Journal of Linguistics (2026), **62**, 695–707
doi:10.1017/S0022226725100935

Journal of Linguistics
CAMBRIDGE UNIVERSITY PRESS

SQUIB

Cartography and the stackability of Mandarin modals

Jackie Yan-Ki Lai and Xiaoli Sun

Department of Linguistics and Translation, City University of Hong Kong
Corresponding author: Xiaoli Sun; Email: xiaolisun2-c@my.cityu.edu.hk

Received: 05 January 2024; **Revised:** 12 August 2025; **Accepted:** 20 August 2025

Keywords: cartography; clause structure; functional projections; Mandarin; modals

Abstract
An open question about cartography is whether one and the same functional head may iterate on the functional hierarchy. We demonstrate that the stackability of certain modals from the same semantic class in Mandarin offers clear evidence for such a possibility.

1. Introduction

Cartography is a research project that is devoted to the precise characterisation of the fine details of the universal functional sequence *fseq* that makes up each syntactic phrase. In particular, the highly articulated nature of the structural maps drawn is a corollary of the following assumptions:

(1) (a) Each morphosyntactic feature constitutes an independent head ('One Feature–One Head' principle; Cinque & Rizzi 2010).
(b) A head can admit at most one specifier and one complement (Linear Correspondence Axiom; Kayne 1994).

Since its conception around the 1990s, cartographic research has featured a rich variety of languages, including East Asian languages like Mandarin (Paul 2005, 2014, Tsai 2008, 2018, Stepanov & Tsai 2008, Badan & Del Gobbo 2011, Si 2021, 2023; see also the papers collected in Tsai 2015b and Si 2017) as well as languages from other families. In this squib, we observe that multiple modals belonging to the same semantic class, especially those encoding epistemic meaning, may co-occur within a single sentence in Mandarin, and explore the implications of such an observation for cartography in general. As will become clear, the present study yields novel evidence for the existence of recursive functional heads.

© The Author(s), 2025. Published by Cambridge University Press. This is an Open Access article, distributed under the terms of the Creative Commons Attribution licence (http://creativecommons.org/licenses/by/4.0), which permits unrestricted re-use, distribution and reproduction, provided the original article is properly cited.

https://doi.org/10.1017/S0022226725100935 Published online by Cambridge University Press

This squib is organised as follows. Section 2 introduces Tsai's (2010, 2015a) cartographic analysis of Mandarin modals. Section 3 demonstrates that epistemic modals may in fact co-occur in a multiple-modal sentence. Section 4 then explores how the stackability of epistemic modals can be accommodated under the cartographic framework. Section 5 discusses the implications of the present findings, and Section 6 concludes.

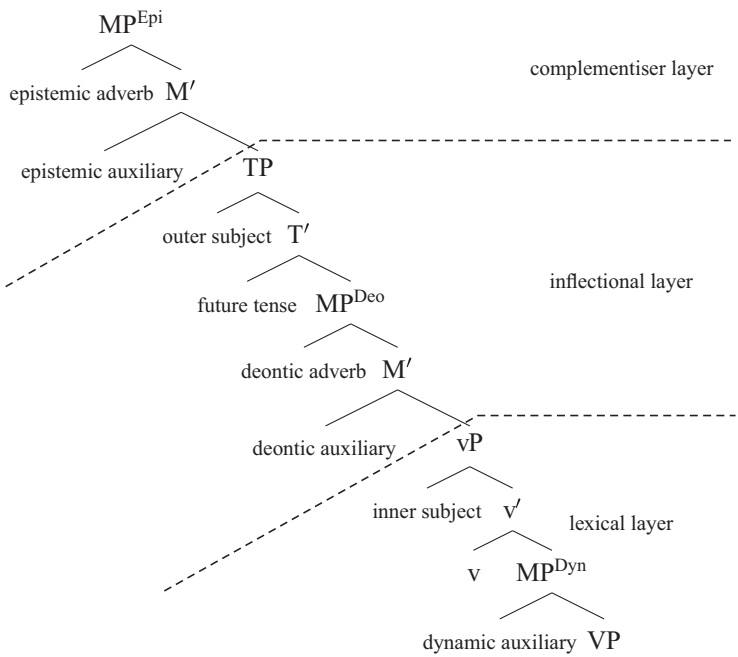
2. On the cartography of Mandarin modals

Tsai (2010, 2015a) examines the topography of Mandarin modals and arrives at the following ordering restrictions:

(2) epistemic adverb > epistemic auxiliary > deontic adverb > deontic auxiliary > dynamic auxiliary

Adopting cartographic assumptions, Tsai takes such rigid orderings to reflect the hierarchical arrangements of the functional projections introducing different semantic classes of modals, whereby MP^{Epi} dominates MP^{Deo}, which in turn dominates MP^{Dyn}. Incidentally, Tsai also notes that these projections each occupy a distinct zone under the familiar tripartite view of clausal organisation.

(3)



(taken from Tsai 2010: 220, our translation)

Tsai recognises the existence of two syntactic classes of modals in Mandarin, namely adverbs and auxiliaries. Examples of the former include *yiding* 'surely', *dagai* 'probably' and *bixu* 'obligatorily', and examples of the latter include *ken* 'be willing to', *hui* 'be capable

https://doi.org/10.1017/S0022226725100935 Published online by Cambridge University Press

of' and *yao* 'be going to' (Tsai 2010: 214). Furthermore, modal adverbs are analysed as specifiers of dedicated functional projections, whereas modal auxiliaries are analysed as (non-affixal) heads of these projections. Under the antisymmetric view of syntax (Kayne 1994) which cartographic studies standardly assume, the fact that the ordering restrictions that hold of modal auxiliaries exactly match those that hold of modal adverbs – as seen in (2) – falls out.

It is clear that cartographic accounts like Tsai (2010, 2015a) yield considerable mileage in making sense of the observed ordering restrictions. It is hardly surprising, therefore, that the domain of modals is offered as a prime example of how cartography can inform Chinese syntax (and vice versa) in a recent overview article on the topic (see Tsai 2019: 31–32).

3. Co-occurrence of modals

An interesting fact that has received increasing attention in the literature (Tsai 2010, 2015a, Lin 2012, Lai & Li 2024) concerns the possibility of co-occurrence of multiple modals. In the following example, for instance, the deontic modal *bixu* co-occurs with the dynamic modal *hui*:

(4) houxuanren **bixu hui** shuo zhishao san-zhong yuyan
candidate must be_capable_of speak at_least three-CL language
'Candidates must be capable of speaking at least three languages.'

While such multiple-modal data as (4) fall squarely under Tsai's (2010, 2015a) cartographic account, what the current studies have failed to explicitly highlight is that multiple modals of the *same* semantic class may also co-occur within a single sentence. The following naturalistic examples all involve the *dagai–keneng* sequence, a combination not noted in prior literature:

(5) **dagai keneng** ta dou yijing shuo-hao le
probably probably 3SG even already say-done SP
'He has probably even already come to an agreement (with somebody).'
http://phtv.ifeng.com/a/20170327/44562698_1.shtml

(6) **dagai keneng** ta zhe beizi zhende tuo-bu-liao-dan
probably probably 3SG this lifetime really rid-NEG-finish-single
'He will probably really fail to get rid of his single marital status throughout his lifetime.'
http://redian.news/wxnews/48160

(7) **dagai keneng** ta zai mianshi de shihou wangji ziji yao
probably probably 3SG at interview DE time forget self want
yingpin de zhiwei le
apply DE position SP
'He has probably forgotten the position he wanted to apply for at the interview.'
http://www.sohu.com/a/588233781_120953158

https://doi.org/10.1017/S0022226725100935 Published online by Cambridge University Press

Both *dagai* and *keneng* belong to the class of epistemic modals. Crucially, the authoritative BCC corpus (http://bcc.blcu.edu.cn) yields 81 examples containing the string '*dagai keneng*', which thus indicates that such a combination is representative. Some attested examples from the corpus are reproduced below:

(8) ta **dagai** **keneng** kandao quanbu ne!
3SG probably probably see all SP
'She probably saw everything!' (BCC corpus)

(9) women cengjing shi tongzhuo, wo xiang **dagai** **keneng** ni
1PL once be deskmate 1SG think probably probably 2SG
ye wang-le
also forget-PFV
'We were once deskmates; I guess you have probably also forgotten (it).' (BCC corpus)

Before proceeding further, it might be tempting to assign a biclausal structure to the above examples, such that the epistemic modals *dagai* and *keneng*, despite appearances, are located in separate clauses:

(10) $[_{CP}$ dagai $[_{CP}$ keneng …]]

However, it is worth noting that *dagai* is commonly assumed to be a modal *adverb* in the literature (see Li 1990: 150, Tang 1998: 164, Law 2006: 118, Yang & Ku 2006: 427 among many others) – in fact, we know of no existing work that departs from such an assumption. Notice that *dagai* does not appear in A-not-A form (i.e. **da-bu-dagai*), on a par with clear examples of adverbs like *xiaoxinde* 'carefully' (i.e. **xiao-bu-xiao-xin-de*). Accordingly, the biclausal analysis as sketched in (10) can simply be dismissed, because adverbs do *not* select (clausal) complements.

4. Stackability in cartography

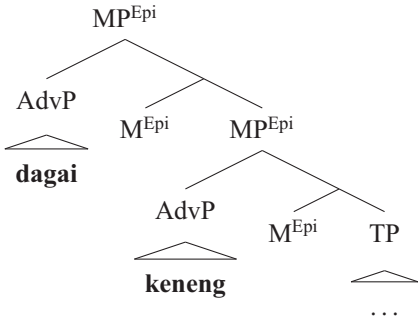
The potential co-occurrence of epistemic modals in Mandarin, as seen in (5)–(7), now raises the non-trivial question of how it can be accommodated under an analysis that incorporates cartographic assumptions (see Section 1). In this section, we will demonstrate that an adequate analysis of the current facts necessitates the proliferation of M^{Epi} heads.

4.1. Head recursion

The syntactic status of *keneng* 'probably' is a controversial issue, and both the XP and X^0 views have been proposed. For example, Li (1990) notes that '*keneng* can be an adverb' (*ibid.*: 150). Accordingly, multiple epistemic modals can be introduced in the specifiers of separate functional projections:

https://doi.org/10.1017/S0022226725100935 Published online by Cambridge University Press

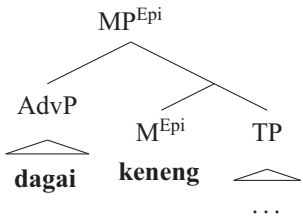
(11)



Under this analysis, it is clear that the M^{Epi} head is recursive (i.e. $M^{Epi}*$).

On the other hand, several existing studies take *keneng* to be a head instead (Lin & Tang 1995, Lin 2011, 2012, Chou 2013). The co-occurrence of epistemic modals may then be dealt with as follows:

(12)



Interestingly, the proliferation of M^{Epi} heads is an *inescapable* conclusion even under such an alternative analysis. To see this, it is necessary to ascertain what Tsai (2010, 2015a) initially takes to be instantiations of the M^{Epi} head. Although no clear answer can be drawn from Tsai (2010), the subsequent work of Tsai (2015a) makes explicit that the modal *hui* that co-occurs with an epistemic modal (henceforth 'irrealis *hui*') is one such element, as in the following example:

(13) waijiaoguan dagai **hui** lai zheli
diplomat probably IRR come here
'Diplomats will probably come here.' (Tsai 2015a: 276)

The analysis in (12) thus predicts the modal *keneng* and the irrealis *hui* to be in complementary distribution, which is however *incorrect*:

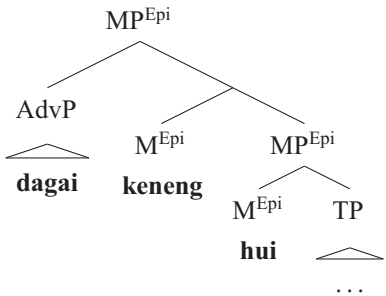
(14) waijiaoguan dagai **keneng** **hui** lai zheli
diplomat probably probably IRR come here
'Diplomats will probably come here.'

As such, we are back to the proliferation of M^{Epi} heads.[1]

[1] A *JL* referee asks if (14) might be biclausal. Note, however, that *keneng* is taken to be an M^{Epi} here, which is a functional head. Functional heads, unlike lexical ones, do not c-select.

https://doi.org/10.1017/S0022226725100935 Published online by Cambridge University Press

(15)



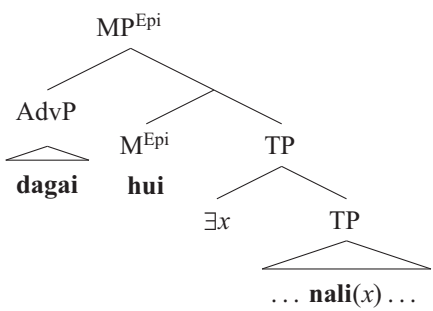
The skeptical reader might wonder why the modal *hui* in examples like (13) should instantiate M^{Epi0} instead of some lower functional head (e.g. T^0). Indeed, the Mandarin word *hui* is multi-functional, and the observed linear order itself is not incompatible with such possibilities. In this respect, Tsai (2015a) offers an argument for the hypothesised position of the irrealis *hui.* In Mandarin, *wh*-phrases are not inherently interrogative expressions, but may receive a non-interrogative interpretation in certain contexts (Li 1992). The crucial observation is that whereas the irrealis *hui* may license a *wh*-indefinite, the future *hui* may not:

(16) (a) chufa qian, Akiu dagai **hui** dao nali xiuxi yixia
depart before Akiu probably IRR go where rest a_bit
'Before departing, Akiu will probably go somewhere to take a bit of rest.'
(Tsai 2015a: 285)

(b) *Akiu **hui** changchang dao nali xiuxi yixia
Akiu FUT often go where rest a_bit
Intended: 'Akiu will often go somewhere to take a bit of rest.'
(*ibid.*: 286)

According to Tsai, the contrast follows because the irrealis *hui* is high enough to trigger existential closure at the TP-level (Heim 1982), as (17) exemplifies. On the other hand, the future *hui*, which is taken to occupy T^0, is too low to trigger such an operation.

(17)



The fact that the *wh*-phrase in examples like (18) may be interpreted as indefinite, therefore, corroborates the analysis shown in (15), where the modal *hui* instantiates an X^0 *outside* TP.

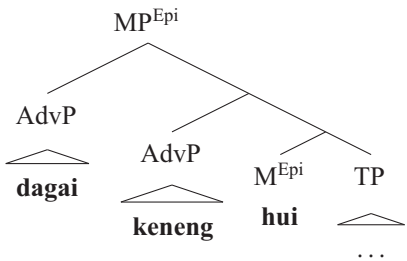
https://doi.org/10.1017/S0022226725100935 Published online by Cambridge University Press

(18) chufa qian, Akiu dagai keneng **hui** dao nali xiuxi yixia
depart before Akiu probably probably IRR go where rest a_bit
'Before departing, Akiu will probably go somewhere to take a bit of rest.'

4.2. Multiple specifiers?

Taking a step back, however, one might wonder if *dagai* and *keneng* may both be introduced by one and the same functional head M^{Epi}, which can itself be realised by the irrealis *hui*:

(19)



However, for the current analysis to truly have force, its proponents must demonstrate that the epistemic modal *keneng* can *never* be a head (pace Lin & Tang 1995, Lin 2011, 2012, Chou 2013), since if it can, M^{Epi} will again be recursive when *keneng* is a head. Notice also that elements such as focalised phrases readily intervene between the two epistemic modals:

(20) dagai **zhiyou tamen** keneng hui tou shubao
probably only 3PL probably will steal schoolbag
'Probably only they will steal schoolbags.'

(21) dagai **lian Zhangsan dou** keneng yao lai
probably LIAN Zhangsan DOU probably want come
'Probably even Zhangsan wants to come.'

These facts are not immediately expected if *dagai* and *keneng* are specifiers of one and the same M^{Epi}, since there would be no space for a distinct functional head that introduces a focalised phrase in between.

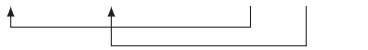
More generally, as mentioned in Section 1, one hallmark of cartography (Rizzi 1997; Cinque 1999 among many others) is the adoption of some version of Kayne's (1994) Linear Correspondence Axiom, a linearisation scheme that has the effect of ruling out multiple specifiers. In more recent work, Rizzi (2017) also explicitly denies multiple-specifier representations 'on grounds of restrictiveness' (*ibid.*: 184), now based on comparative evidence (see also Rizzi & Bocci 2017: 19–20 for relevant discussion). For all these reasons, therefore, the current analysis will not be further entertained.

4.3. Preposing?

Let us also consider the possibility that preposing is involved in deriving the multiple-modal sentences of interest (Lai & Li 2024; cf. Tsai 2010, 2015a):

https://doi.org/10.1017/S0022226725100935 Published online by Cambridge University Press

(22) **dagai**$_1$ **keneng**$_2$ SUBJ —$_1$ —$_2$ . . .



In fact, this is irrelevant, because the crucial question remains as to what the representation would be for these epistemic modals *prior to movement.* In this connection, it is worth noting that the *dagai–keneng* sequence is *not* limited to pre-subject position. We have already seen an attested example in (8) where the sequence appears *after* the surface subject, repeated as (23) below for convenience, together with two additional examples.

(23) ta **dagai** **keneng** kandao quanbu ne! =(8)
3SG probably probably see all SP
'She probably saw everything!' (BCC corpus)

(24) ta **dagai** **keneng** zhe beizi zhende tuo-bu-liao-dan
3SG probably probably this lifetime really rid-NEG-finish-single
'He will probably really fail to get rid of his single marital status throughout his lifetime.'

(25) women cengjing shi tongzhuo, wo xiang ni **dagai** **keneng**
1PL once be deskmate 1SG think 2SG probably probably
ye wang-le
also forget-PFV
'We were once deskmates; I guess you have probably also forgotten (it).'

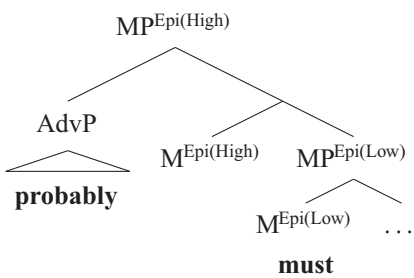
Again, preposing does not help escape from the conclusion that the proliferation of M^{Epi} heads is necessary.

4.4. Interim conclusion

Taken together, we conclude that the domain of Mandarin modals constitutes a novel piece of evidence that one and the same functional head can be recursive.

Recently, Cinque (2017) proposed the idea of 'paired functional projections' (see Tescari Neto 2022 for further support for such a claim). In essence, the idea is that a functional projection FP consists of lower and higher sub-projections. As an illustration, the 'unitary' functional projection MP^{Epi} will accordingly comprise the sub-projections $MP^{Epi(Low)}$ and $MP^{Epi(High)}$:

(26)

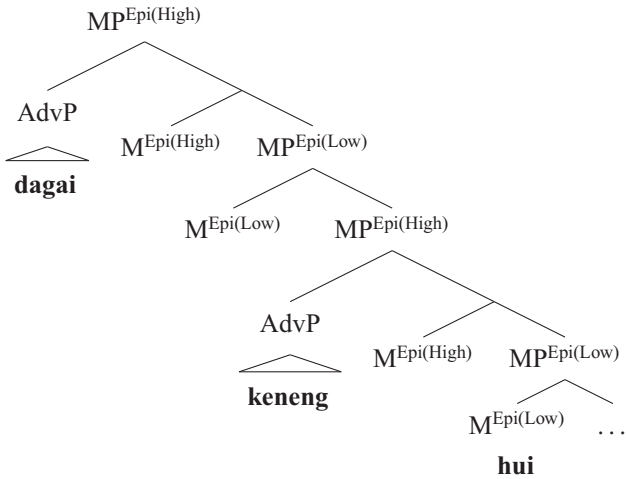


What matters for present purposes is that the splitting of projections this way does *not* make available additional structural positions. In Cinque's (2017) conception, the lower

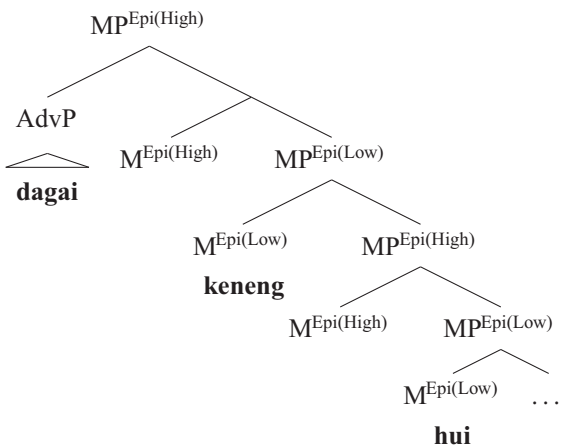
https://doi.org/10.1017/S0022226725100935 Published online by Cambridge University Press

sub-projection $FP^{(Low)}$ encodes the 'core functional notion', whereas the higher sub-projection $FP^{(High)}$ represents an 'adverbial modification of the same functional notion' (*ibid.*: 522).[2] Hence, the current conclusion will remain unscathed should we adopt the recent idea of paired functional projections: depending on whether *keneng* is a phrase or a head, we will end up having the representation in (27) or (28), which *still* involves recursive 'MP^{Epi}'s:

(27)



(28)



5. Implications

The overall conclusion from Section 4.4 is significant in the following sense. In cartography, one open question is whether a functional head may truly iterate. In the latest overview

[2] Crucially, Cinque (2017) assumes that phrasal movement (if any) does *not* directly target the specifier of $F^{(Low)0}$. Instead, it targets the specifier of a head sandwiched between $F^{(Low)0}$ and $F^{(High)0}$ – a *distinct* head that has neither semantic nor morphophonological properties. Notice that Tescari Neto (2022: 313) takes it to be a head that also makes up the classic F^0, viz. $F(Medial)^0$.

https://doi.org/10.1017/S0022226725100935 Published online by Cambridge University Press

summarising the major findings of cartographic studies (Rizzi & Cinque 2016), the detailed maps of the IP-, DP-, PP- and AP-zones *all* indicate that each functional head within a zone is unique and occupies a dedicated position. Concerning modal heads, Rizzi & Cinque (2016: 149) recognise the existence of five such heads on the functional hierarchy, namely $M^{epistemic}$, $M^{necessity}$, $M^{possibility}$, $M^{volition}$ and $M^{obligation}$, which, again, are all unique.

Tempting as it is to conclude that each functional head is thus unique, there exists a well-known (in fact, the *sole*) exception, namely the Top head. Rizzi & Cinque (*ibid.*: 146) offer the following fine structure of the clausal left periphery:[3]

(29) Force > Top* > Int > Top* > Foc > Top* > Mod > Top* > Q_{emb} > Fin

Nonetheless, more in-depth studies have revealed the existence of different kinds of topics associated with *distinct* interpretive properties (Benincà & Poletto 2004, Frascarelli & Hinterhölzl 2007, Bianchi & Frascarelli 2010), as Rizzi & Cinque (2016: 146) themselves also acknowledge. Specifically, Frascarelli & Hinterhölzl (2007) identify three sub-types of topics, namely aboutness topics, contrastive topics and familiar topics. Accordingly, the representation of a multiple-topic sentence may involve no 'true recursion' in the technical sense of the term. In fact, one of the main claims of Benincà & Poletto (2004) is precisely that 'recursion is *not* an option […] recursive in the sense that there is a virtually infinite set of *totally identical* Topic phrases' (*ibid.*: 53, our emphasis).

Recently, Rizzi (2017) briefly offers the following Italian example to support his claim that true recursion exists. As shown below, the example involves six topic phrases:

(30) **Gianni**, **a Piero**, **la sua residenza**, **a Parigi**, **da Londra**, **l'anno prossimo**, gliela farà spostare senz'altro.
Gianni to Piero the.FEM POSS.FEM residence to Paris from London the-year next 3SG.DAT–3SG.FEM make.FUT.3SG move.INF definitely
'Gianni, to Piero, his residence, to Paris, from London, next year, he will make him move it for sure.' (*ibid.*: 184)

In this respect, the current analysis of the novel Mandarin data adds a new dimension to the debate. First, it moves the relevant discussion from the familiar domain of topics to the seldom-discussed domain of modals. Second, the data offer a clear piece of evidence for the possibility of true recursion. In the current case, note that *both* the modals *dagai* and *keneng* belong to the class of epistemic modals. There is *no* detectable interpretive difference between the two, and hence no justification for assigning them to two separate semantic categories.[4]

Certainly, one might still insist to posit distinct functional projections such as *dagai*P and *keneng*P (despite what has just been said), and hierarchically arrange these projections in a specific way. To further strengthen the claim that true recursion is indeed at stake, the following examples from the BCC corpus are informative:

[3] The label 'Mod' in (29) stands for 'Modification' (see Rizzi 2004).

[4] For instance, Lin's (2012: 154) taxonomy identifies no further sub-category within the semantic class of Mandarin epistemic modals.

https://doi.org/10.1017/S0022226725100935 Published online by Cambridge University Press

(31) **yinggai keneng dagai *maybe*** keyi ba![5]
probably probably probably maybe can SP
'(It is) probably possible!' (BCC corpus)

(32) ruguo mei you iMac, wo **yexu keneng dagai** hui haohao
if NEG have iMac 1SG probably probably probably will properly
xuexi le
study SP
'If there were no iMac, I would probably study properly.' (BCC corpus)

(33) wo maosi haoxiang **yinggai keneng dagai** fashao le
1SG appear as_if probably probably probably get_fever SP
'I appear as if I have probably got a fever.' (BCC corpus)

(34) zuijin zhen you sher zhao wo, **keneng dagai yexu** keyi
recently really have matter find 1SG probably probably probably can
zai tushuguan zhao wo, …
at library find 1SG
'If you really need to reach me recently, you probably can find me in the library.' (BCC corpus)

Similar to the logic of Rizzi's (2017) example reproduced in (30), these data show that as many as four epistemic modals *can* co-occur in a sentence (in fact, more). More importantly, they demonstrate that the reverse order *keneng* > *dagai* is likewise attested (with 62 such examples in the BCC corpus). Both facts further support the view that MP^{Epi} is recursive in Mandarin.[6]

6. Conclusion

In this squib, we noted for the first time that epistemic modals may actually co-occur within the same clause in Mandarin. A detailed examination of the relevant data revealed that their structural representations necessarily involve recursion of the same functional projection. Accordingly, the domain of Mandarin modals constitutes novel and clear evidence for the claim that a functional head may iterate (at least for some heads in some languages), a finding that directly bears on the proper understanding of the 'One Feature – One Head' principle as standardly assumed in cartography.

Acknowledgements. We thank the editors and the three anonymous referees for their constructive comments. We are also grateful to Stephen Matthews for his assistance with glossing the Italian example. The usual disclaimers apply.

References

Badan, Linda & Francesca Del Gobbo. 2011. On the syntax of topic and focus in Chinese. In Paola Benincà & Nicola Munaro (eds.), *Mapping the left periphery*, 63–90. Oxford: Oxford University Press.

Benincà, Paola & Cecilia Poletto. 2004. Topic, focus, and V2: Defining the CP sublayers. In Luigi Rizzi (ed.), *The structure of CP and IP: The cartography of syntactic structures, vol.* 2, 52–75. Oxford: Oxford University Press.

[5] This is a code-mixing example involving the English epistemic adverb *maybe.*

[6] A *JL* referee asks *why* the epistemic modals *keneng* and *dagai* can co-occur in Mandarin. It is possible that languages differ in whether the same functional head (e.g. M^{Epi}) may iterate. We leave this interesting question for future work.

https://doi.org/10.1017/S0022226725100935 Published online by Cambridge University Press

Bianchi, Valentina & Mara Frascarelli. 2010. Is topic a root phenomenon? *Iberia* 2(1). 43–87.
Chou, Chao-Ting Tim. 2013. Unvalued interpretable features and topic A-movement in Chinese raising modal constructions. *Lingua* 123(1). 118–147.
Cinque, Guglielmo. 1999. *Adverbs and functional heads: A cross-linguistic perspective*. Oxford University Press.
Cinque, Guglielmo. 2017. On the status of functional categories (heads and phrases). *Language and Linguistics* 18. 521–576.
Cinque, Guglielmo & Luigi Rizzi. 2010. The cartography of syntactic structures. In Bernd Heine & Heiko Narrog (eds.), *The Oxford handbook of linguistic analysis*, 51–65. Oxford: Oxford University Press.
Frascarelli, Mara & Roland Hinterhölzl. 2007. Types of topics in German and Italian. In Kerstin Schwabe & Susanne Winkler (eds.), *On information structure, meaning and form*, 87–116. Amsterdam: John Benjamins.
Heim, Irene. 1982. *The semantics of definite and indefinite noun phrases*: University of Massachusetts, Amherst dissertation.
Kayne, Richard S. 1994. *The antisymmetry of syntax*. Cambridge, MA: MIT Press.
Lai, Jackie Yan-Ki & Haoming Li. 2024. Moving heads to specifiers: Evidence from Mandarin multiple pre-subject modals. *Natural Language and Linguistic Theory* 42. 247–272.
Law, Paul. 2006. Adverbs in A-not-A questions in Mandarin Chinese. *Journal of East Asian Linguistics* 15. 97–136.
Li, Audrey Yen-hui. 1992. Indefinite *wh* in Mandarin Chinese. *Journal of East Asian Linguistics* 1(2). 125–155.
Li, Yen-hui Audrey. 1990. *Order and constituency in Mandarin Chinese*. Dordrecht: Kluwer.
Lin, Jo-Wang & C.-C. Jane Tang. 1995. Modals as verbs in Chinese: A GB perspective. In *The Bulletin of the Institute of History and Philosophy, Academic Sinica*, vol. 6.1, 53–105.
Lin, Tzong-Hong Jonah. 2011. Finiteness of clauses and raising of arguments in Mandarin Chinese. *Syntax* 14(1). 48–73.
Lin, Tzong-Hong Jonah. 2012. Multiple-modal constructions in Mandarin Chinese and their finiteness properties. *Journal of Linguistics* 48(1). 151–186.
Paul, Waltraud. 2005. Low IP are and left periphery in Mandarin Chinese. *Recherches Linguistiques de Vincennes* 33. 111–134.
Paul, Waltraud. 2014. Why particles are not particular: Sentence-final particles in Chinese as heads of a split CP. *Studia Linguistica* 68(1). 77–115.
Rizzi, Luigi. 1997. The fine structure of the left periphery. In *Elements of grammar*, 281–337. Springer.
Rizzi, Luigi. 2004. Locality and left periphery. In Adriana Belletti (ed.), *Structures and beyond*, 223–251. New York: Oxford University Press.
Rizzi, Luigi. 2017. On the format and locus of parameters: The role of morphosyntactic features. *Linguistic Analysis* 41. 159–191.
Rizzi, Luigi & Giuliano Bocci. 2017. Left periphery of the clause – Primarily illustrated for Italian. In Martin Everaert & Henk C. van Riemsdijk (eds.), *The Wiley Blackwell companion to syntax*, second *edition*, John Wiley & Sons, Inc.
Rizzi, Luigi & Guglielmo Cinque. 2016. Functional categories and syntactic theory. *Annual Review of Linguistics* 2. 139–163.
Si, Fuzhen (ed.). 2017. *Jufa zhitu yanjiu* [*Studies on syntactic cartography*]. Beijing: Social Sciences in China Press.
Si, Fuzhen. 2021. Towards a cartography of light verbs. In Fuzhen Si & Luigi Rizzi (eds.), *Current issues in syntactic cartography: A crosslinguistic perspective*, 217–241. Amsterdam: John Benjamins.
Si, Fuzhen. 2023. *Jufa zhitu lilun yanjiu* [*Cartographic approach to syntax*]. Beijing: Foreign Language Teaching and Research Press.
Stepanov, Arthur & Wei-Tien Dylan Tsai. 2008. Cartography and licensing of *wh*-adjuncts: A cross-linguistic perspective. *Natural Language and Linguistic Theory* 26. 589–638.
Tang, Sze-Wing. 1998. *Parametrization of features in syntax*: University of California, Irvine dissertation.
Tescari Neto, Aquiles. 2022. "Adverbs and functional heads" twenty years later: cartographic methodology, verb raising and macro/micro-variation. *The Linguistic Review* 39. 293–331.
Tsai, Wei-Tien Dylan. 2008. Left periphery and *how-why* alternations. *Journal of East Asian Linguistics* 17(2). 83–115.
Tsai, Wei-Tien Dylan. 2010. Tan Hanyu motaici qi fenbu yu quanshi zhi duiying guanxi [On the syntax–semantics correspondences of Chinese modals]. *Zhongguo Yuwen* [*Studies of the Chinese Language*] 3. 208–221.
Tsai, Wei-Tien Dylan. 2015a. On the topography of Chinese modals. In Ur Shlonsky (ed.), *Beyond functional sequence*, 275–294. Oxford: Oxford University Press.
Tsai, Wei-Tien Dylan (ed.). 2015b. *The cartography of Chinese syntax: The cartography of syntactic structures, vol.* 11. Oxford: Oxford University Press.

https://doi.org/10.1017/S0022226725100935 Published online by Cambridge University Press

Tsai, Wei-Tien Dylan. 2018. High applicatives are not high enough: A cartographic solution. *Lingua Sinica* 4:2.
Tsai, Wei-Tien Dylan. 2019. Zhitu lilun he Hanyu yufa [Cartographic approach and the syntax of Chinese]. *Yuyanxue Yanjiu* [*Linguistic Research*] 1. 28–44.
Yang, Chun-Jung & Mao-Chang Ku. 2006. On the cleft construction in Mandarin Chinese. In *Proceedings of NACCL-22 and IACL-18, vol.* 2, 417–429.

Cite this article: Lai, Jackie Yan-Ki and Sun, Xiaoli. 2026. "Cartography and the stackability of Mandarin modals." *Journal of Linguistics*. 62, 695–707. doi:10.1017/S0022226725100935

https://doi.org/10.1017/S0022226725100935 Published online by Cambridge University Press