hui-bu-hui** / **ke-bu-keyi** Zhangsan zhunbei wancan?¹
can-NEG-can will-NEG-will can-NEG-can Zhangsan prepare dinner
‘Can/ will/ may Zhangsan prepare the dinner?’

The contrast constitutes a long-standing puzzle in the literature of Chinese modals and has not been received a principled explanation yet.

¹ Abbreviations used in this paper: 1 = First Person; 2 = Second Person; 3 = Third Person; CL = Classifier; FOC = Focus marker; NEG = Negation; PERF = Perfect Aspect Marker; PL = Plural; Q = Question; SG = Singular; SFP = Sentence-final Particle.

This paper argues that sentence-initial *root* modals (SIMs) are indeed a more general phenomenon which interacts with focus.² To be specific, we propose that SIMs could be derived by moving a root modal across a focused element. SIMs are not licensed by the A-not-A form *per se*, but the (subject) focus triggered by A-not-A questions. It is further argued that the movement is regulated by Scope Economy (SE) which dictates that scope-shifting operations must have semantic effects (Fox 2000). That is, the movement must alter the scopal relation of a root modal and another quantificational/focused element. While little has been said on focus in Fox (2000), the interaction of SIMs and focus provides crucial evidence for a generalized version of Scope Economy that includes the alternation of focus scope as a semantic effect. Consequently, the licensors in SE and the interveners in Intervention Effects (IE) in Rizzi's (2001, 2004) are unified, which include both quantificational and focused elements.

This paper is organized as follows. Section 2 generalizes the licensing conditions of SIMs as immediate precedence of a focused element. Section 3 proposes a movement account for SIMs where the movement is licit only when crossing a focus, and argues against alternative base-generation approaches. Section 4 motivates a generalized version of Scope Economy with the scopal relation of SIMs and focus as well as quantifiers. Section 5 concludes by pointing to the 'mirroring' roles of a unified set of licensors in SE and interveners in IE.

2. Sentence-initial root modals and focus

Modals may be dichotomized into epistemic modals and root modals (Ross 1969, Perlmutter 1971, Jackendoff 1972).³ The well-received epistemic/root distinction is manifested in Chinese as a difference in syntactic positions, where the epistemic ones may precede canonical subjects and the root ones may not (T.-H. J. Lin 2011, Tsai 2015):

(3) Root modals may not precede the subject

(***keyi**) Zhangsan (**keyi**) zhunbei wancan
 can Zhangsan can prepare dinner
 'Zhangsan may prepare the dinner.'

² The term "sentence-initial (root) modal" is adopted from Hsu (2016) for pre-subject root modals. It should be noted that it is just a convenient label instead of description. With the presence of sentential adverbials or topics, the pre-subject position of SIMs might not be necessarily sentence-initial.

³ The latter is a heterogeneous class which could (at least) be further divided as deontic modals and dynamic modals (Palmer 1986; see Portner 2009 for a finer classification). This paper focuses on deontic modals which have a raising structure instead of a control one (Wurmbrand 1999; see J.-W. Lin & Tang 1995 for Chinese modals).

(4) Epistemic modals may precede the subject

(**keneng**) Zhangsan (**keneng**) zhunbei-le wancan
 be.possible Zhangsan be.possible prepare-PERF dinner
 ‘Zhangsan is possible to have prepared the dinner.’

(T.-H. J. Lin 2011:50-51)

It is however observed that root modals could occur sentence-initially (i.e. preceding subjects), but only in certain occasions. The favorable contexts for SIMs are provided below which are generalized to be related to focus.

First, J.-W. Lin & Tang (1995:62, ft7) observed that insertion of narrow focus marker *shi* after the root modal would improve sentences like (3), as in (5). Importantly, *shi* must be associated with the subject. Association with the VP or object would yield a degradation of the sentence, as in (6).

(5) Shi-focus construction (subject)

Keyi shi **Zhangsan_F** qu Beijing
 can FOC Zhangsan go Beijing
 ‘It can be the case that it is Zhangsan who goes to Beijing.’

(6) Shi-focus construction (VP/ object)

*Keyi Zhangsan shi [**qu Beijing_F**]
 can Zhangsan FOC go Beijing
 Int.: ‘It can be the case that Zhangsan go to Beijing (but not do something else).’

The same contrast is also found in alternative questions with *haishi* which contains the focus marker *shi*, where only *subject* alternative questions are allowed:

(7) Disjunction questions with haishi (subjects)

Keyi **Zhangsan_F** haishi **Lisi_F** qu?
 can Zhangsan or.Q Lisi go
 ‘Zhangsan or Lisi, who may go?’

(8) Disjunction questions with haishi (objects)

*Keyi Zhangsan qu **Beijing_F** haishi **Taipei_F**?
 can Zhangsan go Beijing or.Q Taipei?
 Int.: ‘Beijing or Taipei, which one may Zhangsan go to?’

Similar can be said to contrastive focus by continuation in (9). The sentence is allowed only if the focus immediately follows the SIM.

(9) Contrastive continuation (subjects)

Keyi **ni**_F qu, ye keji **ta**_F qu
 can 2SG go also can 3SG go

‘It can be the case that you go or it also can be the case that he goes.’

(10) Contrastive continuation (verbs)

*Keyi ni **liuxia**_F, ye keyi ni **zou**_F
 can 2SG stay also can 2SG leave

Int.: ‘It can be the case that you stay or it also can be the case that you leave.’

This asymmetry may be achieved by stressing either the subject or the object in Northern Mandarin which gives rise to a contrastive reading.

(11) Accented subject

Keyi **ZHANGSAN**_F qu Beijing
 can Zhangsan go Beijing

‘It can be the case that it is Zhangsan (but not someone else) who goes to Beijing.’

(12) Accented object

*Keyi Zhangsan qu **BEIJING**_F
 can Zhangsan go Beijing

Int.: ‘It can be the case that Zhangsan go to Beijing (but not somewhere else).’

Second, *wh*-questions may also license SIMs. An SIM is licensed if it is immediately followed by a *wh*-phrase (as the subject in (13)), but it is disallowed if the *wh*-phrase is not immediately following the SIM, as the object in (14). Note that *wh*-phrases bear inherent focus interpretation (Rochemont 1986) and may thus form a natural class with the contrastive focus above.

(13) Wh-subject

Name, keyi [**shei**]_F mianfei qu Beijing?
 so can who free.of.charge go Beijing

‘Who may go to Beijing for free then?’

(14) Wh-object

*Name, keyi Zhangsan mianfei qu [**nali**]_F?
 so can Zhangsan free.of.charge go where

Int.: ‘Where may Zhangsan go for free then?’

Third, we observe polarity questions with the presence of a question intonation or a question particle may also license SIMs:

(15) Polarity question

Keyi Zhangsan qu Beijing {↗/ ma}? (↗ = rising question intonation)
 can Zhangsan go Beijing Q SFP.Q
 ‘May Zhangsan go to Beijing?’

It may be difficult to see how a question intonation/particle could be grouped with contrastive focus and *wh*-phrases at the first glance. We suggest that SIMs are however not licensed by the intonation or particles *per se*, but the focus triggered by them. The subject in polarity questions with SIMs receives focus, as indicated by the pre-subject position of the focus marker *shi* in (16). The incompatibility with VP focus in (16) also indicates that the question intonation/particle is not the true licenser, otherwise the SIMs should be licensed regardless of the focus position.

(16) Keyi (shi) **Zhangsan** (*shi) **qu Beijing** {↗/ ma}?

can FOC Zhangsan FOC go Beijing Q SFP.Q

a. ‘Can it be the case that Zhangsan but not someone else go to Beijing?’/

b. *‘Can it be the case that Zhangsan go to Beijing but not do something else?’

Following this line of reasoning, SIMs in A-not-A questions are indeed not licensed by the A-not-A form, but the subject focus being triggered. We observe that A-not-A form does not *always* license SIM:

(17) A-not-A questions

Lisi’s Mainland Travel Permit had expired, so that he cannot go to Beijing...

a. Ke-bu-keyi **Zhangsan** qu Beijing?

can-NEG-can Zhangsan go Beijing

‘May Zhangsan go to Beijing?’

b. *Ke-bu-keyi Lisi **qu Taibeir**?

can-NEG-can Lisi go Taipei

Int.: ‘May Lisi go to Taipei?’

While an SIM is allowed in (a), it is disallowed in (b). The difference between (a) and (b) is that the subject is focused in the former but not the latter, again pointing to focus being a crucial licensing condition but not the A-not-A form.

Some may wonder why a A-not-A question could trigger focus. A plain A-not-A question formed by verbs (V-not-V) is a non-biased (neutral) question where the speakers presumes no polarity on the answer as in (18). It could be understood as the sentence bearing a broad focus instead of a narrow one.

(18) [Context: The speaker knows nothing about Zhangsan:]

Zhangsan qu-bu-qu Beijing?

Zhangsan go-NEG-go Beijing

‘Does Zhangsan go to Beijing?’

We suggest that this question could be answered by adopting a more fine-grained typology of A-not-A questions. A-not-A questions, as proposed by Schaffar and Chen (2001) and Tsai and Yang (2015), may be divided into two types. The first type, called inner A-not-A in Tsai & Yang’s terminology, is often formed by verbs and contribute to a neutral/broad focus interpretation. The second type (outer A-not-A) is often formed by copular *shi* (or epistemic modals) and contribute to a narrow focus interpretation. (19) exemplifies different focus possibilities in the outer A-not-A questions.

(19) a. [Context: The speaker knows that Zhangsan likes only Beijing:]

Zhangsan shi-bu-shi qu **Beijing_F**? (object focus)

Zhangsan be-NEG-be go Beijing

‘Does Zhangsan go to Beijing (but not somewhere else)?’

b. [Context: The speaker knows that only Zhangsan likes Beijing:]

shi-bu-shi **Zhangsan_F** qu Beijing? (subject focus)

be-NEG-be Zhangsan go Beijing

‘Does Zhangsan (but not someone else) go to Beijing?’

These two types of A-not-A questions are also distinguished in structural terms. Inner A-not-A questions are formed by a lower functional head located within the TP domain, while outer A-not-A questions involve a higher functional head in the CP domain (head of Pol2P in Schaffar & Chen 2001, or head of AstP in Tsai & Yang 2015). Verbs, however, are too low to move into the outer A-not-A head:

(20) *Qu-bu-qu Zhangsan_F Beijing?

go-NEG-go Zhangsan Beijing

‘Does Zhangsan (but not someone else) go to Beijing?’

We suggest that A-not-A questions formed by SIMs (= (2) & (17)) are outer A-not-A questions carrying a higher functional head in CP domain. The outer A-not-A head is responsible for the narrow focus interpretation.

Building on the distribution of focus in (#1) contrastive contexts, (#2) *wh*-questions and (#3) polarity questions (including A-not-A questions), we generalize the licensing condition of SIMs as (21):

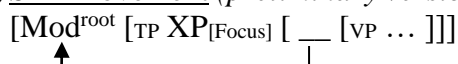
(21) SIMs are licensed if the element immediately following them receives focus interpretation.

3. Towards a movement approach

3.1. Proposal

Following Tsai (2015), we retain the classic treatment that root modals (e.g. *keyi* ‘can/may’, deontic *yinggai* ‘should’) are base-generated below Spec TP (i.e. they are lower than the subject), and propose that SIMs can undergo head movement only when it crosses a focus, diagrammed in (22):

(22) SIM movement (*preliminary version*)



This movement is not allowed if the element immediately following the root modal does not receive a focus interpretation, hence capturing the generalization in (21). Thus, the contrast in (1) and (2) (reproduced below) can be attributed to whether the SIM moves across a focus.

(23) ***neng** / ***hui** / ***keyi** Zhangsan zhunbei wancan
 can will can Zhangsan prepare dinner
 Int.: ‘Zhangsan can/ will/ may prepare the dinner.’

(24) **neng-bu-neng** / **hui-bu-hui** / **ke-bu-keyi** Zhangsan_F zhunbei wancan?
 can-NEG-can will-NEG-will can-NEG-can Zhangsan prepare dinner
 ‘Can/ will/ may Zhangsan prepare the dinner?’

(23) is a plain declarative clause with no context triggering subject focus. *Keyi* ‘can’ thus cannot move from the TP-internal position across the non-focused subject to the sentence-initial position. (24) is an outer A-not-A question with a higher functional head in the CP domain to trigger a subject narrow focus. The movement of *keyi* is made licit by crossing the focused subject. *Keyi* further fuses with the A-not-A head to form *ke-bu-keyi*.⁴ The relevant derivations for this pair are given in (25) and (26) respectively.

(25) ***[keyi** [TP Zhangsan_[-Focus] [_ [VP prepare dinner]]]

(26) [A-not-A **[keyi** [TP Zhangsan_[Focus] [_ [VP prepare dinner]]]]

⁴ Note that it is *not* obligatory for the SIM to fuse with the A-not-A head, as shown below:

(i) [Shi-bu-shi [keyi Zhangsan_[Focus] _ [zhunbei wancan]]] ?
 be-NEG-be can Zhangsan prepare dinner
 ‘Is it the case that it is Zhangsan that may prepare dinner?’

This strongly supports that A-not-A form *per se* is *not* the licenser for SIMs.

It should be clarified that the proposed movement is not a focus-triggering operation, rather, it is licensed by crossing a focus. The exact mechanism of licensing will be introduced in Section 4. The movement of root modals does not trigger any focus nor create any focus position and should be carefully distinguished with clefting or other focus movement (e.g. *lian* ‘even’ focus and object shift in Mandarin Chinese), which may involve movement of the focused element itself.

Our movement account in (22) derives a subject-object asymmetry where a focused subject can license SIMs while a (in-situ) focused object cannot. Moreover, (22) predicts that an object undergone focus movement may license an SIM if the object is immediately following the SIM. The prediction is borne out:

(27) Object focus movement with SIMs

- a. Jingran keyi **lian** **GB** na-ge-laoshi dou bu-jiao, zhen lipu!
 unexpectedly can even GB that-CL-teacher also NEG-teach really unacceptable
 ‘How could that teacher not teach GB (Government & Binding theory)! That’s insane!’
- b. *Jingran keyi na-ge-laoshi **lian** **GB** dou bu-jiao, zhen lipu!
 unexpectedly can that-CL-teacher even GB also NEG-teach really unacceptable
- c. *Jingran **lian** **GB** keyi na-ge-laoshi dou bu-jiao, zhen lipu!
 unexpectedly even GB can that-CL-teacher also NEG-teach really unacceptable

3.2. *Variable landing sites*

The landing site of SIMs is variable. An SIM may move to a position right above Spec TP yet below the topic (presumably below TopicP on a cartographic clausal spine):

(28) SIMs follow the topic

- a. [Zhe-jian-dangao]_t, Zhangsan_F **yinggai** chi *t* (, bu shi ni_F)
 this-CL-cake Zhangsan should eat NEG be 2SG
- b. [Zhe-jian-dangao]_t, **yinggai** Zhangsan_F chi *t* (, bu shi ni_F) (SIM)
 this-CL-cake should Zhangsan eat NEG be 2SG
- (a)-(b): ‘This cake, it is Zhangsan that should eat (but not you).’

An SIM may also move to a pre-topic position. We have already seen that SIMs may precede a pre-subject *lian* ‘even’ focus in (27)a. (29) with a *wh*-object topic illustrates the same.

(29) SIMs precede the topic

- a. Name, [na-ge-pinpai]_F_t women **yinggai** yao yongyuan bu mai *t* ?
 so which-CL-brand 1PL should should ever NEG buy
- b. Name, **yinggai** [na-ge-pinpai]_F_t women yao yongyuan bu mai *t* ? (SIM)
 so should which-CL-brand 1PL should ever NEG buy
- (a)-(b): ‘So, which brand should we never buy?’

It is noteworthy that however far SIMs can move, they cannot move across an epistemic modal such as *keneng* ‘be.possible’:

(30) SIMs follow epistemic modals

- a. Keneng **keyi** ni_F qu (, bu-yiding yao ta qu)
 be.possible can 2SG go NEG-must should 3SG go
 ‘It is possible that it is you (but not necessarily he) that may go.’
- b. ***Keyi** keneng ni_F qu (, bu-yiding yao ta qu)
 can be.possible 2SG go NEG-must should 3SG go
- c. ***Keyi** ni_F keneng qu (, bu-yiding yao ta qu)
 can 2SG be.possible go NEG-must should 3SG go

3.3. *Alternatives*

There have been attempts to account for SIMs without resort to movement, i.e. base-generation approach. The general ideas are to treat the pre-subject SIMs base-generated in syntax differently from their post-subject root modal use, as either epistemic modals (T.-H. J. Lin 2011) or focus operators (Hsu 2016). Let’s consider the first one. T.-H. J. Lin (2011) observes that SIMs (in A-not-A form) come with an epistemic-like reading which is otherwise absent in their low positions. This suggests that SIMs may pattern with epistemic modals in terms of positional flexibility. Note that Lin’s work concerns a broader issue of finiteness in Mandarin and he at best hints at a possible explanation to SIMs. For expository reasons, we take a stronger form of his suggestion, namely, “SIMs are epistemic modals”, and see how this approach is empirically challenged.

First, genuine epistemic modals like *keneng* ‘be.possible’ impose no restriction on the focus distribution. They may freely occur in a sentence-initial position with object focus as in (31). The sentence-initial position seems to be unmarked for canonical epistemic modals. It is then unclear that why SIMs have to be licensed by a focus immediately following them if they were epistemic modals.

- (31) *Keneng* ta shi qu-le **Beijing_F**, bu shi **Taibeif**
 be.possible 3SG FOC go-PERF Beijing NEG FOC Taipei
 ‘It is possible that he went to Beijing instead of Taipei.’

Second, root modals *neng* ‘can’ and *keyi* ‘can/may’ carry weak modal force, just as the epistemic modal *keneng* ‘be.possible’. Assuming that they bear the same existential quantifier over possible worlds and are differentiated only in modal base (Kratzer 1991), these two root modals are predicted to be synonymous with *keneng* ‘may’ in their SIM uses. This prediction is however not borne out, as shown by the contrast between (32) and (33). In (32), it is preferred for *neng* to associate with inherent ability (e.g. arms) and *keyi* to associate with permission (e.g. kids are not allowed to enter kitchens) in (a) and

(b), but not the possibility to cook. Thus, the answer concerning the absence of kitchen in (c) is infelicitous. *Keneng*, however, is merely possibility and is compatible with all the answers (a), (b) and (c).

(32) Q: **neng-bu-neng/ ke-bu-keyi** Zhangsan zhunbei wancan?
 can-NEG-can can-NEG-can Zhangsan prepare dinner
 ‘Can/ may Zhangsan prepare the dinner?’

A: (a) No, his arm is broken. (preferred for *neng*)
 (b) No, he is just a kid. (preferred for *keyi*)
 (c) %No, there is no kitchen in the house at all.

(33) Q: **ke-bu-keneng** Zhangsan zhunbei wancan?
 be.possible-NEG-be.possible Zhangsan prepare dinner
 ‘Is it possible that Zhangsan prepares the dinner?’ ≠ (32)

A: (a) No, his arm is broken. (preferred for *neng*)
 (b) No, he is just a kid. (preferred for *keyi*)
 (c) No, there is no kitchen in the house at all.

The same problem arises with *yinggai* ‘should’, which has both epistemic and deontic uses. It is predicted to be disambiguated at sentence-initial position under T.-H. J. Lin’s proposal, contrary to the ambiguity shown in (34).

- (34) a. **Yinggai**^{Epistemic} Zhangsan bu lai (, ta shengbing le)
 should Zhangsan NEG come 3SG be.sick SFP
 ‘It should be the case that Zhangsan will not come. (He is sick.)’
 b. **Yinggai**^{Deontic} Zhangsan bu lai (, bu yinggai ni bu lai)
 should Zhangsan NEG come NEG should 2SG NEG come
 ‘It is Zhangsan that should not come (but not you).’

Another piece of evidence supporting the difference between SIM *yinggai* and epistemic *yinggai* comes from modal stacking. As observed by T.-H. J. Lin (2012:157) in (35), epistemic *yinggai* (necessity) precedes *keneng* (possibility), but not the other way round.

- (35) a. Zhangsan **yinggai**^{Epistemic} keneng lai
 Zhangsan should be.possible come
 ‘It should be the case that Zhangsan is possible to come.’
 b. *Zhangsan keneng **yinggai**^{Epistemic} lai le
 Zhangsan be.likely.to should come SFP

Yet, SIM *yinggai* may follow *keneng* as in (36). This suggests that the syntactic position of SIM *yinggai* is lower than epistemic modal *keneng* as well as epistemic *yinggai*.

- (36) a. Keneng **yinggai**^{Deontic} ta_F cai shi diren
 be.possible should 3SG really be enemy
 ‘It is possible that he (but not someone else) should be the enemy.’
- b. ***Yinggai**^{Deontic} keneng ta_F cai shi diren
 should be.possible 3SG really be enemy
- c. ***Yinggai**^{Deontic} ta_F keneng cai shi diren
 should 3SG be.possible really be enemy

To retain the epistemic/root interpretative differences, another way is to treat SIMs as *verum focus operators* base-generated in the CP domain (Hsu 2016). This also give rises to the narrow focus interpretation in SIM sentences. Hsu’s major argument comes from the intervention effect displayed by *wh*-phrases.

- (37) *Yinggai Zhangsan mai **shenme** ne? (Hsu 2016:263)
 Should Zhangsan buy what SFP.Q
 Int.: ‘What should Zhangsan buy?’

She suggests that (37) is disallowed because *yinggai* is intervening between the Q-operator (above SIM) and the *wh*-object (below SIM). Her proposal, however, wrongly predicts SIMs with *wh*-subjects ((13) above & (38) below) to be ungrammatical.

- (38) Yinggai **shei**_F qu?
 should who go
 ‘Who should go?’

Under our movement analysis, (37) is disallowed on the same ground as (1)/(23) and (14), where *Zhangsan* is not (and cannot be, in this case,) focused, while (13) and (38) are allowed since *wh*-phrases bear inherent focus. The subject-object asymmetry is a natural consequence of our proposal. Hence, Hsu’s proposal is untenable either.

In the next section, we will discuss why the movement of SIMs needs to be licensed by focus, i.e. what is the exact mechanism that regulates the licensing condition of SIM movement.

4. Generalized Scope Economy

4.1. Alternation of focus scope with modals

To answer why focus may license modal movement, we first note that movement of an SIM across a *focused* element has semantic effects. Consider the pair below:

- (39) #*Shi shangdi*_F *keyi zhengjiu ni, suiran wo bu xin shangdi cunzai*
 FOC God can help 2SG although 1SG NEG believe God exist
 Int.: ‘God (but not someone else) may help you, though I don’t believe God is here.’
- (40) *Keyi shi shangdi*_F *zhengjiu ni, suiran wo bu xin shangdi cunzai*
 can FOC God help 2SG although 1SG NEG believe God exist
 ‘God (but not someone else) may help you, though I don’t believe God is here.’

Before movement, (39) presupposes the existence of the focused subject ‘God’ and is infelicitous with a contradicting continuation, while this presupposition is removed after movement (= (40)). Adopting a quantificational analysis of focus (Chomsky 1971, Larson & Lefebvre 1991), focus contains an existential quantifier and the presuppositional difference may be explained by the alternation of scopal relation between the existential quantifier and the root modal.

4.2. Scope Economy

We argue that SIM movement is regulated by Scope Economy (SE) (Fox 2000). SE dictates that scope-shifting operation must have semantic effects. Put differently, the grammar prohibits any vacuous operations. For example, quantifier-raising (QR) can be applied only if the inverse scope and surface scope are semantically distinct (e.g. different in truth conditions).

While QR is covert in many languages, overt movement may also be constrained by SE. Take aspectual verbs in Cantonese (one of the major Chinese varieties) as an illustration. Aspectual verb *hoici* ‘begin’ may overtly move across a quantifier, e.g. the restrictive quantifier ‘only’ in (41), but not a definite expression in (42) (Lee 2019:1-2).

- (41) a. Dak Aaming hoici haau-dou hou singzik (only>begin / *begin>only)
 only Aaming begin get-able good result
 ‘Only Aaming is such that he begins to get good results.’
- b. **Hoici** dak Aaming haau-dou hou singzik (*only>begin / begin >only)
 begin only Aaming get-able good result
 ‘It begins to be that case that only Aaming is getting good results.’
- (42) a. Aaming hoici haau-dou hou singzik
 Aaming begin get-able good result
 ‘Aaming begins to get good results.’
- b. ***Hoici** Aaming haau-dou hou singzik
 begin Aaming get-able good result

Crucially, (a) and (b) in (41) differ in truth conditions. Since both the restrictive quantifier and *hoici* are quantificational elements and are scopally informative/uncommutative (i.e. inverse scope \neq surface scope) with each other, movement of *hoici* across ‘only Aaming’ has semantic effects and is thus possible. Definite expressions such as proper names, however, generally do not interact with other quantifiers to give different truth conditions and are scopally uninformative/ commutative with quantificational elements. *Hoici* thus fails to move across ‘Aaming’ (also see Szabolcsi 2009 for a similar use of ‘begin’ in Hungarian).

The same can be said to root modals, too. Modals are quantifiers over possible worlds (Kratzer 1991). The scopal interaction of them with other quantifiers may give rise to different interpretations. This explains why root modals may move across a restrictive quantifier (which also gives a restrictive focus interpretation at the same time) in (43) but not a proper name in (44).

- (43) a. Zhiyouxuesheng **keyi** lai (only>can / *can>only)
 only students can come
 ‘Only students may come.’ (i.e. non-students cannot come.)
 b. **Keyi** zhiyouxuesheng lai, (ye keyizhiyou laoshi lai) (*only>can / can>only)
 can only students come also can only teacher come
 ‘It can be the case that only students come (, or that only teachers come).’
 (i.e. non-students may also come) \neq (a)
- (44) a. Zhangsan **keyi** lai
 Zhangsan can come
 ‘Zhangsan may come.’
 b. ***Keyi** Zhangsan lai (without subject focus)
 can Zhangsan come

In (43), the truth conditions for (b) is different from (a) after the movement *keyi* across ‘only students’. While (a) prohibits non-students from coming, (b) simply allows for a situation that only students come. It is compatible with a scenario that only teachers come, as the continuation indicated. This could be explained if the movement alters the scope relation between the restrictive quantifier and the root modal.

It is now clear that why focus could be a major licensing condition for SIMs. Both SIMs and focus are scope-bearing elements and their scopal interaction licenses SIM movement. If the focus is not on the path of SIM movement (e.g. in-situ object focus), the inverse scope remains the same with the surface scope, leading the derivation to crash (SE not satisfied). This explains why there must be a focus immediately following SIMs.

The interaction of focus and root modals also motivates a focus-sensitive SE. The original formulation of SE in Fox (2000) has said little on the role of focus. With evidence from SIMs, we propose a generalized version of SE in (45), which recognizes interaction with focus scope as semantic effects.

(45) Generalized Scope Economy (GSE)

[X ... [... Y_[Quantificational/ Focus] ... [... <X> ...]]],

↑
 where X is a scope-bearing element and Y is a *quantificational* or *focused* element and X and Y are scopally informative/ uncommutative for licit X-movement.

Our proposal for SIM movement could thus be refined as (46) to accommodate quantificational elements (e.g. restrictive quantifiers) beside focus and incorporate GSE:

(46) SIM movement (final version)

[Mod^{root} [TP/ TopicP XP_[Quantificational/ Focus] ... [___ [VP ...]]] (regulated by GSE),

↑
 where the movement must have semantic effects.

5. Concluding remarks

This paper attempted to solve a long-standing puzzle for Chinese modals, that is, A-not-A questions may mysteriously license an otherwise ungrammatical sentence-initial root modals in pre-subject position. It is argued that A-not-A licensing is actually just the tip of the iceberg. SIMs represent a broader phenomenon related to focus and quantificational elements in general. Specifically, SIMs are licensed by a quantificational or focused element immediately following them. In the case of (outer) A-not-A questions, a higher A-not-A head in the CP domain triggers narrow focus which may license SIMs. Thus, it is not the A-not-A form *per se* that licenses SIMs, but the (subject) focus triggered.

We further proposed that root modals may undergo movement across a quantificational or focused element to a higher position, yielding a wide scope reading of modals that is otherwise absent. Following the spirit of Scope Economy (Fox 2000), we suggest that the movement is constrained by scopal informativity, i.e. only movement with semantic effects is licit. This provides a principled explanation to why there must be a focused (or quantificational) element on the movement path of SIMs. This also motivates a *generalized* version of Scope Economy, which dictates that movement must have semantic effects with alternation in focus scope recognized.

A broader consequence of incorporating focus into Scope Economy is that it points to different roles of the same set of elements in syntax. Quantificational and focused elements not only license syntactic dependencies, but they also interrupt them. Particularly, they may trigger Intervention Effects (IE), such as *wh*-movement (Rizzi 2001, 2004). In Rizzi's formulation of Relativized Minimality, both quantificational and focused elements belong to a bigger 'Qu(antificational)' class. They may intervene between a dependency formed by the same class of [Qu] elements. Notably, the set of [Qu] interveners in IE is the same as the set of licensors in the proposed version of SE.

They thus play entirely different roles in IE and SE: while they may *intervene* movement by IE, they may *license* movement by SE. An interesting issue for future research is why they may have such ‘mirroring’ roles, and furthermore, whether it would provide hints on the potentially distinct nature of the syntactic dependencies being licensed and being interrupted.

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