The Interaction Between Modals and SFPs in Mandarin Chinese: A Cartographic Approach

Liching Livy Chiu
National Taiwan University

Abstract

Both sentential final particles (SFPs) and high modals commonly convey the speakers' knowledge of the world, their judgments, intentions, and subjective attitudes. This paper aims to explore the correlations between high modals and sentence-final particles in Mandarin Chinese (MC). Specifically, two high modals of MC show the behavior of being unable to precede the subject and eliminating their epistemic reading in the presence of SFPs. The phenomenon discussed in this paper is specifically exemplified with *yinggai* 'should' and *keneng* 'be likely to' in MC. We give an analysis about which modals and SFPs are interlaced in terms of their scope positions, so as to explain the phenomena.

Keywords

modals, sentential final particles, force, cartography

1 Introduction

1.1 The issue

The main discussion of this study starts with two observations about the epistemic modals (also called high modals). High modals in Mandarin Chinese (MC) could be found in two different positions, either following the subject or preceding the subject, as shown in the case of *keneng* ‘be likely to’ in (1). (1a) demonstrates that the modal *keneng* ‘be likely to’ follows the subject *Zhangsan* in a grammatical sentence; while in (1b), *keneng* ‘be likely to’ precedes its subject *Zhangsan*. Both of the modals *keneng* ‘be likely to’ here are grammatical and are interpreted as epistemic reading as indicated in the superscript E.

- (1) a. 張三可能（會）參選下一任市長。
 Zhangsan keneng^E (hui) canxuan xia-yi-ren shizhang.
 Zhangsan might will join.election next-one-CL mayor
 ‘It is possible that Zhangsan will run for the next election of mayor.’
 b. 可能張三（會）參選下一任市長。
 Keneng^E Zhangsan (hui) canxuan xia-yi-ren shizhang.
 possibly Zhangsan will join.election next-one-CL mayor
 ‘It is possible that Zhangsan will run for the next election of mayor.’

But firstly, an alternate of (1b) above would not be grammatical in the presence of a sentential final particle (SFP). (2b) has both the sentence-initial high modal *keneng* ‘be likely to’ and the SFP *ma*. In other words, example (2) illustrates a different pattern that results from the influence of the SFP *ma*. A comparison between (1) and (2) shows that a sentence with sentence-initial epistemic modal is not acceptable in yes/no questions. (2b) is ungrammatical here.

- (2) a. 張三可能（會）參選下一任市長嗎？
 Zhangsan keneng (hui) canxuan xia-yi-ren shizhang ma?
 Zhangsan be-likely-to will join.election next-one-CL mayor SFP
 ‘Is it possible that Zhangsan will run for the next election of mayor?’
 b. *可能張三（會）參選下一任市長嗎？
 *Keneng Zhangsan (hui) canxuan xia-yi-ren shizhang ma?
 possible Zhangsan will join.election next-one-CL mayor SFP
 c. ?可能*（是）張三（會）參選下一任市長嗎？
 ?Keneng *(shì) Zhangsan (hui) canxuan xia-yi-ren shizhang ma?
 possible BE Zhangsan will join.election next-one-CL mayor SFP

One might suggest that in (1b), *Zhangsan* is the contrastive topic.¹ It means that someone will run for the election, and it might be *Zhangsan*. So, the ungrammaticality of example (2b) can be attributed to a conflict between the affirmativeness of a presupposed proposition (someone will run for the election) and the doubtfulness

1 Thanks to an anonymous reviewer who proposed that there are differences in meaning between (1a) and (1b). Example (1a) shows that it is possible that *Zhangsan* will run for the next election of mayor, while (1b) means that it is possible that *Zhangsan*, instead of others, will run for the next election of mayor.

of it (whether the proposition is true or false), which are concurrent. However, what involves a contrastive topic should be as illustrated in (2c), where a focus marker “*shi*是” is obligatorily available. The sentence means that ‘someone will run for the next election of mayor, and is it possible that the candidate will be Zhangsan?’ The grammaticality for this sentence is much improved. Thus, the difference between the two alternates in (1) does not include the contrastive-focus interpretation, which sometimes repairs ungrammaticality of a sentence.

Likewise, a modal which appears in the sentence-initial position also results in ungrammaticality when a *wh*-question formation is present in the same sentence. Here in the examples of (3), there is a modal *keneng* ‘be likely to’, which is incompatible with the question-related *wh*-element *shei* ‘who’ in the second-initial position of the same utterance, thus leading to the ungrammaticality of (3b). The pattern from (1) through (3) demonstrates that the high modals preceding their subjects are not compatible with some elements in the left cartography, like sentence-final particles, such as *ma* ‘SFP’ or *ne* ‘SFP’, or *wh*-elements. Some interactions between the two syntactically higher elements result in the bad sentences exemplified in (1) through (3).

- (3) a. 誰可能會參選下一任市長呢？
 Shei keneng hui canxuan xia-yi-ren shizhang ne?
 who be-likely-to will join.election next-one-CL mayor SFP
 ‘Who can possibly run the next mayor election?’
 b. *可能誰會參選下一任市長呢？
 *Keneng shei hui canxuan xia-yi-ren shizhang ne?
 be-likely-to who will join.election next-one-CL mayor SFP

Secondly, in both English and MC, high modals like *must/bixu* ‘must’ and *should/yinggai* ‘should’ are ambiguous between their deontic and epistemic reading.² It is marked in the superscript as D and E, respectively. However, it is found that they can be disambiguated in yes/no questions. The example in English is the aux-inversed alternate shown in (5b), while the example in Chinese is the only deontic (4b). Both (b) examples of (4) and (5) are transformed from the (a) examples of (4) and (5). Also, the epistemic readings in (4a) and (5a) are canceled, and thus not available in their (b) alternates.

2 Although (4a) has both epistemic and deontic readings, thanks to an anonymous reviewer’s words, when SFP *le* 了 is omitted, (4a) can only have the deontic reading. It might imply that semantic factor plays a role in the modal constructions. When *le* is omitted, the described event is irrealis and has not happened yet. As for the epistemic modality, it is used to indicate the speaker’s judgment on the proposition. When using *yinggai*, it means that the proposition is likely to be true. There is a semantic clash between the irrealis property of the event and the speaker’s subjective judgment. We agree that the intuition and argumentation are possible; however, as we glossed in example (4a) and (4b), *ma* should also indicate another clause typing (C-element). The alternate in (b) should not be treated equal to the alternant of “*Zhangsan yinggai^{E/D} tizao qu Jiayi*”. Besides, the issue here is obviously a universal phenomenon as shown in the English example in (5), which preempts the consideration about realis/irrealis distinction. We find this issue interesting enough for another full-article discussion, but not relevant enough to disguise our issue.

- (4) a. 張三應該提早去嘉義了。
 Zhangsan yinggai^{E/D} tizao qu Jiayi le.
 Zhangsan should early go Jiayi SFP
 i. 'It should be the case that Zhangsan has set off to Jiayi early.'
 ii. 'It has become the case that Zhangsan should set off to Jiayi early.'
- b. 張三應該提早去嘉義嗎？
 Zhangsan yinggai^{*E/D} tizao qu Jiayi ma?
 Zhangsan should early leave Jiayi SFP
 i. *'Should it be the case that Zhangsan has set off to Jiayi early?'
 ii. 'Is it the case that Zhangsan should set off to Jiayi early?'
- (5) a. John must^{E/D} leave early tonight.
 b. Must^{*E/D} John leave early tonight?
 (Drubig 2001: 11)

As shown here, only the deontic readings are possible in both of the (b) alternates in (4) and (5), while the epistemic readings are absent. The reason is that the epistemic readings of the high modals come out of the presence of the periphery elements, such as the *wh*-elements and the SFPs; the latter block the interpretation of the epistemic reading, which is supposed to be also high in the syntactic structure. For how it works among the constituents in the left-periphery, please refer to the forthcoming sections of this paper.

1.2 Organization

The content of this paper includes the following five respects. Section 2 gives a brief summary about some of the relevant and important literature. Section 3 displays the modal inconsistency in four circumstances. Section 4 is about situations where the scope-interaction between modals and SFPs are observable. And then in order to explain the pattern mentioned in Section 1, I will provide an account about an interwoven hierarchy according to the data. Section 5 discusses the residue of issues on modal and *wh*-questions. The study then would enable us to map out the cartography of the functional projections in the left-periphery. Conclusions and theoretical implications are given in the last section.

2 Literature review

2.1 Modals

According to Palmer (2001), both SFPs and high modals commonly convey the speakers' knowledge of the world, their judgments, intentions, and subjective attitudes. Different linguists have different opinions about the typology of modals. Tang and Tang (1997) suggest that the semantics of modality indicates speakers' viewpoints or mental attitudes on the propositional content of a sentence, including, alethic, epistemic, deontic, evaluative, possibility, probability, and necessity. Palmer (2001) points out that modality should be considered as the grammaticalization of a speaker's attitudes and opinions, including epistemic

(the speaker's knowledge of the world), deontic (the speaker's attitudes), and dynamic (ability or volition).

- (6) a. Nobody may be at home. (*epistemic/deontic)

On the other hand, Drubig (2001) and Butler (2003) claim that the distinction between epistemic and non-epistemic modals is in terms of the scope-interaction with negations, as shown in (6). In this example, the negation, which is attached to the subject, can only interfere with the epistemic, but not the deontic interpretation. In other words, the epistemic reading in (6) is canceled and not possible because of the structure height of the two elements. Following the same logic, an ambiguity of *yinggai* 'should' must result from the multiple positions, and be intervened by *ma* in (7a). Once *ma* in (7b) takes the wider scope and derives a yes/no question, only the lower *yinggai* 'should' could be interpreted, i.e. the deontic interpretation. As for the problem of word-order in (7), to follow Kayne (1994), we can postulate another remnant movement here; so that SFPs remain at the final position, as shown in (7b). Here the rightmost-located SFP surfaces to be sentence-final when the whole clause is moved to the initial of the sentence.³

- (7) a.

Based on previous studies and observations, epistemic *keneng* 'be likely to' is stipulated to locate lower than epistemic *yinggai* 'should', and higher than deontic *yinggai* 'should' in the left-periphery, as shown in (8) (cf. also Rizzi 1997, Rizzi 2004; McDowell 1987; Nuyts 1993; Tsai 1994; Yang 2012; Zhang 2000 etc.). Negation and *wh*-phrases are provided as evidence supporting this assumption.

3 The description here is a dominant analysis in word order of SFPs, according to most of the Chinese syntax literature.

The ranking in (8) seems to predict that three modal elements could co-occur in the same sentence; however, this possibility does not come out empirically. I suppose this is more of a semantic issue than a syntactic one. Obviously, they cannot co-occur in one utterance as in (9) only because the high *yinggai* ‘should’ is not interpretable when the meaning of the high *keneng* is also present as epistemic. Semantic conflict occurs between the two epistemic interpretations, and leads to the lack of an utterance of both high modals. Also, when both of the two *yinggai* ‘should’ appear in the same sentence, a confusion caused by the repeated PF-forms could also degrade the grammaticality of this utterance.

(8) *yinggai*_{Epistemic} >>⁴ *keneng*_{Epistemic} >> *yinggai*_{deontic}⁵

- (9) *Zhangsan *yinggai*^E *keneng*^E bu *yinggai*^D qu Taipei.
 Zhangsan should might not should go Taipei
 ‘It should be the case that it might be the case that Zhangsan should not go to Taipei.’

The relevant word-order of the three modal auxiliaries is derived by the “Transitive Law” since linear order is meant to be transitive. When Y follows X and Z follows Y, we will get a $X >> Y >> Z$ word-order following transitivity. When X precedes Y, and Y precedes Z, the same result $X >> Y >> Z$ emerges. In this case, it is not about mathematics, but about a one-dimension linear order. We have the order “*keneng*_{Epistemic} precedes *yinggai*_{deontic}” in (10) and “*yinggai*_{Epistemic} precedes *keneng*_{Epistemic}” in (11). By the Transitive Law, the only possible order between *yinggai*^E and *yinggai*^D is “*yinggai*_{Epistemic} precedes *yinggai*_{deontic}”.

- (10) 張三可能不應該去台北。
 Zhangsan *keneng*^E bu *yinggai*^D qu Taipei.
 Zhangsan might NOT should go Taipei
 ‘It might be the case that Zhangsan should not go to Taipei.’

- (11) 張三應該不可能去台北。
 Zhangsan *yinggai*^E bu *keneng*^E qu Taipei.
 Zhangsan should NOT might go Taipei
 ‘It should be the case that Zhangsan might not go to Taipei.’

2.2 Sentential final particle

After the previous introduction of modals, this section is dedicated to the literature of SFPs. Based mainly on the studies of Li and Thompson (2009), and Li (2006), I firstly introduce the core functions and meanings of the most common SFPs and summarize in the following table (Table 1).

4 The symbol “>>” indicates the relative word order in the current paper. The element on the left of >> precedes the element on the right. We can literally read the symbol “>>” as “precede”.

5 The ranking here seems to predict that the three modals could co-occur in a sequence. However, this possibility does not bear out.

Table 1 Functions and meanings of SFPs

SFP	Core function and meaning
<i>le</i>	Sentential <i>le</i> , differing from aspectual <i>le</i> , denotes a “change-of-state”, suggesting a previous state changes to the state to which the sentence ending with <i>le</i> refers.
<i>ne</i>	<i>Ne</i> is closely related to the expression of “relevance” and functions as a topic marker.
<i>ba</i>	<i>Ba</i> lowers the strength of a sentence and displays speaker’s uncertainty.
<i>a</i>	Basically, <i>a</i> reduces forcefulness of the message, as in imperatives or interrogatives.
<i>ma1</i>	<i>Ma1</i> marks a high degree of the speaker’s commitment to the assertion or the speaker’s intention to have an action fulfilled in imperative sentences.
<i>ma2</i>	<i>Ma2</i> , though controversial, is mostly analyzed as a yes-no question particle.
<i>ou</i>	<i>Ou</i> implies a friendly warning showing concern and care on the part of the speaker.

It is necessary to note that there are also a lot of discussions about the mood particles in Chinese. Tang (1998) separates SFPs in Cantonese into two types – inner and outer ones – in accordance with their structure heights. According to his account, the interpretations of the two types of particles are like (12). Law (2002) also divides SFPs in Cantonese into two groups, and further locates them in the CP domain, as in (13).

- (12) a. Inner particles: they are associated with either temporal information or focalization.
- b. Outer particles: they indicate the clause type and illocutionary force of a sentence.
- (13) a. SFP₁ (Force)-speech act and speaker-oriented modality
- b. SFP₂ (lower than higher Topic)-*zaa3* ‘only’, *tim1* ‘also/even’, *laa3* ‘inchoative’

Li (2006) claims that SFPs in MC should be divided, and be located on various functional projections in the left-periphery (14). Huang (2007) further suggests another structure as shown in (15), considering Topic and LE that interact with SFPs.

- (14) Discourse > Degree > Force > Evaluative > Mood > Fin
 啊吧， 嗎 呢
 A BA, MA NE
- (15) Degree > Force > Mood, Topic > Trans > Finite
 吧，嗎，啊，喔 嗎2 呢 了
 BA, MA1, A, OU MA2 NE LE

Pan (2019) observes more SFPs in accordance with Paul (2015)’s system and further proposes a more detailed hierarchy, as shown in (16). The low C in this model is divided into a projection related to the sentential aspect S.AspP and a projection relating to the exclusive focus particles, such as *eryi* ‘only’. We would like to mention that Pan (2019) also provides a more fine-grained distribution of the functional projections in Chinese as shown in Table 2. This is somehow in parallel with our idea of two layers of SFP projections.

- (16) (TP) < S.AspP (sentential aspect particles) < *Only*P (exclusive focus particles) < iForceP (illocutionary force) < SQP (special questions) < AttP1 < AttP2 (discourse particles related to the speaker’s attitude)

Table 2 Quoted from Pan 2019

Projections		Particles/operators	Discourse function	Embedded?
S.AspP (sentential aspect)		來著 ¹ <i>laizhel</i>	Recent past	Yes
		了 <i>le</i>	State changing	Yes
		呢 ¹ <i>nel</i>	Progressive aspect	Yes
<i>Only</i> P		而已 <i>eryi</i>	Sentential exclusive focus	Yes
iForceP (illocutionary force)		嗎 <i>ma</i>	Standard <i>yes-no</i> question	No
		吧 ¹ <i>ba1</i>	Weak imperative	No
		吧 ² <i>ba2</i>		No
		Op- <i>wh</i> (null)	Wh-question operator	No
SQP (special questions)	RheQP	Negative operator $\neg$	Rhetorical question	No
	NegQP	什麼 <i>shenme</i> / 哪裏 <i>nali</i> + $\neg$	Negative wh-question	No
AttitudeP (speaker’s attitude)	Low layer	呢 ² <i>ne2</i>	Speaker’s attitude, subjective opinion, etc.	No
	High layer	啊 ^a , 哎 ^{ei} , 喂 ^{bei} , 啦 ^{la} , 嘞 ^{lei} , 呐 ^{na} , 呀 ^{ya} , 嘛 ^{ma} , 來著 ² <i>laizhe2</i> , 吧 ³ <i>ba3</i> , etc.		No

To conclude the discussion in previous literature, six SFPs are claimed to be the fundamental particles, including MA嗎, NE呢, BA吧, A啊, LE了, and DE的. Further, specifically, MA嗎 and BA吧 are extra important in relation to their relative hierarchy with high modals.⁶ Also, in general, it is plausible to divide SFPs into two categories in accordance with their structure height, no matter what terminology they are assigned. One category is lower in association with the temporal information while the other one is higher and related with the Force domain.

3 Modal asymmetry and inconsistency

3.1 Epistemic *yinggai* ‘should’

To discuss the interpretation of high modals, it is found that in six different contexts, SFPs do interact with high modals. The six contexts are namely: Yes/no Questions, Indirect Questions, Conditionals, Wh-questions Negations, and Negative Subjects. In other words, deontic reading of the high modals in the six circumstances is preserved, while epistemic reading is no longer available. In the following (17) through (27) are the relevant data displayed.

Yes/no Questions

- (17) a. 張三應該去工作了。
 Zhangsan yinggai^{E/D} qu gongzuo le.
 Zhangsan should go work SFP
 i. ‘It should be the case that Zhangsan has gone for work.’
 ii. ‘It has become the case that Zhangsan should go to work.’
 b. 張三應該去工作了嗎？
 Zhangsan yinggai^D qu gongzuo le ma?
 Zhangsan should go work SFP MA
 ‘Has it become the case that Zhangsan should go to work?’
- (18) a. John {must^{E/D}/may^{E/D}} leave early tonight.
 b. {Must^D/may^D} John leave early tonight?
 (Drubig 2001: 11)

As shown in the examples of (17) and (18), deontic is the only possible interpretation out of the two ambiguous readings (either deontic or epistemic interpretation) when a yes/no question is formed. In the following (19) and (20), it is shown that when indirect questions and ambiguous modals appear in the same sentence, deontic reading is the only result. Here *yinggai* can only be understood as auxiliary “should”.

6 It has been pointed out to the author that the relative height of MA 嗎, and BA 吧 is not easily determined. Consequent to the non-occurrence nature of the two SFPs, one can only depend on their compatibility and the relative order with other elements in a sentence. Here I believe that BA 吧 is still higher than MA 嗎.

Indirect Questions

- (19) 我想知道為什麼張三應該回家了。

Wo xiangzhidao weisheme Zhangsan yinggai^D hui jia le.
 I wonder why Zhangsan should return home SFP
 'I wonder why it has become the case that Zhangsan should go home.'

- (20) I wonder {why/whether/if} John {must
- ^D
- /may
- ^D
- } leave early tonight.

Conditionals

- (21) a. 如果張三應該提早離開，他會事先告知。

Ruguo Zhangsan yinggai^D tizao likai, ta hui shixian gaozhi.
 if Zhangsan should earlier leave he will in-advance inform
 'If Zhangsan should leave earlier, he will inform (us) in advance.'

- b. If John {must
- ^D
- /may
- ^D
- } leave early tonight, ...

(Drubig 2001:11)

Wh-questions

- (22) a. 為什麼李四應該辭職了？

Weishenme Lisi yinggai^D cizhi le?
 why Lisi should resign SFP
 'Why should Lisi resign?'

- b. 誰應該提早離開？

Shei yinggai^D tizao likai?
 who should early leave
 'Who should leave early?'

- (23) a. Why {must
- ^D
- /may
- ^D
- } John leave early tonight?

- b. Who {must
- ^D
- /may
- ^D
- } leave early tonight?

Negations

- (24) a. 張三應該不去美國了。

Zhangsan yinggai^E bu qu Meiguo le.
 Zhangsan should NEG go America ASP
 'It should be the case that Zhangsan has not gone to America.'

- b. 張三不應該去美國了。

Zhangsan bu yinggai^D qu Meiguo le.⁷
 Zhangsan NEG should go America SFP
 'It has become the case that Zhangsan should not go to America.'

7 Thanks to an anonymous reviewer's comments that mention the possible epistemic reading of the construe with the following example (i). Although I do not totally agree the interpretation of epistemic reading, I would like to note and acknowledge it here. I think the most salient interpretation of "should" is an obligation.

(i) (根據張三的行事準則) 張三不應該這個時間還沒到，一定是你們弄錯了。

(Genju Zhangsan de xing-shi-zhun-ze) Zhangsan bu yinggai zhege shijian hai meidao,
 According to Zhangsan DE personal principle Zhangsan not should this time still not arrive
 yiding shi nimen nongcuo le.
 must be you mistaken PRT

'According to Zhangsan's principle, it should not be the case that he has not arrived yet. You must make a mistake.'

- (25) a. John may^E never leave early.
 b. Never may^D John leave early.
 (Drubig 2001: 7)

Negative Subject

- (26) 這個世界上，沒有人應該對你好。
 Zhe ge shijie shang, meiyouren yinggai^D dui ni hao.
 this CL world on nobody should to you nice
 ‘In this world, nobody should be nice to you.’

- (27) Nobody may^D be at home.
 (Drubig 2001: 6)

Similar to the same condition shown in Yes/no Questions (17) and (18) and Indirect Questions (19) and (20), it is noticed that Conditionals (21), Negations (24) and (25), and Negative Subjects (26) and (27) all observe the same pattern concerning Deontic/Epistemic interpretations. Epistemic reading is related to something higher in the structure, and the corresponding reading of deontic modals is relatively lower; so the SFPs could only affect the higher modal *yinggai*, and its corresponding reading.

3.2 Epistemic *keneng* ‘be likely to’

Conveying the possibility of the proposition, *keneng* ‘be likely to’ in MC could only be interpreted with an epistemic reading, as in (28a). However, different from epistemic *yinggai* ‘should’ described in the last section, the modal word *keneng* could be found grammatical in questions with epistemic reading, too. The following examples show how epistemic *keneng* survived in Yes/no Questions (28) (interactions with MA), Indirect Question (29), Conditional (30), *wh*-questions (31), and Negations (32). As shown in the following cases, all the *keneng* are interpreted as ‘it is possible that...’, which should be an epistemic reading.

Yes/no Questions

- (28) a. 張三可能去工作了。
 Zhangsan keneng^E qu gongzuo le.
 Zhangsan be-likely-to go work SFP
 ‘It’s possible that Zhangsan has gone for work.’
 b. 張三可能去工作了嗎？
 Zhangsan keneng^E qu gongzuo le ma?
 Zhangsan be-likely-to go work SFP SFP
 ‘Is it possible that Zhangsan has gone to work?’

Indirect question

- (29) 我想知道為甚麼張三可能回家了。
 Wo xiangzhidao weishenme Zhangsan keneng^E hui jia le.
 I wonder why Zhangsan be-likely-to return home SFP
 ‘I wonder why it is possible that Zhangsan has gone home.’

Conditional

- (30) *如果張三可能提早離開，他會事先告知。

*Ruguo	Zhangsan	keneng ^E	tizao	likai,
if	Zhangsan	be-likely-to	earlier	leave
ta	hui	shixian	gaozhi.	
he	will	in-advance	inform	

Intended: 'If it is possible for Zhangsan to leave earlier, he will inform (us) in advance.'

Wh-questions

- (31) a. 為甚麼李四可能回嘉義了？

Weishenme	Lisi	keneng ^E	hui	Jiayi	le?
why	Lisi	be-likely-to	return	Jiayi	SFP

'Why is it possible that Lisi has return to Jiayi?'

- b. 誰可能成為美國第一位女總統？

Shei	keneng ^E	chengwei	Meiguo	diyi	wei	nü	zongtong?
who	be-likely-to	become	USA	first	CL	female	president

'Who may become the first female President of USA?'

Negations

- (32) a. 張三可能不去法國了。

Zhangsan	keneng ^E	bu	qu	Faguo	le.
Zhangsan	be-likely-to	NEG	go	France	SFP

'It is possible that Zhangsan does not go to France.'

- b. 張三不可能去法國了。

Zhangsan	bu	keneng ^E	qu	Faguo	le.
Zhangsan	NEG	be-likely-to	go	France	SFP

'It has become impossible for Zhangsan to go to France.'

3.3 Predicates and subjects

In addition to the previous conclusion, we will also explore whether epistemic and deontic readings tend to be interpreted in specific environments, such as with stative/active verb-types or in-animacy/animacy subjects. As shown in (33a) and (34a), epistemic readings are natural in the environments of both stative (here "humble") and active (here "hit") predicate, while deontic readings (33b) and (34b) are also fine in the same context. So, first of all, the typology of predicate is not relevant to the topic described in Section 1.

- (33) a. 張三應該沒很謙虛。

Zhangsan	yinggai ^E	mei	hen	qianxu.	[Stative verb]
Zhangsan	should	NEG	very	humble	

'It is the case that Zhangsan is not very humble.'

- b. 張三不應該那麼謙虛。

Zhangsan bu- yinggai^D name qianxu. [Stative verb]
 Zhangsan NEG should so humble
 'Zhangsan should not be so humble.'

- (34) a. 張三應該沒揍李四。

Zhangsan yinggai^E mei zou Lisi. [Active verb]
 Zhangsan should NEG hit Lisi
 'It is the case that Zhangsan did not hit Lisi.'

- b. 張三不應該揍李四。

Zhangsan bu- yinggai^D zou Lisi. [Active verb]
 Zhangsan NEG should hit Lisi
 'Zhangsan should not hit Lisi.'

Secondly, the factor of subject animacy can be tested in the following examples of (35) and (36). Both subjects, inanimate in (35) and animate in (36), are capable of taking epistemic readings of modal auxiliaries in (35a) and (36a) and the deontic readings in (35b) and (36b). Therefore, with the examination on the two factors, it is obvious that the ambiguous interpretations are not attributed to the nature of subjects, and EPP features are not relevant to the phenomena described in the first section of this article. A hypothesis concerning the structure height could still be valid, in our perspective.

- (35) a. 房子裡應該沒住滿三個人。

Fangzi-li yinggai^E mei zhu-man san-ge-ren. [Inanimate subject]
 house-in should NEG live-full three-CL-people
 'It should not be the case that three people living in this house.'

- b. 房子裡不應該住滿三個人。

Fangzi-li bu-yinggai^D zhu-man san-ge-ren. [Inanimate subject]
 house-in NEG-should live-full three-CL-people
 'There should not be three people living in the house.'

- (36) a. 這三個人應該沒有住在房子裡。

Zhe-san-ge-ren yinggai^E meiyong zhuzai fangzi-li. [Animate subject]
 this-three-CL-people should NEG live-PROG house-inside
 'It should not be the case that these three people are living in this house.'

- b. 這三個人不應該住在房子裡。

Zhe-san-ge-ren bu-yinggai^D zhu-zai fangzi-li. [Animate subject]
 this-three-CL-people NEG-should live-at house-inside
 'These three people should not live in this house.'

In sum, to compare to the consistency of *must* and *may* in English, Chinese *yinggai* and *keneng* contrast with each other in different situations. As shown in Table 3, all the deontic readings of *yinggai* as well as the epistemic readings of *keneng* are available in the contexts designed and observed. The epistemic reading of

yinggai, however, is not sustainable in all the circumstances we manipulated; and this pattern has arisen as a result of the intervention of SFPs.

Table 3 Interactions between modals and SFPs⁸

Modals & readings situations	<i>yinggai</i>		<i>keneng</i>
	epistemic	deontic	epistemic
Yes/no-Q	X	✓	✓
Negation	Epi > Neg	Neg > Deo	Neg>Epi>Neg
Indirect-Q	X	✓	✓
Protasis	X	✓	X
Wh-adverb	X	✓	✓
Wh-nominal	X	✓	✓

4 SFPs and modals

4.1 Scopal interactions between modals and SFPs

Except for Erlewine (2017), who argues for a low periphery analysis, Pan (2019) suggests a topic-based analysis of the structure containing modals and SFPs. Empirically located at the final position in surface structure, SFPs are believed to take scope over the whole clause or all other components, based on their readings and functional natures. Similar to the interactions discussed in the previous sections, *yinggai* ‘should’, *keneng* ‘be likely to’ and *keyi* ‘can’ are further analyzed in terms of their interactions with SFPs, which include BA, NE, and MA. So, in the examples of (37), the similar surface of these occurrences could be interpreted either as epistemic or deontic with the only difference on SFP. (37b) should include the reading about speakers’ speculation, while (37a) shows only the normal epistemic reading.

Modals vs. speculative *BA*

- (37) a. 小美應該讀過這本書。
Xiaomei yinggai^E du-guo zhe ben shu.
Xiaomei should read.ASP this CL book
‘It should be the case that Xiaomei has read this book.’
- b. 小美應該讀過這本書吧。
Xiaomei yinggai^D du-guo zhe ben shu ba.
Xiaomei should read.ASP this CL book BA
‘In my speculation, Xiaomei is supposed to read this book.’

8 Some suggest that the higher *yinggai* can be interpreted as evidential, instead of epistemic. In this study, I am more conservative in this respect and do not intend to go further to assume another reading of high modal only to distinguish high *yinggai* from high *keneng*.

- (38) a. 小美可能讀過這本書吧。

Xiaomei *kenen*^E du-guo zhe ben shu ba.

Xiaomei be-likely-to read-ASP this CL book BA

‘In my speculation, it’s possible that Xiaomei has read this book.’

- b. 小美可能讀這本書吧。

Xiaomei *kenen*^E du zhe ben shu ba.

Xiaomei be-likely-to read this CL book BA

‘In my speculation, it’s possible for Xiaomei to read this book.’

- (39) 小美可以讀這本書吧。

Xiaomei *keyi*^{D/Dyn} du zhe ben shu ba.

Xiaomei can read this CL book BA

i. ‘In my speculation, Xiaomei is allowed to read this book.’

ii. ‘In my speculation, Xiaomei is able to read this book.’

To take a closer look at the examples of (38), utterances with both modal *keneng* ‘be-likely-to’ and SFP BA should appear as epistemic in their contexts with or without *guo*-. *Keyi* ‘can’ should be realized as both deontic and dynamic in (39). All of the examples mentioned here should always be compatible with the interpretation of ‘speculation’. On the other hand, the following examples (40), (41), and (42) are relevant with NE, which typically has the semantic denotation of “emphasis”. The baseline is that elements of the whole typology of modal verbs can be related to the emphasis NE, as shown in the cases of epistemic *yinggai*, deontic *yinggai* in (40), epistemic *keneng* in (41), and deontic/dynamic *keyi* in (42). Here a pattern different from the one shown above should be noted.

Modals vs. emphasis NE

- (40) a. 李四應該現在正忙著呢！

Lisi *yinggai*^E xianzai zheng mang-zhe ne!

Lisi should now PRO busy-ASP NE

‘It should be the case that Lisi is busy right now!’

- b. 李四才應該去台北呢！

Lisi cai *yinggai*^D qu Taibei ne!

Lisi just should go Taipei NE

‘Lisi is the one who should go to Taipei (, instead of others)!’

- (41) 李四才可能道歉呢！

Lisi cai *keneng*^E daoqian ne!

Lisi just be-likely-to apologize NE

‘It’s possible that Lisi is the one who apologizes (, instead of others)!’

- (42) 李四才可以喝酒呢！

Lisi cai *keyi*^{D/Dyn} he jiu ne!

Lisi just can drink wine NE

i. ‘It is Lisi who is allowed to drink (, instead of others)!’

ii. ‘It is Lisi who is able to drink (, instead of others)!’

For the third SFP, MA would be worthy of being noted in the current study. As demonstrated in the following (43), (44), and (45), epistemic *yinggai* seems to be capable of taking the ambiguous readings of the deontic and the epistemic as shown in (43). Again, the epistemic reading seems to be inappropriate with MA in the context of yes/no questions. That is, *yinggai* ‘should’ could be interpreted with deontic reading only in (43b); but epistemic *keneng* ‘be-likely-to’ and dynamic *keyi* ‘can’ have no discrepancy in the same respect. It is shown in (44) and (45) that the epistemic reading of *keneng* ‘be-likely-to’ is totally compatible with MA in (44b), and things are the same for *keyi* ‘can’ in (45) where both the dynamic and deontic meanings are available.

Yes/no question MA

- (43) a. 小孩子應該回家了。
 Xiaohaizi *yinggai*^{E/D} hui jia le.
 child should return home SFP
 i. ‘It should be the case that the child has gone home.’
 ii. ‘It has become the case that the child should go home.’
 b. 小孩子應該回家嗎？
 Xiaohaizi *yinggai*^D hui jia ma?
 child should return home MA
 ‘Is it the case that the child should go home?’
- (44) a. 小孩子可能回家了。
 Xiaohaizi *keneng*^E hui jia le.
 child be-likely-to return home SFP
 ‘It is possible that the child has gone home.’
 b. 小孩子可能回家嗎？
 Xiaohaizi *keneng*^E hui jia ma?
 child be-likely-to return home MA
 ‘Is it possible that the child went home?’
- (45) a. 小孩子可以回家了。
 Xiaohaizi *keyi*^{D/Dyn} hui jia le.
 child can return home SFP
 i. ‘The child has been permitted to go home.’
 ii. ‘The child has become enable to go home.’
 b. 小孩子可以回家嗎？
 Xiaohaizi *keyi*^{D/Dyn} hui jia ma?
 child can return home MA
 i. ‘Is the child permitted to go home?’
 ii. ‘Is the child able to go home?’

The final set of empirical data is concerning rhetorical questions. In general, a rhetorical question in MC is composed of a question, which is followed by an SFP MA, as well as an optional adverb *nandao* ‘is it?’. It can be seen in (46a, b). Again, the relevant deontic reading is preserved while the higher epistemic reading is eliminated for highest modal.

- (46) a. 小李應該結婚了。

Xiaoli yinggai^{E/D} jiehun le.

Xiaoli should marry SFP

i. 'It should be the case that Xiaoli has been married.'

ii. 'It has become the case that Xiaoli should get married.'

- b. 難道小李應該結婚了嗎？

Nandao Xiaoli yinggai^D jiehun-le ma?

NANDAO Xiaoli should marry MA

'Is it the case that Xiaoli should get married?'

- (47) a. 小李可能結婚了。

Xiaoli keneng^E jiehun le.

Xiaoli be-likely-to marry SFP

'It is possible that Xiaoli has been married.'

- b. 難道小李可能結婚嗎？

Nandao Xiaoli keneng^E jiehun ma?

NANDAO Xiaoli be-likely-to marry MA

'Is it possible that Xiaoli got married? I do not think so.'

- (48) a. 小李可以結婚了

Xiaoli keyi^{D/Dyn} jiehun le.

Xiaoli can marry SFP

i. 'It has become the case that Xiaoli is allowed to get married.'

ii. 'It has become the case that Xiaoli is able to get married.'

- b. 難道小李可以結婚嗎？

Nandao Xiaoli keyi^{D/Dyn} jiehun ma?

NANDAO Xiaoli can marry MA

i. 'Is Xiaoli allowed to get married? I do not think so.'

ii. 'Is Xiaoli able to get married? I do not think so.'

I'd like to give a special note here that Lin (2011: (18)–(21)) clearly distinguishes two modals in MC, *keneng* 'be likely to' and *neng* 'be able to', by means of the scopal interaction with SFP *le*. As one of SFPs, *le* is labeled as 'perf', which indicates the perfect/inchoative meaning of the sentence.

keneng vs. *le*

- (49) a. 張三可能[去嘉義了]。

Zhangsan keneng [qu Jiayi le]. [keneng >> le]

Zhangsan be-likely-to go Jiayi PERF

'Zhangsan may have gone to Jiayi.'

- b. *張三[[可能去嘉義]了]。

*Zhangsan [[keneng qu Jiayi] le]. [*le >> keneng]

Zhangsan be-likely-to go Jiayi PERF

Intended: 'It has become possible that Zhangsan goes to Jiayi.'

- (50) a. 張三[[能去嘉義]了]。
Zhangsan [[neng qu Jiayi] le]. [le >> neng]
Zhangsan be-able-to go Jiayi PERF
'It has become the case that Zhangsan is able to go to Jiayi.'
- b. *張三能[去嘉義了]。
*Zhangsan neng [qu Jiayi le]. [*neng >> le]
Zhangsan be-able-to go Jiayi PERF
Intended: 'Zhangsan is able to have gone to Jiayi.'

To give an interim summary on the patterns observed in the previous sections, we would like to illustrate the pattern in the following Table 4. Basically, epistemic readings with modal *yinggai* should be reconciled in the appearance of a specific sentence-final particle (again, SFP) – MA – but can be preserved with the cases of BA and NE. Although *keneng* also has epistemic readings, its readings stay intact in the contexts of four different SFPs, namely BA, NE, and two different MAs. As for the low auxiliary *keyi*, its interpretations are ambiguous between deontic and dynamic, and are not affected by the highly-located particles. This whole pattern is attributed to the nature of structure height in the spirit of cartography.

Table 4 Summary

Modal & readings SFPs	<i>yinggai</i>		<i>keneng</i>	<i>keyi</i>	
	epistemic	deontic	epistemic	deontic	dynamic
Speculative BA	✓	✓	✓	✓	✓
Exclamative NE	✓	✓	✓	✓	✓
Yes/no question MA	X	✓	✓	✓	✓
Rhetorical question MA	X	✓	✓	✓	✓

4.2 Separated and interwoven hierarchy between modals and SFPs

With the idea of separated SFPs in previous studies, we can map out the cartography of SFPs in relation to modals. These elements are presumed to occur in the structure tree as in the following (51), in terms of the scopal interactions among them. The inner-and-outer distinction between BA-type and MA-type of SFPs is marked by epistemic *yinggai*, so BA and MA occur above and below *yinggai*, respectively. When the higher BA appears on the top of the tree, the speculative and exclamative reading survives from the affection of epistemic reading, while readings as yes/no questions and rhetorical questions fail. The epistemic reading of the high modal comes from the [Spec QP] and cannot agree with the [head QP] of MA.

(51)

Without eliminating either epistemic or deontic reading, higher SFPs, such as BA and NE, take scope over both *yinggai*^E and *yinggai*^D. That is, modal auxiliaries still remain ambiguous in speculative and in exclamative environments. In yes/no or rhetorical questions, however, MA cannot take scope over epistemic *yinggai*, and fails the derivation of a question. On the contrary, epistemic *keneng* is presumed to locate lower, and can be correctly interpreted in yes/no or rhetorical questions. It is exactly for this reason that the pattern shown in (52) and (53) (repeated from (2) and (4)) emerges. MA in (52b) and (53) blocks the high epistemic reading of *keneng* and *yinggai* respectively.

(52) a. 張三可能（會）參選下一任市長嗎？

Zhangsan keneng (hui) canxuan xia-yi-ren shizhang ma?
 Zhangsan be-likely-to will join.election next-one-CL mayor SFP
 'It is possible that Zhangsan will run for the next election of mayor?'

b. *可能張三（會）參選下一任市長嗎？

*Keneng Zhangsan (hui) canxuan xia-yi-ren shizhang ma?
 possible Zhangsan will join.election next-one- CL mayor SFP

(53) 張三應該提早去嘉義嗎？

Zhangsan yinggai*^{E/D} tizao qu Jiayi ma?
 Zhangsan should early leave Jiayi SFP

i. *'Should it be the case that Zhangsan has set off to Jiayi early?'

ii. 'Is it the case that Zhangsan should set off to Jiayi early?'

5 Conclusion

In this paper, it is observed that the appearance of sentential final particles affects the grammaticality of sentence-initial adverbs. This effect can be contributed to the semantics and syntax of CP periphery. Following Tsai (2010)'s cartography of Chinese, we propose a structure in the left-most side of a sentence, within which the elements can either block or change each other.

(54) Force Mood Int Focus Mod Fin [IP Modal ...
 BA *yinggai*^E MA *keneng*^E *yinggai*^D

In this interwoven hierarchical structure, the correlation between modals and SFPs could be roughly accounted for. In the left periphery of MC, modals and SFPs mentioned above could be located as (54).⁹

Acknowledgments

For the time I was writing this paper, I was funded under the project 109-2410-H-002-193 by the Ministry of Science and Technology of Taiwan. The earlier version of this paper was once presented in the conference of International Symposium of Chinese in the Maritime Silk Road at The Chinese University of Hong Kong (7–8 April, 2017). I thank the audience for their comments and suggestions. I am also grateful for many people's help in writing this paper, including: Prof. Wei-Tien Dylan Tsai, Prof. Jonah Lin, Jowang Lin, Ray Huang, and Edwin Tsai, as well as my research assistants: Pui-Yi Mei and Mao-Chang Ku. Appreciation is given for their encouragement and substantial help on the paper. All the mistakes and shortcomings are mine.

References

- Butler, Jonny. 2003. A minimalist treatment of modality. *Lingua* 113. 967–996.
- Drubig, Hans Bernhard. 2001. *On the syntactic form of epistemic modality*. Unpublished manuscript, University of Tuebingen.
- Erlewine, Michael Yoshitaka. 2017. Low sentence-final particles in Mandarin Chinese and the Final-over-Final Constraint. *Journal of East Asian Linguistics* 26(1). 37–75.
- Huang, Xiao-You Kevin. 2007. *Initialness of sentence-final particles in Mandarin Chinese*. Unpublished manuscript, National Tsing Hua University.
- Kayne, Richard. 1994. *The antisymmetry of syntax*. Cambridge, MA: MIT Press.
- Law, Ann. 2002. *Syntax of Cantonese sentence-final focus particle timl*. Unpublished manuscript, University College London.
- Li, Boya. 2006. *Chinese final particles and the syntax of the periphery*. Leiden: University Leiden dissertation.
- Li, Charles N. & Sandra A. Thompson. 2009. *Mandarin Chinese : A functional reference grammar*. Taipei: Crane Publishing Co.
- Lin, Tzong-Hong Jonah. 2011. Finiteness of clauses and raising of arguments in Mandarin Chinese. *Syntax* 14(1). 48–73.
- McDowell, Joyce. 1987. *Assertion and modality*. Los Angeles: University of Southern California dissertation.
- Nuyts, Jan. 1993. Epistemic modal adverbs and adjectives and the layered representation of conceptual and linguistic structure. *Linguistics* 31. 933–969.

9 In addition to the previous conclusion, we will leave the further study with a possibility that epistemic and deontic readings tend to be interpreted in specific environments, such as stative/ active verb-type or inanimacy/ animacy subject.

- Palmer, F.R. 2001. *Mood and modality*, 2nd edn. Cambridge: Cambridge University Press.
- Pan, Victor. 2015. Mandarin peripheral construals at syntax-discourse interface. *The Linguistic Review* 32(4). 819–868.
- Pan, Victor. 2019. *Architecture of the periphery in Chinese: Cartography and minimalism* (Routledge Studies on Chinese Linguistics). London & New York: Routledge.
- Rizzi, Luigi. 1997. The fine structure of the left periphery. In Liliane Haegeman (ed.), *Elements of grammar: Handbook in generative syntax*, 281–338. Dordrecht: Kluwer.
- Rizzi, Luigi. 2004. Locality and left periphery. In Adriana Belletti (ed.), *Structures and beyond: The cartography of syntactic structures*, vol. 3, 223–251. New York: Oxford University Press.
- Tang, Sze-Wing. 1998. *Parametrization of features in syntax*. Irvine, CA: University of California, Irvine dissertation.
- Tang, Ting-Chi & Chih-Chen Jane Tang. 1997. Huayu qingtaici xulun [Introduction to Chinese modal auxiliaries]. In Shijie Huayuwen Jiaoyu Xuehui [World Chinese Language Association] (ed.), *Diwu Jie Shijie Huayuwen Jiaoxue Yantaohui Lunwenji: Yuwen Fenxi Zu* [Proceedings for the Fifth World Conference on Chinese Language Teaching], 175–197. Taipei: Shijie Huawen Chubanshe [World Chinese press].
- Tsai, Wei-Tien Dylan. 1994. *On economizing the theory of A-bar dependencies*. Cambridge, MA: Massachusetts Institute of Technology dissertation.
- Tsai, Wei-Tien Dylan. 2010. Tan Hanyu motaici de fenbu yu quanshi zhi duiyingguanxi [On the syntax semantics correspondences of Chinese modals]. *Zhongguo Yuwen* [Studies of the Chinese language] 3. 208–221, 287.
- Yang, Chung-Yu Barry. 2012. Intervention effects and *wh*-construals. *Journal of East Asian Linguistics* 21. 43–87.
- Zhang, Yisheng. 2000. *Xiandai Hanyu xuci* [Functional words in modern Chinese]. Shanghai: Huadong Shifan Daxue Chubanshe [East China Normal University press].

Liching Livy Chiu

Mailing address: Graduate Program of Teaching Chinese as a Second Language,
National Taiwan University, No. 1, Sec. 4, Roosevelt Rd., Taipei
10617, Taiwan

Email: lichingchiu@ntu.edu.tw

Received: November 30, 2020

Accepted: June 4, 2021

以製圖理論視角看模態助動詞以及句末助詞的互動

邱力環

台灣大學

提要

本文以製圖理論為出發點，探討漢語“句末助詞”以及“模態助動詞”的句法語意互動。中文的這兩類成分通常傳達說話者對世界的了解、判斷、意圖和說話者的主觀態度，而句法上這些都與左緣結構相關，也因此反應相關的地貌。具體而言，漢語的兩個高模態詞，“應該”與“可能”本來可出現於句首以及主調之間，但在句末助詞出現的情境下反而造成病句，表現出不能先於主語。其次，句末助詞的部分則需要將結構高的“吧”和位置低的“嗎”兩類區分開來；將句末助詞的次序映照在模態助動詞上，便形成交錯的語序。最後，本研究結論建構一個左緣的語序地貌圖，對兩種成分的互動現象提出合理的解釋。

關鍵詞

製圖理論，左緣結構，句末助詞，模態助動詞