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Deriving head-final order in the peripheral domain of Chinese*

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Abstract

This article proposes a unified analysis of the peripheral projections in Chinese, which does not rely on a head-directionality parameter. Each of these projections constitutes a phase and that its head bears an EPP feature, which must be satisfied. Chinese peripheral projections demonstrate four different ways to satisfy EPP. Importantly, Sentence-Final Particles (SFPs) project phases and their complements obligatorily move to the specifier as a last resort to satisfy the EPP. The movement of the complement to the phase edge would postpone the transfer of phrases embedded in the complement, allowing these phrases to move later. When the phase edge is not available for the moved complement, phrases embedded within the complement will not be able to be extracted in the later stage after the complement is transferred. This constitutes a strong argument in favor of the obligatory complement-to-specifier raising analysis for SFPs in Chinese.

Key words: Sentence-Final Particle, left periphery, head-final, phase, Chinese

1. Introduction

1.1 Peripheral Projections in Chinese

Under the Split-CP hypothesis (see Rizzi 1997, Cinque 1999, Cinque & Rizzi 2008), the sentence peripheral domain contains different types of functional projections. Chinese is a very interesting case in terms of cartography: on the one hand, Chinese has different types of topics and foci, which are located in the left-periphery; on the other hand, it also possesses a rich system of Sentence-Final Particles (SFPs henceforth). SFPs in Chinese have been previously treated as head-final C taking their complements on the left side (see Lee 1986). Detailed discussion on the syntactic and semantic properties of SFPs can be found in Li 2006; Deng 2015; Paul 2014, 2015; Pan & Paul 2016; Paul & Pan 2017. In Pan 2015, 2019a, I propose a fine-grained architecture of CP containing SFPs, null operators, and topic projections. Crucially, core projections are distinguished from the optional ones (e.g., topics and foci) (also see Rizzi 1997, Boeckx 2008).

(1) The hierarchy of the core projections in the Chinese periphery[1]
AttP (Speaker's attitude) > **SQP** (Special questions) > **iForceP** (illocutionary force) > ***Only*P** (exclusive focus particles) > **S.AspP** (Sentential aspects) > TP…

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[1] The symbol " > " is used to indicate the hierarchical height among different projections; "XP > YP" means that XP is syntactically higher than YP.

Importantly, SFPs in Chinese are located in four different layers. The S.Asp particles are related to sentential aspects, such as *laizhe* indicating an action or a state in the recent past, *le* indicating a change of state, and *ne* indicating a progressive action or state. Particles such as *eryi* paraphrased as 'only', head an *only*-type of exclusive focus projection *Only*P. The iForce SFPs are related to the illocutionary force such as the *yes-no* question particle *ma*, the confirmation-request particle *ba*1, and the imperative particle *ba*2. SFPs expressing the speaker's subjective opinion or attitude are Att heads and they are located in the highest position in the left periphery, such as *ne*, *la*, *ba*3, *bei*. Here are some examples:

(2) a. [$_{S.AspP}$ [$_{TP}$ Zhangsan qu-guo Bali] [$_{S.Asp}$ ***le***]].
Zhangsan go-EXP Paris LE
'It is now the case that Zhangsan has visited Paris.'[2]

b. [$_{OnlyP}$ [$_{TP}$ Zhangsan bu he Faguo kafei] [$_{Only}$ ***eryi***]].
Zhangsan NEG drink French coffee ERYI
'It is just the case that Zhangsan does not drink French coffee. (Nothing serious!)'

c. [$_{iForceP}$ [$_{TP}$ Ni mingtian fei Beijing] [$_{iForce}$ ***ma***]]?
you tomorrow fly Beijing Q*yes-no*
'Will you fly to Beijing tomorrow?'

d. [$_{AttP}$ [$_{TP}$ Wo xiuxi-le zhengzheng yi-ge yue] [$_{Att}$ ***ne***]]!
I rest-PERF full one-CL month NE
'Look, I had a rest for a whole month!'

e. Hierarchy: iForceP (*ma*) > *Only*P (*eryi*) > S.AspP (*le*) > TP
[$_{iForceP}$ [$_{OnlyP}$ [$_{S.AspP}$ [$_{TP}$ Ta zhibuguo bu he ying
she no.more.than NEG drink English
shi hongcha] [$_{S.Asp}$ ***le***]] [$_{Only}$ ***eryi***]] [$_{iForce}$ ***ma***]]]?
style red.tea LE ERYI Q*yes-no*
(Lit.) 'Is it just the case that she no longer drinks English black tea?'
= 'Does she only no longer drink English black tea?'

(2e) is an example with a cooccurrence of three SFPs with a fixed order. The lowest sentential aspect particle *le* is paraphrased as 'no longer' (with negation). The medium is the *only*-type exclusive focus particle *eryi* paraphrased as 'it is just the case'.[3] The highest is the *yes-no* question particle *ma*. Since *ma* takes a wide scope, the entire sentence can only be interpreted as a root *yes-no* question. The particle *le* takes a narrow scope over the TP. The particle *eryi*

[2] The abbreviations used in the glosses are as follows: CL: classifier; DE: the structural particle placed between an NP and its determiner; DECL: declarative; EXP: experiential aspect; IMP: imperatives; NEG: negative element; PERF: perfective aspect marker; PL: plural form; PROG: progressive aspect; Q: question particle; SFP: Sentence Final Particle.

[3] I make a distinction between the adverb *zhi* 'only' and the SFP *eryi* 'only'. An anonymous reviewer correctly points out that as a focus operator, *zhi* 'only' must be associated with a constituent inside its scope. Conversely, *eryi* 'only' does not focus on one specific element in a given sentence; instead, it scopes over the entire sentence and is interpreted as 'it is only the case that…' or 'it is just the case that…'.

(i) Ta chu-men qu wan-le yihuir eryi.
she go.out go play-PERF a.moment ERYI
(Lit.) 'It is only the case that she went out for a while. (Nothing to be worried about!)'

'only' takes a medium scope: it scopes over the S.AspP headed by *le*, but falls under the scope of *ma.*

Optional projections such as TopP can intervene between any two of the core projections and their positions in the hierarchy are relatively free. Pan's (2015) work entertains the framework of Principles and Parameters and assumes the existence of a head-parameter. Namely, Top head is an initial head and it takes its complement on the right side; by contrast, SFPs in Chinese are identified as final C heads, taking their complements on the left side. Table 1 summarizes the distribution of these peripheral projections. The second column of the table indicates a projection's status (i.e., core projection or optional projection). The third column indicates the head directionality for each projection (i.e., head-initial or head-final). The fourth column indicates the realization of the head of each projection (i.e., whether such a projection has an overt head realized by an SFP, or just a null head). One can clearly read off the table that assumed head-final projections in Chinese are S.AspP, *Only*P, iForceP (for *yes-no* questions and imperatives), and AttP.

Table 1 Peripheral projections on Chinese

Projections	***Status of the projection***	***Relative position of heads***	***Realization of heads***
	Core or optional?	*Initial or final?*	
TopP	Optional	Initial	No
SQP	Core	Initial	No
iForceP: *wh*-	Core	Initial	No
AttP	Core	Final	Yes
iForceP: -*yes*-no questions - imperatives	Core Core	Final Final	Yes Yes
***Only*P**	Core	Final	Yes
S.AspP	Core	Final	Yes

1.2 Organization of the Argumentation

Section 2 outlines the main proposals of the article, which do not rely on a head-directionality parameter. Sections 3 and 4 are devoted to a detailed demonstration of the application of my analysis to simple and complex cases. Section 5 discusses the remaining issues and section 6 concludes the paper.

2. Main Proposals

In section 1, I have presented the head-final analysis of SFPs proposed in previous studies and this analysis relies on the existence of a directionality parameter. Alternatively, it has been argued that the final order of SFPs is derived by raising the complement TP to the Spec of C (see Tang 1998, Sybesma 1999, Julien 2002, Simpson & Wu 2002, Takita 2009, and Hsieh & Sybesma 2011, a.o.). Although the analysis of this article is sympathetic to this general idea, the motivation for such a raising and technical details of the derivation do differ, as will be elaborated in section 3. My proposal relies on the assumption that each peripheral projection in Chinese constitutes a phase and that each peripheral head has an EPP feature, which must be satisfied. As a result, the specifier of these projections must be projected.[4]

[4] My proposal is in the framework of the Minimalist Program (see Chomsky 2000, 2001, 2004, 2008, 2012, 2019; Chomsky, Gallego & Ott 2019); the derivation in this paper will follow Bare Phrase Structure, and occasionally notations such as "C head", "complement", and "specifier" are used for convenient demonstrative purposes only. Merge is the only derivational mechanism and Move is treated as Internal Merge.

2.1 Phasehood of Peripheral Projections

Phases define derivational units, which are transferable units for semantic interpretation at Conceptual-Intentional (C-I) interface and for phonological realization at Articulatory-Perceptual (A-P) interface (see Chomsky 2000, 2001). In other words, phases are syntactic objects, which form units for computation and for Transfer. These objects are phonologically isolable and semantically propositional. In the current model, a verb phrase where all θ-roles are assigned and a full clause including tense and force are considered as a phase. Therefore, transitive *v*P and CP are phases. Citko (2014) has proposed the formal diagnostic tests for phasehood. Take CP as an example.

(3) PF phasehood diagnostics

a. Does C trigger Spell-Out? Yes, because VP-internal elements are inaccessible.

b. Does CP determine phonological domains? Yes.

c. Can the complement of C be elided? Yes, for instance, sluicing.[5]

(4) LF phasehood diagnostics

Can an element moving out of CP be interpreted in the edge position? Yes, this can be seen under scoping effects.

(5) Syntactic phasehood diagnostics

a. Can an element moving out of CP be pronounced (partially or completely) at the edge? Yes, for instance, preposition stranding, *wh*-copying, scope marking.

b. Is CP a domain for feature valuation? Yes, at least this is true for root *wh*-questions.

c. Is C the source of uninterpretable features? Yes, for uninterpretable ϕ and the interrogative feature.

In this article, I propose that each peripheral projection in Chinese is a phase: S.AspP, *only*P, iForceP, NegQP, AttP, and TopP. All these peripheral projections are phonologically isolable, semantically propositional, and they define Transfer points, as will be detailed in section 4. Importantly, the head of each peripheral projection can take a TP as its complement and each peripheral projection itself corresponds to an independent sentence. For instance, iForceP, hosting interrogative and imperative particles, corresponds to a root sentence with force, which satisfies criteria for phase. Under the split-CP hypothesis *à la* Rizzi (1997), Spec of TopP is a locus for Ā-movement. In Chomsky 2008, Ā-movement is to satisfy the requirement of the Edge Feature (EF) associated with phase heads (i.e., transitive *v*, intermediate C, and the highest C). In other words, only phase heads bear an EF feature and Ā-movement only targets the edge of phases. If Spec of TopP is a locus for Ā-movement, then it is natural that TopP is a phase. As for SQP (special questions), I will demonstrate in detail that it must be a phase, otherwise the derivation crashes (see section 4.4.3). Specifically, attitude-related projection AttP in the sense of Pan 2015 and Paul 2015 corresponds to Speech-Acts Projection (SAP), which is treated as a phase by scholars like Sheehan et al. (2017:ch. 9). Let us apply Citko's (2014) phasehood tests to AttP.

[5] However, this is not so obvious. In fact, even for English, not every CP allows deletion of its complement, for instance, *yes-no* question. We do not expect any deletion of TP in a *yes-no* question in which C hosts an auxiliary, such as *[$_{CP}$ C-*Did* [$_{TP}$ ~~*you go to school today*~~]]. Similarly, in a tag question, the subject must appear, for instance, *You didn't go to school, did* ***you***?

(6) PF phasehood diagnostics

a. Does an Att head trigger Spell-Out? Yes, an attitude-related SFP triggers Spell-Out and Transfer. The complement of the Att is a transferrable unit. This point will be demonstrated in detail in sections 3 and 4.

b. Does an AttP determine phonological domains? Yes, both AttP and its complement are phonological units.

(7) LF phasehood diagnostics

Can an element moving out of an AttP be interpreted in the edge position? Yes, as will be shown in section 4.4.

(8) Syntactic phasehood diagnostics

a. Can an element moving out of an AttP be pronounced (partially or completely) at the edge? Yes, this is the case where an AttP and a TopP co-occur (see section 4.4).

b. Is an AttP a domain for feature valuation? Is Att the source of uninterpretable features?

The results in (6-7) support the claim that AttP constitutes a phase. However, (8b) raises interesting questions that need to be addressed. Cross-linguistically, SFPs exhibit agreement in many languages, for instance, SFPs can either Agree with object or with subject or with the speaker in Jingpo (see Dai 2010, examples below are cited from Miyagawa 2017:30).

(9) a. Jongma du hkum **ma-s-ai**.
student arrive complete PL-PERF-3-DECL
'The students have all arrived.' (subject agreement, neutral)

b. Jongma du hkum **sa-ga-ai**.
student arrive complete PERF-1PL-DECL
'The students have all arrived.' (speaker agreement, bonding)

SFPs in these two sentences are C heads and they encode declarative force. The SFP ϕ-agrees with the subject in (9a) but with the speaker in (9b). Miyagawa further proposes that C transmits its ϕ to T in Chinese even if ϕ does not overtly manifest on T in Chinese. Therefore, at least in certain languages, projections headed by SFPs indeed constitute a domain for feature valuation and agreement, and SFPs are the source of unvalued features. I thus conclude that the diagnostic tests support the phasehood of SFPs in Chinese. In the system proposed by Paul (2015), Pan & Paul (2016), Paul & Pan (2017), and Pan (2015, 2019a), all of the peripheral projections "split" from the CP are above TP. In other words, these peripheral heads are C. Even the low S.AspP (sentential aspects) in their sense is above TP.[6] In the present study, I follow the view that low

[6] An anonymous reviewer points out that it is not straightforward why lower peripheral projections, such as sentential aspectual phrase, can also constitute phases. Actually, there are two different aspectual projections in Chinese. TP is higher than AspP. The hierarchy is: S.AspP > TP > AspP > *v*P > VP… In the framework of Principles and Parameters, aspectual suffixes attached to verbs are treated as heads of the projection AspP. Verbs move from V to join Asp to form a complex head by head-movement, as in (i). Different from AspP, the sentential S.AspP is headed by aspect-related SFPs, which take the entire TP (including AspP and *v*P) as complement.

(i) [$_{S.AspP}$ [$_{TP}$ Zhangsan [$_{Asp'}$ [$_{Asp}$ [$_{V}$ qu] [$_{Asp}$ -guo]] [$_{VP}$ t$_{qu}$ Bali]]] le].
Zhangsan go -EXP Paris LE
'It is now the case that Zhangsan has been in Paris.'

peripheral projections, such as S.AspP and *Only*P are in the periphery domain, thus above TP. Here is an example:

(10) Wo xihuan jueshiyue le.
I like Jazz.music LE
(Lit.) 'It is case now that I like Jazz.' → 'I did not like Jazz before.'

Without the sentence final *le*, (10) can only have a present tense reading 'I like Jazz'. However, when *le* is Merged, as shown in (10), the change-of-state reading becomes available. In other words, such a reading is only available when *le* is present. This suggests that *le* has its own semantic interpretation and that its presence is obligatory when the change-of-state reading is needed. This is precisely the point that Pan & Paul (2016) argue for: the presence of SFPs in Chinese is never optional because each specific interpretation can only be assigned to a sentence when the corresponding SFP is present. In addition, when applying diagnostic tests for phases of Citko (2014) to low SFPs such as *le*, we observe that they have exactly the same syntactic behavior as high Attitude particles such as *ne* and *a*. Crucially, in section 4.4.1, I will show that if low projections of SFPs are not phases, the derivation crashes. To my mind convincing, this constitutes a strong argument in favor of their phase status.

2.2 Specifier and EPP

Following the general assumption on phase heads, I assume that the head of each peripheral projection in Chinese should also bear an EPP feature and that its specifier must be projected. EPP can be satisfied by External Merge or by Internal Merge (i.e., Move). Chinese demonstrates the following four strategies to satisfy the EPP attached to peripheral phase heads. The choice of these four strategies partially depends on the availability of an syntactic object that can be Merged (either externally or internally) with the phrase headed by the peripheral phase head.

(11) a. If there is an XP with an overt phonetic or morphological form, which can satisfy the EPP of the phase head C, externally Merge the XP with the CP;[7]

b. otherwise, externally Merge a null operator, which does not have an overt phonetic or morphological form, with the CP to satisfy the EPP on C;[8]

Erlewine (2017) proposes that final aspectual particles and the sentence-final *eryi* 'only' are peripheral elements of *v*P. However, Zhang (2019) specifically shows that "low" sentence-final aspect particles always have a wide scope reading and they take TP as a complement. In addition, I also show in Pan 2019a, b that the main empirical facts in support of the low scope of SFPs discussed by Erlewine (2017) are not related to the scope of SFPs and that the "apparent" low scope of particles is derived.

[7] Based on the free Merge view, any XP can be Merged in the Spec of SFP to satisfy the requirement of the EPP feature. However, Merging any XP will result in deviant structures. According to Chomsky (2008, 2020), syntax only takes care of Merge (external and internal) and the elimination of uninterpretable features, and syntax does not ensure that all of the resulting structures are non-deviant. Syntax can generate deviant structures containing no uninterpretable features and then transfers them to the C-I interface. C-I interface determines whether assigning any specific interpretation to a deviant structure.

[8] Two different types of semantically related operators are distinguished from each other: (a) pure semantic operators which have no position in syntax, such as λ-operator, and, (b) those which can contribute concrete interpretation to a syntactic structure, such as *wh*-operator. Merging a λ-operator at narrow syntax violates the Inclusiveness Condition, which should be avoided; however, merging a *wh*-operator should be allowed given that it satisfies Legibility Conditions at the interface level, which is in accordance with the Strong Minimalist Thesis.

c. otherwise, internally Merge an XP functioning as a Goal with the CP after an Agree relation is established between the Probe-C and the Goal-XP.

d. otherwise, internally Merge the entire complement of the phasal head C with the CP as a last resort to satisfy the EPP.

In (11a), an XP is assembled in an independent workspace, and then it will be externally Merged with the phase to satisfy the EPP feature of the phase head.[9] In (11b), a null operator is assumed to be available in Lexicon. Under the hypothesis that a lexical item is composed of a feature bundle (e.g., phonetic features, semantic features, and syntactic features), a null operator contains semantic features but lacks phonetic features. Cases (11a) and (11b) involve External Merge, which can also be referred to as the base-generation strategy, whereas cases (11c) and (11d) involve Internal Merge. In the case of Internal Merge, the matched Goal XP in (11c) is already present in the structure resulting from the previous Merge operations. The statement in (11) expresses two preferences: the first is that Merge is preferred over Move; and the second is that moving a matched Goal from within the phasal complement is preferred over moving the entire complement XP. Note that the second preference is not due to the economical consideration. Instead, the availability of moving a Goal located inside the complement is determined by the result of the minimal search: this option is only available if a Goal is found bearing the matched features with regard to an active Probe (i.e., the phase head), otherwise moving the entire complement is opted as a last resort. Crucially, the final order of an SFP at the surface is derived by raising the complement to the specifier to satisfy the EPP associated with this SFP.

The assumption that each peripheral phase head has an EPP feature needs further justification. For instance, intermediate C may have an Edge Feature (EF) (see Chomsky 2008), but EF is still different from EPP in that EF is not always satisfied. In the case of successive *wh*-movement, a *wh*-phrase passes through every phase edge. Under the copy theory of movement, we can imagine that the EPP/EF associated with the phase edge is satisfied by the copy of *wh*-phrase. However, this does not explain declarative sentences without Ā-movement. Another case is related to Sentence-Initial Particles found in many languages (Haegeman 2014; Cardinaletti 2015; Sheehan et al. 2017:ch. 9, a.o.). If an initial particle is also assumed to be a C, then it is clear that its specifier is not projected. There are two possible ways to look at this problem. One is that an EPP feature is not systematically available for all the phase heads in all the languages and that its availability is subject to variation. The other possibility is based on Feature Inheritance Hypothesis (Chomsky 2008, Ouali 2008). Each phase can still have an EPP feature but a phase head can transmit its EPP (among other features) to the head that it selects. Whether a given phase head retains a copy of the EPP feature after transmission is subject to variation. In fact, both possibilities strongly rely on the variation of functional heads. For SFPs, we can assume that each of them retains a copy of its EPP feature after transmitting it to T, as shown in (12a). The External Argument (EA) is moved from the Spec of *v*P to the Spec of TP to satisfy the EPP on T. In (12b), the entire TP raises to the Spec of CP to satisfy the EPP on C.

(12) Derivation of final particles

a. [$_{CP}$ **C** [$_{TP}$ EA [$_{TP}$ **T** [$_{vP}$ ~~EA~~ [$_{vP}$ *v* [$_{VP}$ V IA]]]]]]
EPP → EPP

[9] *Workspace* is defined based on "active memory" in Chomsky 2000. In Chomsky, Gallego & Ott 2019, MERGE is assumed to work on syntactic objects placed in a workspace and in Chomsky 2019, MERGE is assumed to work on workspace itself.

b. [$_{CP}$ [$_{TP}$ **EA** [$_{TP}$ **T** [$_{vP}$ ~~**EA**~~ [$_{vP}$ ***v*** [$_{VP}$ **V IA**]]]]] [$_{CP}$ C [~~$_{TP}$ EA [$_{TP}$ T [$_{vP}$ EA [$_{vP}$ *v* [$_{VP}$ V IA]]]]~~]]

In the case of initial particles, we can assume that C does not keep a copy of the EPP after transmitting it to T. In (13), EA raises to the Spec of TP to satisfy the EPP. Since C has no more EPP feature, TP does not raise.

(13) Derivation of initial particles
[$_{CP}$ **C** [$_{TP}$ EA [$_{TP}$ **T** [$_{vP}$ ~~EA~~ [$_{vP}$ *v* [$_{VP}$ V IA]]]]]]
~~EPP~~ → EPP

In sum, I assume that the inheritance of the EPP feature is subject to variation. The difference between being an initial particle and a final particle reduces to "not keeping" versus "keeping" a copy of the EPP feature. For Chinese, SFPs systematically keep a copy of the EPP after transmitting it to T, which is why all of the SFPs are head-final.

3. A Unified Account for the Split CP in Chinese

This section illustrates the four ways to satisfy the EPP feature with concrete examples.

3.1 Externally Merge an XP with the CP to Satisfy the EPP on C

As stated in (11a), an XP is externally Merged with the phase CP, and the EPP on C is therefore satisfied. This is illustrated below in (14).

(14) [$_{CP}$ XP [$_{CP}$ C [WP … [YP [ZP]]]]]
↑ [~~EPP~~]
Merge

This situation corresponds to base-generated topics in Chinese, which are also referred to as dangling topics, "Chinese-style topics" or "Aboutness topics" (Li & Thompson 1976; Badan 2007; Pan & Hu 2008). In such a construction, the Topic head is analyzed as C and there is no Probe-Goal relation involved.[10] The dangling topic phrase is externally Merged with the TopP and as a result, the EPP associated with the Top head is satisfied. Here is a concrete example:

(15) Base-generated topic
[$_{TopP}$ Zhe-ke shu [$_{TopP}$ Top [$_{TP}$ yezi hen da]]].
this-CL tree leaves very big
'As for this tree, (its) leaves are big.'

Another case involves resumptive left-dislocation structures, as shown in (16).

(16) Resumptive left-dislocation structure
[$_{TopP}$ Lu Xun$_i$ [$_{TopP}$ Top [$_{TP}$ wo du-guo [$_{DP}$ [$_{CP}$ *(ta$_i$) xie de] xiaoshuo]]]].
Lu Xun I read-EXP he write C novel
'Lu Xun$_i$, I read the novels that he$_i$ wrote.'

The base-generated topic phrase *Lu Xun* co-refers with the resumptive pronoun *ta* 'he' embedded in a strong island constituted by a relative clause. This type of resumptive pronoun

[10] Generally, topicalization involves an operator-variable dependency in the sense of semantics. Pan & Hu (2008) argue that this type of topic involves a predication relation in a broad sense (i.e., the predicate takes the so-called dangling topic as its argument at the semantic level).

is described as a saving device to redeem a sentence from a potential violation of locality constraints (see Pan 2016 for further discussion on Chinese).

Let us turn to negative *wh*-questions in Chinese (see Cheung 2008; Tsai 2008; Pan 2015, 2019a).

(17) Negative *wh*-questions (NegQP)[11]

[$_{NegQP}$ *Shenme* [$_{NegQP}$ NegQ [$_{TP}$ ta hui tan gangqin]]]?!
what he can play piano

'He can play piano?!' = 'He cannot play piano at all!'

The sentence initial *shenme* 'what' located at the Spec of NegQP is not interpreted as an ordinary *wh*-phrase but as a negative operator, which provides the sentence with a strong negative force. As a result, the sentence is interpreted as a strong negative assertion. At the semantic level, *shenme* 'what' takes scope over the entire sentence without binding any individual variable. At the level of syntax, *shenme* 'what' externally Merges with the NegQP to satisfy the EPP feature on the NegQ head.

3.2 Externally Merge a Null Operator with the CP to Satisfy the EPP on C

(18) [$_{CP}$ Op [$_{CP}$ C [WP … [YP [ZP]]]]]
↑ [~~EPP~~]
Merge

The Op (operator) in (18) does not possess any overt morphological form; however, it contributes a specific interpretation to the sentence. Chinese is a *wh*-in-situ language and *wh*-phrases do not overtly move to the Spec of CP to derive a question; instead, they stay in their base-position. Tsai (1994) proposes that an in-situ *wh*-argument is always unselectively bound by a null interrogative operator Op, which is generated at the Spec of CP. In my system, it is important to maintain that Op is not an iForce head but is at the Spec of iForceP, satisfying the EPP, as shown in (19). If Op is Merged as an iForce head binding a *wh*-phrase, the latter would need to move to the Spec of iForceP to satisfy the EPP of the iForce head, contrary to the fact as Chinese does not have *wh*-movement.

(19) [$_{iForceP}$ Op(x) [$_{iForceP}$ iForce [$_{TP}$ Zhangsan xihuan chi shenme(x)]]]?
Zhangsan like eat what

'What does Zhangsan like eating?'

Example (20) involves two peripheral projections: TopP and iForceP. The *wh*-topic phrase *na-zhong shu* 'what kind of tree' at the Spec of TopP satisfies the EPP of the topic head (see Pan 2014 for *wh*-topics). The null Op at the Spec of iForceP satisfies the EPP of the iForce head. Both EPP features are satisfied by external Merge.

(20) Base-generated *wh*-topic

[$_{iForceP}$ Op(x) [$_{iForceP}$ iForce [$_{TopP}$ Na-zhong shu($_{x}$) [$_{TopP}$ Top [$_{TP}$ yezi hen da]]]]]?
which-kind tree leaves very big

'For what kind of tree, is it the case that (its) leaves are big?'

[11] This type of negative question with the sentence-initial *shenme* 'what' is only produced in spoken Chinese with a strong stress on *shenme*. The acceptability of this type of question varies among speakers from different regions in China.

3.3 Internally Merge an XP Functioning as a Goal with the CP after an Agree Relation Is Established between the Probe-C and the Goal-XP

(21) [$_{CP}$ XP [$_{CP}$ C [WP … [YP [~~XP~~]]]]]
[~~EPP~~]

This case corresponds to structures involving an overt Ā-movement such as topicalization derived by movement, as in (22). The Agree relation is established between the topic head (Probe) and *this novel* (Goal), and the topic phrase undergoes movement to the Spec of TopP to satisfy the EPP.

(22) Topicalization derived by movement
[$_{TopP}$ Zhe-bu xiaoshuo$_j$ [$_{TopP}$ Top [$_{TP}$ Zhangsan yijing kan-wan-le t$_j$]]].
this-CL novel Zhangsan already read-finish-PERF
'This novel, I have already finished reading.'

3.4 Internally Merge the Entire Complement of C with the CP to Satisfy the EPP on C as a Last Resort

As illustrated in (23), when there is not any available XP or null operator, which can be directly Merged with the CP, or, any potential Goal, which can be moved to the Spec of CP, the entire complement of the phasal head, [WP … [YP [ZP]]] in this case, will raise to the Spec of CP to fulfill the requirement of the EPP on C, as a last resort.

(23) [$_{CP}$ **[WP … [YP [ZP]]]** [$_{CP}$ C ~~[WP … [YP [ZP]]]~~]]
Move

SFPs in Chinese can take a TP as complement and importantly, they do not function as Probes and do not require any Goal to establish an Ā-dependency through Agree. Since no potential candidate can satisfy the EPP feature associated with these SFPs, the entire complement TP raises to the Spec as a last resort. Previously, analyses based on the complement-to-specifier movement have been proposed to derive the final order of SFPs in Chinese (see Tang 1998, Sybesma 1999, Julien 2002, Simpson & Wu 2002, Takita 2009, Hsieh & Sybesma 2011). Tang (1998:ch. 2, p. 49) briefly discusses the possibility of raising the complement of C to its specifier so as to derive the final order of SFPs. However, even if the word order can be derived in this way, conforming with the Linear Correspondence Axiom (LCA) (see Kayne 1994), the motivation of such a raising of the entire clause remains unclear. For Kayne (1994), linear order is determined by the LCA (see 24 for a simplified version).

(24) Linear Correspondence Axiom (LCA)
Where X, Y, and Z are terminal elements (lexical items), X precedes Y if and only if X asymmetrically c-commands Y, or X is dominated by Z, and Z asymmetrically c-commands Y.

Importantly, a head X will precede its complement YP (because it asymmetrically c-commands the constituents of YP), unless YP moves higher. In the theory articulated in Chomsky 1995:ch. 4, 2000, 2001, and 2019, Merge does not determine linear order. Let us assume that an Att(itude) head Merges with a TP to form a set labelled by Att: {Att, TP}. This set has an order (when spelled out): Att precedes TP. Under our analysis, Att is a phase head and it has an EPP feature. Note that an Att particle does not function as a Probe and that it does not need any

Goal to establish an Agree chain. Since there is no Probe-Goal relation, there is no Goal, which can be moved to satisfy the EPP on the Att head. As a result, the entire complement of the phasal head Att raises to the specifier to satisfy the EPP. Therefore, TP is moved to the Spec of Att: {TP, {Att, ~~TP~~}}. Given the LCA, the TP is spelled out preceding Att, yielding the final order of the Att head.[12]

3.5 Cross-Linguistic Evidence

Particles related to speech acts are referred to as discourse particles, which exist in many languages. These particles head independent functional projections (see Munaro & Poletto 2002, for Italian dialects; Hill 2007 for vocative particles; Haegeman 2014 for West Flemish particles; Haegeman & Hill 2013; Biberauer, Haegeman & Kemenade 2014). Munaro & Poletto (2002) propose that discourse-related sentence-final particles, as initial-heads, attract their clausal complement to the specifier position. This view is also shared in my analysis of Chinese SFPs. Crucially, my analysis offers a theoretical motivation for this comp-to-spec movement. As emphasized in the previous section, this movement is not systematic and it can only be required as a last resort when no alternative way is available to satisfy the EPP feature.

3.6 Summary

Results of the tests on each type of functional projection in the left-periphery are presented in Table 2.

Table 2 Properties of peripheral projections

Projections		***SFPs as heads?***	***Probe-Goal relation?***	***Candidate for Spec?***	
TopP	Gapless dangling topics	no	no	yes	Merged XP
	Resumptive left-dislocation	no	yes	yes	Merged XP
	Topicalization	no	yes	yes	Moved XP
iForceP	- *wh*-question	no	yes	yes	Null Op-*wh*
SQP	NegQP	no	no	yes	*Shenme* 'what'
S.AspP	*laizhe*, *le*	yes	no	no	Complement-to-specifier raising
Only**P	*eryi*, *bale*	yes	no	no	
iForceP	- *yes-no* question: *ma*	yes	no	no	
	- imperative: *ba2*	yes	no	no	
AttP	*ne*, *a*, *ya*, *ba3*, and so on.	yes	no	no	

Based on these properties demonstrated by each type of projection, the following generalizations can be drawn. First, each peripheral head bears an EPP feature. Second, none of the derived head-final projections, for instance S.AspP, *Only*P, iForceP (*yes-no* questions, imperatives), and AttP, involves a Probe-Goal relation; consequently, there is no candidate XP

[12] As noted by an anonymous reviewer, one should not have an impression that all pronounced C-heads are final. There is a pronounced subordinate head-initial complementizer in many varieties of Chinese: *shuo* 'say' (see Simpson & Wu 2002, Su 2004, Hsieh & Sybesma 2011). Here is an example.

(i) Wo xiang shuo Zhangsan mingtian kending hui lai.
I think say Zhangsan tomorrow certainly will come
'I think that Zhangsan will certainly come tomorrow.'

Since *shuo* 'say' can only be a subordinate C rather than a root C, it could be the case that it does not bear any EPP feature; instead, it has an Edge Feature, which is associated with any intermediate C head (see Chomsky 2008). In the case of successive cyclic *wh*-movement, the relevant *wh*-word stops at the Spec of every intermediate C to satisfy the Edge Feature.

to satisfy the EPP feature in these projections. Their heads can take a TP as complement and can provide such a TP with a specific interpretation. Semantically, they scope over the entire TP and syntactically, they do not Agree with any particular constituent inside the TP. As a result, the entire complement must raise to the Spec of each phasal head to satisfy the EPP. Third, this comp-to-spec movement is only a last resort to satisfy the EPP feature.

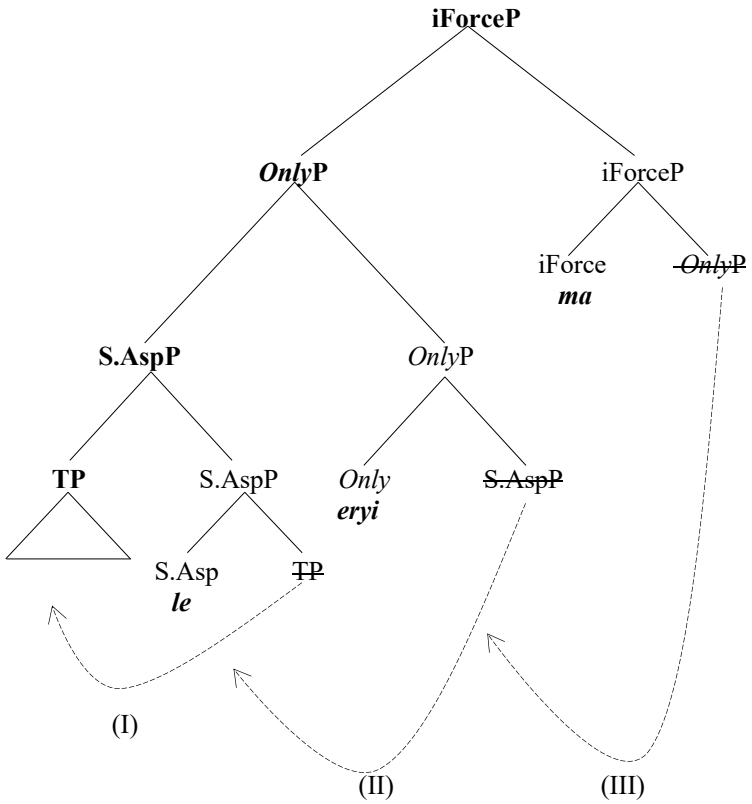
4. Complex Cases

This section examines the derivation of cases where several peripheral functional projections co-occur in the same sentence. I will start by examining the case involving projections hosting SFPs only, and then the case involving both the projections that require a comp-to-spec movement and those which do not require this movement.

4.1 Cases Involving a Cooccurrence of Several SFPs

Recall the example in (2e), which involves three SFPs. Below is the tree diagram with a step-by-step derivation.

(25)



Step 1: In the lowest cycle, S.Asp-*le* Merges with the TP-*ta zhibuguo bu he yingshi hongcha* 'she does not drink English black tea'. Since S.AspP does not involve any Probe-Goal relation and there is no suitable Goal available for satisfying the EPP feature on S.Asp-*le*, the entire complement, namely TP, internally Merges with the S.AspP to satisfy the EPP.

(26) [$_{S.AspP}$ [$_{TP}$ ***she does not drink English black tea***] [$_{S.AspP}$ S.Asp-***le*** [~~$_{TP}$ *she does not drink English black tea*~~]]]

Step 2: The exclusive focus head *eryi* 'only' Merges with the S.AspP. The domain of the lower phase S.AspP (i.e., the lower copy of TP) is transferred to the interfaces.[13]

(27) [$_{Only\text{P}}$ *Only-**eryi*** [$_{\text{S.AspP}}$ [$_{\text{TP}}$ ***she does not drink English black tea***] [$_{\text{S.AspP}}$ S.Asp-***le*** ~~[$_{\text{TP}}$ *she does not drink English black tea*]~~]]]

Step 3: Again, as S.AspP, *Only*P does not involve any Probe-Goal relation and therefore, there is no suitable candidate available to satisfy the EPP feature on *eryi* 'only'. As a result, the entire complement, S.AspP, internally Merges with the *Only*P to satisfy the EPP on *eryi*.

(28) [$_{Only\text{P}}$ [$_{\text{S.AspP}}$ [$_{\text{TP}}$ ***she does not drink English black tea***] [$_{\text{S.AspP}}$ S.Asp-***le*** ~~[$_{\text{TP}}$ *she does not drink English black tea*]~~]] [$_{Only\text{P}}$ *Only-**eryi*** ~~[$_{\text{S.AspP}}$ [$_{\text{TP}}$ *she does not drink English black tea*] [$_{\text{S.AspP}}$ S.Asp-***le*** [$_{\text{TP}}$ *she does not drink English black tea*]]]~~]]

Step 4: In the highest cycle, the *yes-no* question particle *ma* Merges with the *Only*P; the complement of the *Only* head (i.e., the lower copy of the S.AspP) is transferred to the interfaces.

(29) [$_{\text{iForceP}}$ iForce-***ma*** [$_{Only\text{P}}$ [$_{\text{S.AspP}}$ [$_{\text{TP}}$ ***she does not drink English black tea***] [$_{\text{S.AspP}}$ S.Asp-***le*** ~~[$_{\text{TP}}$ *she does not drink English black tea*]~~]] [$_{Only\text{P}}$ *Only-**eryi*** ~~[$_{\text{S.AspP}}$ [$_{\text{TP}}$ *she does not drink English black tea*] [$_{\text{S.AspP}}$ S.Asp-***le*** [$_{\text{TP}}$ *she does not drink English black tea*]]]~~]]]

Step 5: Since no candidate can satisfy the EPP feature on the iForce-*ma* head, as a result, the entire complement, *Only*P, internally Merges with the iForceP to satisfy the EPP, yielding the final spelled-out order, TP < *le* < *eryi* < *ma*.

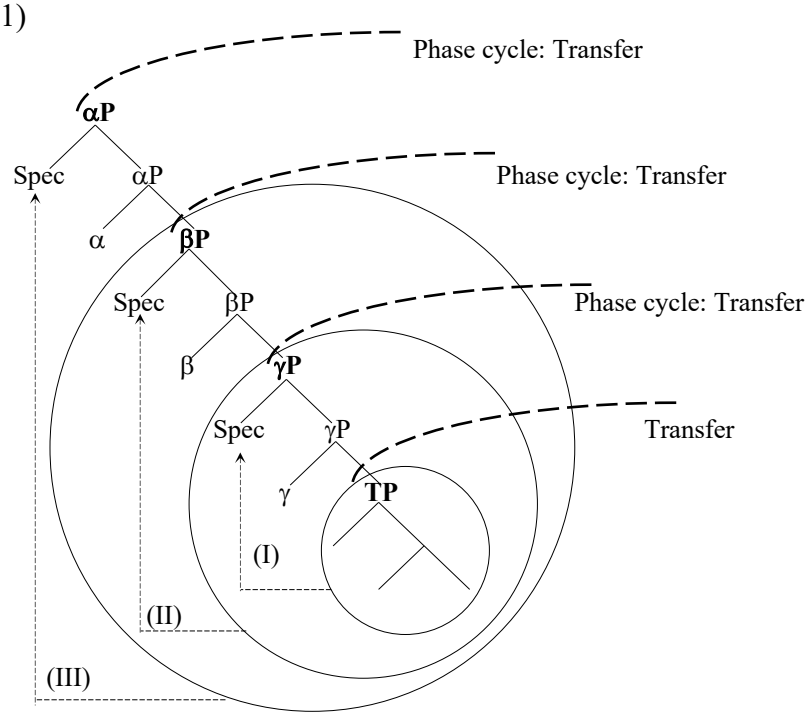
(30) [$_{\text{iForceP}}$ [$_{Only\text{P}}$ [$_{\text{S.AspP}}$ [$_{\text{TP}}$ ***She does not drink English black tea***] [$_{\text{S.AspP}}$ S.Asp-***le*** ~~[$_{\text{TP}}$ *she does not drink English black tea*]~~]] [$_{Only\text{P}}$ *Only-**eryi*** ~~[$_{\text{S.AspP}}$ [$_{\text{TP}}$ *she does not drink English black tea*] [$_{\text{S.AspP}}$ S.Asp-***le*** [$_{\text{TP}}$ *she does not drink English black tea*]]]~~]] [$_{\text{iForceP}}$ iForce-***ma*** ~~[$_{Only\text{P}}$ [$_{\text{S.AspP}}$ [$_{\text{TP}}$ *she does not drink English black tea*] [$_{\text{S.AspP}}$ S.Asp-***le*** [$_{\text{TP}}$ *she does not drink English black tea*]]] [$_{Only\text{P}}$ *Only-**eryi*** [$_{\text{S.AspP}}$ [$_{\text{TP}}$ *she does not drink English black tea*] [$_{\text{S.AspP}}$ S.Asp-***le*** [$_{\text{TP}}$ *she does not drink English black tea*]]]]]~~]]

Step 6: When the derivation reaches the end, the entire sentence is transferred to the interfaces.

A general derivation of the configuration involving several SFPs is presented in (31): α, β, and γ are three types of SFPs, each of which heads a phase. The surface order is TP < γ < β < α.

[13] The elements struck out are lower copies after movement rather than transferred elements.

(31)



4.2 Cooccurrence of an Embedded SFP and a Root SFP

In Pan 2015, 2019a, I show that lower SFPs related to the sentential aspect can be embedded, whereas higher particles related to the speaker's attitude or subjective opinion cannot appear in embedded clauses. Lower SFPs can head embedded clauses. This distinction is captured by The Subjectivity Scale Constraint: the higher a peripheral projection is located, the more subjective the interpretation of such a projection becomes, the less likely it is for such a projection to be embedded.

(32) Zhangsan xiangxin [wo bu ai ta le] ma?
Zhangsan believe I NEG love him LE Q*yes-no*
'Does Zhangsan believe that I no longer love him?'[14]

In (32), the sentential aspectual particle *le* is embedded within a subordinate clause and it takes the embedded TP-*I don't love him* as its complement. The particle *le* provides the TP with a change-of-state reading 'I no longer love him'. The *yes-no* question particle *ma* takes the matrix TP as its complement, which yields a root *yes-no* question reading. The major steps of the derivation are given below:

Step 1: Merge S.Asp-*le* with the embedded TP-*I don't love him*. And then, the TP internally Merges with the S.AspP to satisfy the EPP on the S.Asp-*le*.

(33) [S.AspP [TP ***I don't love him***] [S.AspP S.Asp-***le*** ~~[TP *I don't love him*]~~]]

[14] Another possible parsing is that both *le* and *ma* appear in the root clause, which yields the reading 'Does Zhangsan believe now that I do not love him?' with the assumption that 'Zhangsan does not believe it before.'

Step 2: Merge V-*believe* with the S.AspP to form a VP. Then, *v* is Merged with the VP to form a *v*P. The verb *believe* raises to *v*. *Zhangsan* is externally Merged with the *v*P. Then the matrix T is Merged with the *v*P. T Agrees with *Zhangsan* in terms of ϕ-feature and *Zhangsan* raises to the Spec of TP to satisfy the EPP on T.

(34) [$_{TP}$ ***Zhangsan*** [$_{TP}$ T [$_{vP}$ ~~***Zhangsan***~~ [$_{vP}$ ***v-believe*** [$_{VP}$ V-~~***believe***~~ [$_{S.AspP}$ [$_{TP}$ ***I don't love him***] [$_{S.AspP}$ S.Asp-***le*** ~~[$_{TP}$ *I don't love him*]~~]]]]]]]

Step 3: Merge iForce-*ma* with the matrix TP-*Zhangsan believes that I no longer love him*. And then, the matrix TP internally Merges with the iForceP to satisfy the EPP on iForce-*ma*.

(35) [$_{iForceP}$ [$_{TP}$ ***Zhangsan*** [$_{TP}$ T [$_{vP}$ ~~***Zhangsan***~~ [$_{vP}$ ***v-believe*** [$_{VP}$ V-~~***believe***~~ [$_{S.AspP}$ [$_{TP}$ ***I don't love him***] [$_{S.AspP}$ S.Asp-***le*** ~~[$_{TP}$ *I don't love him*]~~]]]]]]]] [$_{iForceP}$ **iForce-*ma*** ~~[$_{TP}$ *Zhangsan* [$_{TP}$ T [$_{vP}$ *Zhangsan* [$_{vP}$ *v-believe* [$_{VP}$ V-*believe* [$_{S.AspP}$ [$_{TP}$ ***I don't love him***] [$_{S.AspP}$ S.Asp-***le*** [$_{TP}$ *I don't love him*]]]]]]]]~~]]

4.3 Cases with Overt and Covert Heads

In this section, I will examine cases with both overt heads and covert heads. The following example involves four different projections:

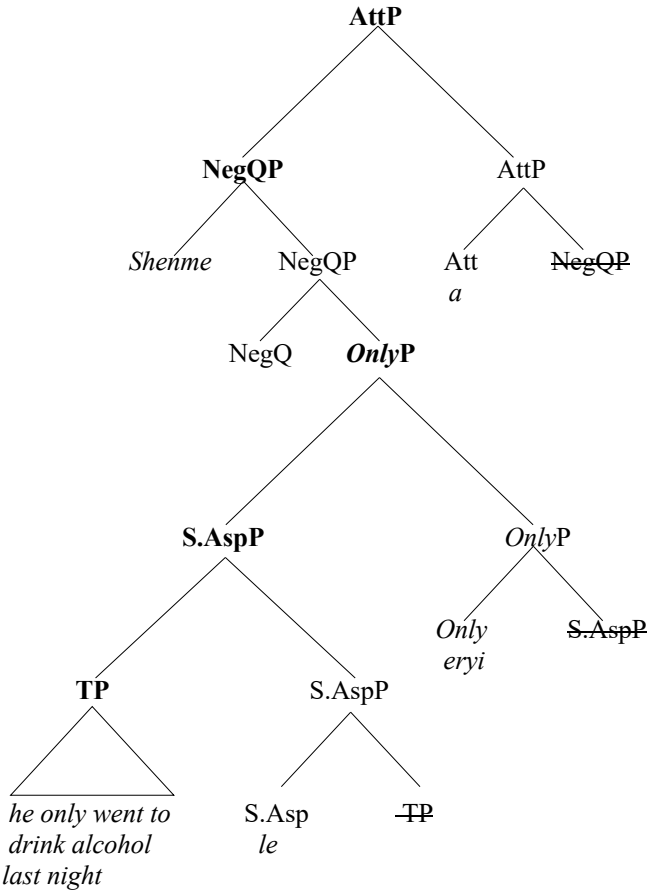
(36) Hierarchy: AttP (*a*) > NegQP (*shenme* 'what') > *Only*P (*eryi*) > S.AspP (*le*) > TP

Shenme	ta	zuowan	zhi	qu	he	jiu	**le**	**eryi**	**a**!
what	he	last.night	just	go	drink	alcohol	LE	ERYI	A

'Oh, it is not true that it is not a big deal that he went to drink alcohol last night! (He is not supposed to go outside at all!)'

In this sentence, the NegQ head has an initial order. The sentence-initial *wh*-phrase *shenme* 'what', located at the Spec of NegQ, provides the entire sentence with a strong negative meaning. Conversely, S.Asp, *Only*, and Att heads have a final order. In this case, word order cannot help us to determine the hierarchy between them; instead, we should examine the interpretation of these projections in terms of the scope relation. The entire sentence is understood as a strong negative assertion, but such a negative interpretation is still under the scope of the speaker's subjective attitude particle *a*. Therefore, Att-*a* necessarily takes a wide scope over the NegQP. It follows that the NegQ head scopes over the *Only*P and the S.AspP. The tree diagram with a step-by step derivation is given below.

(37)



Step 1: Merge the head S.Asp-*le* with the TP. Then, internally Merge the TP with the S.AspP to satisfy the EPP on the head S.Asp-*le*.

(38) [S.AspP [TP ***he only went to drink alcohol last night***] [S.AspP S.Asp-***le*** ~~[TP *he only went to drink alcohol last night*]~~]]

Step 2: Merge the head *Only-eryi* with the S.AspP. The domain of the S.AspP phase (i.e., the lower copy of the TP) is transferred to the interfaces. Then, internally Merge the S.AspP with the *Only*P to satisfy the EPP on *Only-eryi*.

(39) [*Only*P [S.AspP [TP ***he only went to drink alcohol last night***] [S.AspP S.Asp-***le*** ~~[TP *he only went to drink alcohol last night*]~~]] [*Only*P *Only-**eryi*** ~~[S.AspP [TP *he only went to drink alcohol last night*] [S.AspP S.Asp-***le*** [TP *he only went to drink alcohol last night*]]]~~]]

Step 3: The negative question head NegQ is Merged with the *Only*P. The domain of the lower phase *Only*P (i.e., the lower copy of the S.AspP) is transferred.

(40) [NegQP NegQ [*Only*P [S.AspP [TP ***he only went to drink alcohol last night***] [S.AspP S.Asp-***le*** ~~[TP *he only went to drink alcohol last night*]~~]] [*Only*P *Only-**eryi*** ~~[S.AspP [TP *he only went to drink alcohol last night*] [S.AspP S.Asp-***le*** [TP *he only went to drink alcohol last night*]]]~~]]]

Step 4: *Shenme* 'what' with its strong negative meaning is available, and it is externally Merged with the NegQP to satisfy the EPP feature of the NegQ head. Since the EPP is satisfied, the complement of the NegQ (i.e., the *Only*P) no longer needs to raise.

(41) [NegQP ***shenme*** [NegQP NegQ [*Only*P [S.AspP [TP ***he only went to drink alcohol last night***] [S.AspP S.Asp-***le*** ~~[TP *he only went to drink alcohol last night*]~~]] [*Only*P ***Only-eryi*** ~~[S.AspP [TP *he only went to drink alcohol last night*] [S.AspP S.Asp-**le** [TP *he only went to drink alcohol last night*]]]~~]]]]

Step 5: In the highest cycle, Merge the head Att-*a* with the NegQP. The domain of the NegQP phase (i.e., the lower copy of the *Only*P) is transferred to the interfaces. Since there is no potential candidate to satisfy the EPP feature on the head Att-*a*, the entire complement of Att (i.e., NegQP) internally Merges with the AttP to satisfy the EPP on Att-*a*, yielding the final order given the LCA: *shenme* 'what' < TP < *le* < *eryi* < *a*.

(42) [AttP [NegQP ***Shenme*** [NegQP NegQ [*Only*P [S.AspP [TP ***he only went to drink alcohol last night***] [S.AspP S.Asp-***le*** ~~[TP *he only went to drink alcohol last night*]~~]] [*Only*P ***Only-eryi*** ~~[S.AspP [TP *he only went to drink alcohol last night*] [S.AspP S.Asp-**le** [TP *he only went to drink alcohol last night*]]]~~]]]] [AttP Att-***a*** ~~[NegQP **Shenme** [NegQP NegQ [*Only*P [S.AspP [TP *he only went to drink alcohol last night*] [S.AspP S.Asp-**le** [TP *he only went to drink alcohol last night*]]]~~ ~~[*Only*P *Only-**eryi*** [S.AspP [TP *he only went to drink alcohol last night*] [S.AspP S.Asp-**le** [TP *he only went to drink alcohol last night*]]]]]]]~~]]

Step 6: The final transfer of the rest of the sentence.

4.4 Cases Involving Topics

4.4.1 TopP > S.AspP > TP

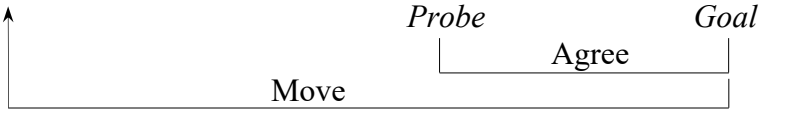
Cases involving topics derived by movement, as in (43), pose a potential problem. If a lower peripheral projection such as S.AspP were treated as a phase, it would block the movement of a topic from *v*P to the C-domain. In fact, we need two assumptions to make the derivation work. First, we need the assumption that the outer Spec of *v*P is an Ā-position, which is an intermediate landing site for Ā-movement (see Chomsky 2000). Second, we need the version of the Phase Impenetrability Condition in Chomsky 2001.

(43) [TopP *Na-bi* *jingfei*$_j$, [S.AspP [TP zhengfu yao pi t_j] **le**]].
that-CL fund government will approve LE
'As for the fund, the government will approve (it)'

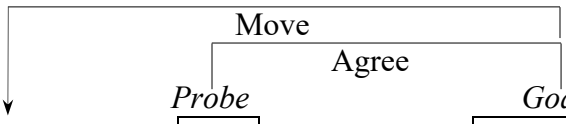
The step-by-step derivation is presented as follows:

Step 1: Merge *v* with the VP-*approve the fund*. Then V-*pi* 'approve' raises to join *v*. Next, externally Merge the subject *zhengfu* 'government' with the *v*P to satisfy the EPP on *v*. Note that the subject *government* is at the inner specifier of the *v*P. Agree is established between the Probe-*v* and the Goal-*the fund*, and the Case feature on *the fund* is deleted. Then, internally Merge *the fund* with the *v*P. Note that the outer specifier position of *v* is an Ā-position.

(44) [*v*P ***the fund*** [*v*P *the government* [*v*P ***v-approve*** [VP ~~*approve*~~ ~~***the fund***~~]]]]



Step 2: Merge T-*yao* 'will' with the *v*P. Agree is established between the Probe-T and the Goal-*zhengfu* 'government', and the Case on *the government* is deleted. Then, internally Merge *government* with the TP to satisfy the EPP on T.



(45) [TP ***the government*** [TP **T-*will*** [*v*P *the fund* [*v*P ~~*the government*~~ [*v*P *v-approve* [VP ~~*approve the fund*~~]]]]]]

Step 3: Merge S.Asp-*le* with the TP. Since S.Asp is a phase head, transfer the domain of the lower phase *v*P (i.e., VP) to the interfaces.

(46) [S.AspP S.Asp-***le*** [TP *the government* [TP T-*will* [*v*P *the fund* [*v*P ~~*the government*~~ [*v*P *v-approve* [VP ~~*approve the fund*~~]]]]]]]

Note that *the fund* is at the outer Spec of *v*P, which is an "escape hatch"; as a result, *the fund* has not been transferred to the interfaces.

Step 4: Internally Merge the TP with the S.AspP to satisfy the EPP of S.Asp-*le* as a last resort.

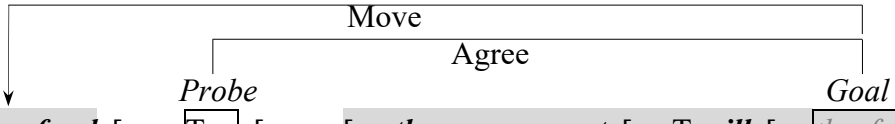
(47) [S.AspP [TP ***the government*** [TP T-***will*** [*v*P ***the fund*** [*v*P ~~*the government*~~ [*v*P ***v-approve*** [VP ~~*approve the fund*~~]]]]]] [S.AspP S.Asp-***le*** [~~TP *the government* [TP T-*will* [*v*P *the fund* [*v*P *the government* [*v*P *v-approve* [VP *approve the fund*~~]]]]]]]]

Step 5: Merge the Top head with the S.AspP. Since Top is also a phase head, it is at this moment that the complement of the phase head S.Asp (i.e., the lower copy of TP) is transferred.

(48) [TopP Top [S.AspP [TP ***the government*** [TP T-***will*** [*v*P ***the fund*** [*v*P ~~*the government*~~ [*v*P ***v-approve*** [VP ~~*approve the fund*~~]]]]]] [S.AspP S.Asp-***le*** [~~TP *the government* [TP T-*will* [*v*P *the fund* [*v*P *the government* [*v*P *v-approve* [VP *approve the fund*~~]]]]]]]]]

Importantly, the entire TP containing *the fund* is still at the Spec of S.AspP, which is an "escape hatch"; as a result, *the fund* has not been transferred to the interfaces.

Step 6: Agree is established between the Probe-Top and the Goal-*the fund* and then, internally Merge the Goal-*the fund* with the TopP to satisfy the EPP on the Top head. This is a standard A-Ā-Ā movement.



(49) [TopP ***The fund*** [TopP Top [S.AspP [TP ***the government*** [TP T-***will*** [*v*P ~~*the fund*~~ [*v*P ~~***the government***~~ [*v*P ***v-approve*** [VP ~~*approve the fund*~~]]]]]] [S.AspP S.Asp-***le*** [~~TP *the government* [TP T-*will* [*v*P *the fund* [*v*P *the government* [*v*P *v-approve* [VP *approve the fund*~~]]]]]]]]]]

Step 7: The final transfer of the rest of the sentence to the interfaces.

Recall that Citko's (2014) phasehood diagnostics were applied to test whether projections headed by SFPs in Chinese constitute phases (see section 2.1). We need to check whether an

element moving out of the XP in question can be pronounced (partially or completely) at the edge. Given Step 6 (see 49), the answer is yes. The moved TP is pronounced at the edge of S.AspP. More importantly, this also supports the claim that lower peripheral projections such as S.AspP are phases in Chinese, since they behave in the same way as highest Attitude particles such as *ne* and *la*.

(50) Zhe-ben shu$_j$, wo du-guo san-bian t_j ne / la!
this-CL book I read-EXP three-times SFP
'As for this book, I have already read (it) three times!'

Here is another piece of evidence based on the derivation of a base-generated topic structure.

(51) Zhe-ke shu, yezi bu duo [$_{S.Asp}$ le].
this-CL tree leaves NEG many LE
'(As for) this tree, (its) leaves are no longer many.'

Let us start the derivation by assuming that S.AspP is not a phase. If S.AspP is not a phase, then *this tree* and S.AspP should belong to the same phase (i.e., TopP).

Step 1: Merge S.Asp-*le* with the TP.

(52) [$_{S.AspP}$ S.Asp-*le* [$_{TP}$ leaves are not many]]

If S.AspP is not a phase and has no EPP feature, the correct order then cannot be derived since TP is located on the right side of *le*, given the LCA. Let us further suppose that S.AspP has an EPP feature but still does not constitute its own phase (i.e., S.AspP and *this tree* are still in the same phase). Then the specifier of the S.AspP must be projected. In the present example, there is a perfect candidate, which can satisfy the EPP on the S.Asp head: *this tree*. This is because *this tree* and theS.AspP are in the same phase.[15] According to the preference of Merge over Move, *the tree* will be Merged, which will prevent TP from moving to the Spec of S.AspP.

Step 2: Merge *this tree* to satisfy the EPP of S.AspP.

(53) [$_{S.AspP}$ *this tree* [$_{S.AspP}$ S.Asp-*le* [$_{TP}$ *leaves are not many*]]]

Step 3: Merge the Top head.

(54) [$_{TopP}$ Top [$_{S.AspP}$ *this tree* [$_{S.AspP}$ S.Asp-*le* [$_{TP}$ *leaves are not many*]]]]

Step 4: Agree Top with *this tree*, and then move *this tree* to the Spec of TopP to satisfy the EPP of the Top head.

(55) *[$_{TopP}$ *this tree* [$_{TopP}$ Top [$_{S.AspP}$ ~~*this tree*~~ [$_{S.AspP}$ S.Asp-*le* [$_{TP}$ *leaves are not many*]]]]]

The derivation crashes. We are led to conclude that the correct derivation must rely on the assumption that *this tree* and S.AspP belong to different phases; in other words, S.AspP must be a phase itself. Below is the correct derivation.

[15] Under the assumption that each phase corresponds to a sub Lexical Array (see Chomsky 2000), *this tree* and the S.AspP belong to the same subarray.

Step 1: Merge S.Asp-*le* with the TP

(56) [$_{S.AspP}$ S.Asp-*le* [$_{TP}$ *leaves are not many*]]

Step 2: Since *this tree* is not available in the phase S.AspP, no candidate can satisfy the EPP on the S.Asp head; therefore, move the TP to the Spec of S.AspP to satisfy the EPP as a last resort.

(57) [$_{S.AspP}$ [$_{TP}$ ***leaves are not many***] [$_{S.AspP}$ S.Asp-***le*** ~~[$_{TP}$ *leaves are not many*]~~]]

Step 3: Merge the Top head with the S.AspP. Transfer the lower copy of the TP.

(58) [$_{TopP}$ Top [$_{S.AspP}$ [$_{TP}$ ***leaves are not many***] [$_{S.AspP}$ S.Asp-***le*** ~~[$_{TP}$ *leaves are not many*]~~]]]

Step 4: Externally Merge *this tree* to satisfy the EPP of the Top head.

(59) [$_{TopP}$ *this tree* [$_{TopP}$ Top [$_{S.AspP}$ [$_{TP}$ ***leaves are not many***] [$_{S.AspP}$ S.Asp-***le*** ~~[$_{TP}$ *leaves are not many*]~~]]]]

Note that there is no essential difference between lower SFPs and higher SFPs in terms of syntactic properties: all of them can be displaced, selected, and all of them are prosodically isolable and their size can be as big as CP in languages like English. The sentence remains fully grammatical when the lower particle *le* is replaced by higher Attitude particles, such as *a*, *lei*, and *ou* (see 60). This is a strong argument in favor of the assumption that all SFPs, lower or higher, project phases.

(60) Zhe-ke shu, yezi bu duo [$_{Att}$ a / lei / ou]!
this-CL tree leaves NEG many SFP
'(As for) this tree, (its) leaves are not many!'

4.4.2 NegQP > TopP > S.AspP > TP

Let us examine another case in which a moved topic phrase lands between two core projections. Such an example is given in (61), a continuation from the resulting TopP in (43): at the surface, the topic DP *the fund* is moved to a position between the S.AspP headed by *le* and the NegQP with the sentence-initial *shenme* 'what'.

(61) Hierarchy: NegQP (*shenme*) > Topic phrase (*the fund*) > S.AspP (*le*) > TP
[$_{NegQP}$ **Shenme** [$_{TopP}$ *na-bi jingfei*$_j$, [$_{S.AspP}$ [$_{TP}$ zhengfu yao pi t$_j$] **le**]]]!
what that-CL fund government will approve LE
'It is not true that the government will approve the fund!'

We can continue the derivation based on (49) of Step 6.

Step 7: Merge the phase head NegQ with the TopP and transfer the domain of the lower phase TopP (i.e., S.AspP) to the interfaces.

(62) [$_{NegQP}$ NegQ [$_{TopP}$ ***the fund*** [$_{TopP}$ Top [$_{S.AspP}$ [$_{TP}$ ***the government*** [$_{TP}$ T [$_{vP}$ ~~*the fund*~~ [$_{vP}$ ~~*the government*~~ [$_{vP}$ ***v-approve*** [$_{VP}$ ~~*approve the fund*~~]]]]]] [$_{S.AspP}$ S.Asp-***le*** ~~[$_{TP}$ *the government* [$_{TP}$ T [$_{vP}$ *the fund* [$_{vP}$ *the government* [$_{vP}$ *v-approve* [$_{VP}$ *approve the fund*]]]]]]~~]]]]]

Step 8: Merge the negative *wh*-word *shenme* 'what' with the NegQP to satisfy the EPP feature on NegQ.

(63) [$_{NegQP}$ ***Shenme*** [$_{NegQP}$ NegQ [$_{TopP}$ ***the fund*** [$_{TopP}$ Top [$_{S.AspP}$ [$_{TP}$ ***the government*** [$_{TP}$ T [$_{vP}$ *the fund* [$_{vP}$ *the government* [$_{vP}$ ***v-approve*** [$_{VP}$ *approve the fund*]]]]]] [$_{S.AspP}$ S.Asp-***le*** [$_{TP}$ *the government* [$_{TP}$ T [$_{vP}$ *the fund* [$_{vP}$ *the government* [$_{vP}$ *v-approve* [$_{VP}$ *approve the fund*]]]]]]]]]]]

Step 9: Transfer the rest of the sentence to the interfaces.

4.4.3 *TopP (Derived by Movement) > NegQP > S.AspP > TP

It is important to note that no topic phrase can be extracted from the complement of the NegQ head. This is because the Spec of NegQP is occupied by the negative *wh*-phrase *shenme* 'what', so this position is no longer available as an escape hatch for any Ā-movement. This prediction is indeed borne out.

(64) Hierarchy: *Top phrase (*the fund*) > NegQP (*shenme*) > S.AspP (*le*) > TP

*[$_{TopP}$ *Na-bi* *jingfei*$_j$, [$_{NegP}$ **shenme** [$_{S.AspP}$ [$_{TP}$ zhengfu yao pi t$_j$] **le**]]]!

that-CL fund what government will approve LE

('As for the fund, it is not true that the government will approve (it)!')

We can continue the derivation based on (47) of Step 4.

Step 5: Merge the phase head NegQ with the S.AspP and transfer the domain of the lower phase S.AspP (i.e., TP).

(65) [$_{NegQP}$ NegQ [$_{S.AspP}$ [$_{TP}$ ***the government*** [$_{TP}$ T [$_{vP}$ ***the fund*** [$_{vP}$ *the government* [$_{vP}$ ***v-approve*** [$_{VP}$ *approve the fund*]]]]]] [$_{S.AspP}$ S.Asp-***le*** [$_{TP}$ *the government* [$_{TP}$ T [$_{vP}$ *the fund* [$_{vP}$ *the government* [$_{vP}$ *v-approve* [$_{VP}$ *approve the fund*]]]]]]]]]

Step 6: Merge the negative *wh*-word *shenme* 'what' with the NegQP, which satisfies the EPP feature of the NegQ head.

(66) [$_{NegQP}$ ***Shenme*** [$_{NegQP}$ NegQ [$_{S.AspP}$ [$_{TP}$ ***the government*** [$_{TP}$ T [$_{vP}$ ***the fund*** [$_{vP}$ *the government* [$_{vP}$ ***v-approve*** [$_{VP}$ *approve the fund*]]]]]] [$_{S.AspP}$ S.Asp-***le*** [$_{TP}$ *the government* [$_{TP}$ T [$_{vP}$ *the fund* [$_{vP}$ *the government* [$_{vP}$ *v-approve* [$_{VP}$ *approve the fund*]]]]]]]]]]

Note that the Spec of NegQP is an Ā-position. I assume that each peripheral phase has only one such a position as an escape hatch.[16] Since the Spec of NegQP has already been occupied by *shenme* 'what', it can no longer serve as an escape hatch for the topic DP *the fund*.

Step 7: Merge the Top head with the NegQP. Since Top is a phase head, the domain of the lower phase NegQP (i.e., the S.AspP) is transferred. Crucially, the topic DP *the fund* located at the outer Spec of *v*P will also be transferred.

[16] Intermediate C heads also have only one Ā-position as an escape hatch. For instance, *wh*-island effects are derived because the Spec of the intermediate C occupied by one of the two *wh*-phrases can no longer serve as an escape hatch for the other *wh*-phrase. If C had more than one Ā-position, then both *wh*-phrases would be able to escape from the island, contrary to the fact.

(67) [$_{TopP}$ Top [$_{NegQP}$ ***Shenme*** [$_{NegQP}$ NegQ [$_{S.AspP}$ [$_{TP}$ ***the government*** [$_{TP}$ T [$_{vP}$ ***the fund*** [$_{vP}$ ~~*the government*~~ [$_{vP}$ ***v-approve*** [$_{VP}$ ~~*approve the fund*~~]]]]]] [$_{S.AspP}$ S.Asp-***le*** [~~$_{TP}$ *the government* [$_{TP}$ T [$_{vP}$ *the fund* [$_{vP}$ *the government* [$_{vP}$ *v-approve* [$_{VP}$ *approve the fund*]]]]]~~]]]]]

Since S.AspP containing *the fund* has been transferred, *the fund* cannot be moved out of the transferred portion. The derivation crashes.

4.4.4 TopP (Base-Generated) > NegQP > S.AspP > TP

A very interesting prediction is that the derivation should converge if the relevant topic phrase is not moved from the transferred portion but is base-generated at the Spec of TopP. This prediction is also borne out.

(68) [$_{TopP}$ *Zhe-jia yinhang*, [$_{NegP}$ **shenme** [$_{S.AspP}$ [$_{TP}$ fuwu taidu bian hao] **le**]]]!
this-CL bank what service attitude become good LE
'As for this bank, it is not true that the service becomes better!'

Since there is no Ā-movement involved in the derivation, nothing will be moved to the outer Spec of *v*P. Below is the step-by-step derivation.

Step 1: The TP Merges with the head S.Asp-*le* and then the TP raises to the Spec of S.AspP to satisfy the EPP of S.Asp. Since S.Asp is a phase head, the domain of the phase *v*P (i.e., VP) is transferred.

(69) [$_{S.AspP}$ [$_{TP}$ ***service becomes better***] [$_{S.AspP}$ S.Asp-***le*** [~~$_{TP}$ *service becomes better*~~]]]

Step 2: The NegQ head Merges with the S.AspP. Then, the negative *wh*-phrase *shenme* 'what' is Merged and satisfies the EPP of NegQ. The domain of the phase S.AspP (i.e., TP) is transferred.

(70) [$_{NegQP}$ ***shenme*** [$_{NegQP}$ NegQ [$_{S.AspP}$ [$_{TP}$ ***service becomes better***] [$_{S.AspP}$ S.Asp-***le*** [~~$_{TP}$ *service becomes better*~~]]]]]

Step 3: The Top head Merges with the NegQP. Then, the topic DP *this bank* is Merged to satisfy the EPP of Top.

(71) [$_{TopP}$ ***this bank*** [$_{TopP}$ Top [$_{NegQP}$ ***shenme*** [$_{NegQP}$ NegQ [$_{S.AspP}$ [$_{TP}$ ***service becomes better***] [$_{S.AspP}$ S.Asp-***le*** [~~$_{TP}$ *service becomes better*~~]]]]]]]

The derivation converges.

Another prediction is that a topic DP can be extracted in the case of multiple SFPs. This extraction is possible because the specifier of each SFP can serve as an escape hatch. This prediction is also borne out, as shown in (72).

(72) [$_{TopP}$ *Na-bi jingfei*$_j$, [$_{AttP}$ [$_{S.AspP}$ [$_{TP}$ zhengfu yao pi t$_j$] **le**] **ne**]]!
that-CL fund government will approve LE NE
'As for the fund, look, the government will approve (it)!'

We can continue the derivation based on (47) of Step 4.

Step 5: Merge Att-*ne* with the S.AspP. The complement of the lower phase head S.Asp-*le* (i.e., the lower copy of the TP) is transferred. Then, the S.AspP will raise to the Spec of AttP to satisfy the EPP of Att-*ne*.

(73) [AttP [S.AspP [TP ***the government*** [TP T-*will* [*v*P ***the fund*** [*v*P ~~*the government*~~ [*v*P ***v-approve*** [VP ~~*approve the fund*~~]]]]]] [S.AspP S.Asp-***le*** [TP ~~*the government* [TP T-*will* [*v*P *the fund* [*v*P *the government* [*v*P *v-approve* [VP *approve the fund*]]]]]]]][AttP Att-***ne*** [S.AspP [TP ~~*the government* [TP T-*will* [*v*P *the fund* [*v*P *the government* [*v*P *v-approve* [VP *approve the fund*~~]]]]]] [S.AspP S.Asp-*le* [TP ~~*the government* [TP T-*will* [*v*P *the fund* [*v*P *the government* [*v*P *v-approve* [VP *approve the fund*]]]]]]]]]]

Step 6: Merge the Top head with the AttP. The domain of the lower phase AttP (i.e., the lower copy of the S.AspP) gets transferred. Importantly, the entire S.AspP containing *the fund* is still at the Spec of AttP, which is an "escape hatch"; as a result, *the fund* has not been transferred. Agree is established between the Probe-Top and the Goal-*the fund* and then, *the fund* is moved to satisfy the EPP of the Top head.

(74) [TopP ***The fund*** [TopP **Top** [AttP [S.AspP [TP ***the government*** [TP T-*will* [*v*P ~~***the fund***~~ [*v*P ~~*the government*~~ [*v*P ***v-approve*** [VP ~~*approve the fund*~~]]]]]] [S.AspP S.Asp-***le*** [TP ~~*the government* [TP T-*will* [*v*P *the fund* [*v*P *the government* [*v*P *v-approve* [VP *approve the fund*]]]]]]]][AttP Att-***ne*** [S.AspP ~~[TP *the government* [TP T-*will* [*v*P *the fund* [*v*P *the government* [*v*P *v-approve* [VP *approve the fund*~~]]]]]] [S.AspP S.Asp-*le* [TP ~~*the government* [TP T-*will* [*v*P *the fund* [*v*P *the government* [*v*P *v-approve* [VP *approve the fund*]]]]]]]]]]]

Step 7: The final transfer.

In sum, the roll-up movement would postpone the transfer of phrases embedded in the rolled-up phrase, allowing them to move later. The cases discussed in this section convincingly show the following points:

(i) All the SFPs (lower or higher) in Chinese are phase heads.

(ii) All the peripheral projections have an EPP feature, which must be satisfied.

(iii) The comp-to-spec movement is obligatory when there is no alternative way to satisfy the EPP.

(iv) Transfer must happen after the comp-to-spec movement.

4.5 Cases Involving Topics Followed by Particles

The sentence in (75) has two analyses corresponding to two different hierarchical relations. In the first reading, the AttP is higher than the TopP, whereas in the second reading the TopP is higher than the AttP.

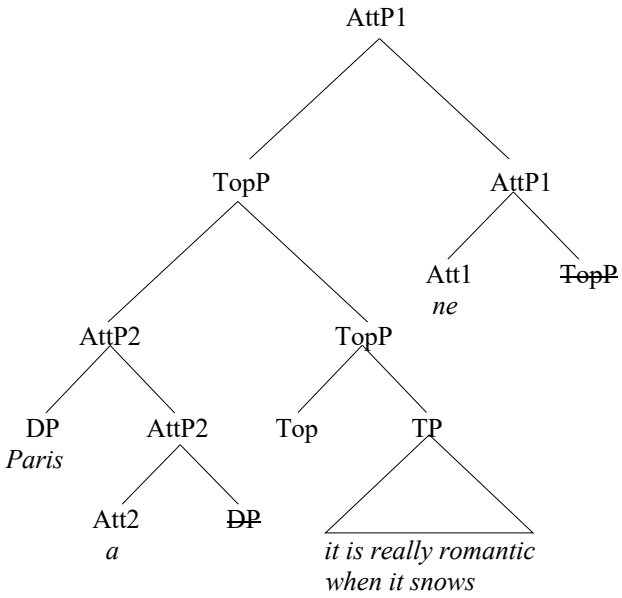
(75) a. [AttP [TopP Bali a, xia xue de shihou hai zhen langman] ne]!
Paris A fall snow DE moment still really romantic NE
'Look, as for Paris, it is really romantic when it snows!' (AttP > TopP)

b. [$_{TopP}$ Bali a, [$_{AttP}$ xia xue de shihou hai zhen langman ne]]!
Paris A fall snow DE moment still really romantic NE
'As for Paris, look, it is really romantic when it snows!' (TopP > AttP)

Paul (2015), Paul & Whitman (2017) propose that particles following a topic phrase in Chinese are treated as topic markers occupying the head position of a TopP. However, treating these particles as topic markers poses not only configurational problems but also interpretation problems, as extensively argued in Pan 2017, 2019a. Instead, I show that these particles are Attitude heads. SFPs can take a DP as their complement. Under such an analysis, what occupies the specifier position of the TopP, is the entire AttP-[*Bali a*].

(i) To derive the first reading in which Att-*ne* takes a wide scope.[17]

(76)



The AttP2 (*a*) is derived in an independent workspace parallel to the one in which {Top, TP} is Merged. The step-by-step derivation of (75a) is given below.

- Workspace 1: to build the AttP2 (*a*).

Step 1: Merge Att2-*a* with the DP-*Paris*. Since an AttP does not involve any Probe-Goal relation and there is no suitable Goal available for satisfying the EPP on the Att2 head, the entire complement, DP, internally Merges with the AttP2 to satisfy the EPP on Att2-*a*.

(77) [$_{AttP2}$ [$_{DP}$ ***Paris***] [$_{AttP2}$ Att2-***a*** ~~[$_{NP}$ *Paris*]~~]]

- Workspace 2: to build the AttP1 (*ne*).

Step 1: Merge the Top head with the TP. The domain of the lower phase *v*P (i.e., VP) is transferred.

[17] Although the wide scope reading of *ne* is technically possible, it is somehow a bit hard for some native speakers to obtain it.

(78) [$_{TopP}$ Top [$_{TP}$ *it is really romantic when it snows*]]

Step 2: Externally Merge the AttP2 (built in Workspace 1) with the TopP to satisfy the EPP feature of the Top head.

(79) [$_{TopP}$ [$_{AttP2}$ [$_{DP}$ ***Paris***] [$_{AttP2}$ Att2-***a*** ~~[$_{NP}$ *Paris*]~~]] [$_{TopP}$ Top [$_{TP}$ *it is really romantic when it snows*]]]

Step 3: Merge the phase head Att1-*ne* with the TopP. The domain of the TopP phase, the TP, is transferred to the interfaces.

(80) [$_{AttP1}$ Att1-***ne*** [$_{TopP}$ [$_{AttP2}$ [$_{DP}$ ***Paris***] [$_{AttP2}$ Att2-***a*** ~~[$_{NP}$ *Paris*]~~]] [$_{TopP}$ Top [$_{TP}$ *it is really romantic when it snows*]]]]

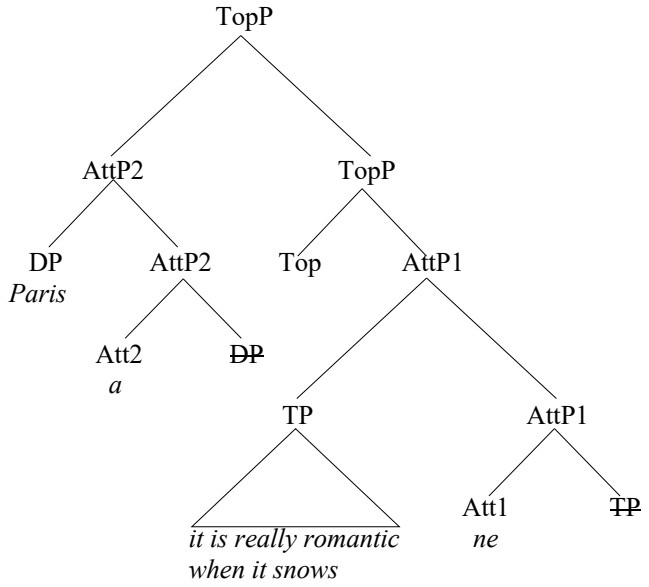
Step 4: Internally Merge the TopP with the AttP1 to satisfy the EPP of Att1-*ne*.

(81) [$_{AttP1}$ [$_{TopP}$ [$_{AttP2}$ [$_{DP}$ ***Paris***] [$_{AttP2}$ Att2-***a*** ~~[$_{NP}$ *Paris*]~~]] [$_{TopP}$ Top [$_{TP}$ *it is really romantic when it snows*]]]] [$_{AttP1}$ Att1-***ne*** ~~[$_{TopP}$ [$_{AttP2}$ [$_{DP}$ *Paris*] [$_{AttP2}$ Att2-*a* [$_{NP}$ *Paris*]]] [$_{TopP}$ Top [$_{TP}$ *it is really romantic when it snows*]]]]~~]]

Step 5: The final transfer of the entire sentence.

(ii) To derive the second reading in which the TopP takes a wide scope.

(82)



- Workspace 1: to build the AttP2 (*a*).

(83) [$_{AttP2}$ [$_{DP}$ ***Paris***] [$_{AttP2}$ Att2-***a*** ~~[$_{NP}$ *Paris*]~~]]

- Workspace 2: to build the TopP.

Step 1: Merge the phasal head Att1-*ne* with the TP. The domain of the lower phase *v*P (i.e., VP) is transferred.

(84) [$_{AttP1}$ Att1-*ne* [$_{TP}$ *it is really romantic when it snows*]]

Step 2: Internally Merge the TP with the AttP1 to satisfy the EPP feature of Att-*ne*.

(85) [$_{AttP1}$ [$_{TP}$ ***it is really romantic when it snows***] [$_{AttP1}$ Att1-***ne*** ~~[$_{TP}$ *it is really romantic when it snows*]~~]]

Step 3: Merge the Top head with the AttP1 and the domain of the AttP1 phase, the lower copy of the TP, is transferred.

(86) [$_{TopP}$ Top [$_{AttP1}$ [$_{TP}$ ***it is really romantic when it snows***] [$_{AttP1}$ Att1-***ne*** ~~[$_{TP}$ *it is really romantic when it snows*]~~]]]

Step 4: The AttP2 (built in Workspace 1) is externally Merged with the TopP to satisfy the EPP feature of the Top head.

(87) [$_{TopP}$ [$_{AttP2}$ [$_{DP}$ ***Paris***] [$_{AttP2}$ Att2-***a*** ~~[$_{NP}$ *Paris*]~~]] [$_{TopP}$ Top [$_{AttP1}$ [$_{TP}$ ***it is really romantic when it snows***] [$_{AttP1}$ Att1-***ne*** ~~[$_{TP}$ *it is really romantic when it snows*]~~]]]]

Step 5: The final transfer of the entire sentence.

A similar derivation applies to resumptive left-dislocation cases. The reader can refer to Pan 2016 for detailed discussion on such constructions in Chinese.

4.6 Summary

Let us assume that a phase head Z Merges with its complement WP and that YP is a constituent inside WP, as shown in (88).

(88) Z [$_{WP}$ ….YP…]

Table 3 summarizes different ways to satisfy the EPP on Z.

Table 3 Different ways to satisfy the EPP on Z

<table>
<tr><th>Probe-Goal relation?</th><th colspan="2">Mechanisms</th><th colspan="2">The relevant structures</th></tr>
<tr><td rowspan="3">If there is a Probe-Goal relation between Z and YP</td><td rowspan="3">YP is an explicit Goal</td><td>An available XP can be Merged at the Spec of Z.</td><td colspan="2">Resumptive left-dislocation structures</td></tr>
<tr><td>A null operator can be Merged at the Spec of Z</td><td colspan="2">Null wh-question operator Op in wh-in-situ questions</td></tr>
<tr><td>The Goal-YP moves to the Spec of Z</td><td colspan="2">Topic structures derived by movement</td></tr>
<tr><td rowspan="6">No Probe-Goal relation for Z.</td><td colspan="2" rowspan="2">An available XP can be Merged at the Spec of Z.</td><td colspan="2">Dangling topic structures</td></tr>
<tr><td colspan="2">The negative wh-phrase shenme ‘what’ is generated at the Spec of NegQP in negative wh-questions</td></tr>
<tr><td colspan="2" rowspan="4">Neither an overt XP nor a null operator is available. The entire complement raises to the Spec of Z</td><td>S.AspP</td><td>le, laizhe, ne</td></tr>
<tr><td>OnlyP</td><td>eryi</td></tr>
<tr><td>iForceP for yes-no questions and imperatives</td><td>ma, ba1, ba2</td></tr>
<tr><td>AttP</td><td>ne, a, ba3, ya, and so on.</td></tr>
</table>

Table 3 shows that peripheral functional heads can be roughly divided into two categories: (i) those dependent on a Probe-Goal relation and (ii) those not. In the first category, under the Probe-Goal relation, a given phase head Z acts as a Probe, which bears unvalued features. It could be the case that a Minimal Search finds a suitable Goal, say YP, inside the complement of Z, and as a result, an Agree relation can be established between the Probe-Z and the Goal-YP. If the Probe-Z bears an EPP feature, it must be satisfied. Whether the matched Goal-YP needs to internally Merge with the ZP to satisfy the EPP feature on the Probe Z depends on the availability of a certain phrase constructed in a separate workspace, which can itself be externally Merged with the ZP to satisfy the EPP on Z. The Goal-YP does not need to move (i) if an XP constructed in a separate workspace can be Merged with the ZP, such as in resumptive left-dislocation structures, or (ii) if a null operator can be Merged with the ZP, such as the null *wh*-question operator Op in the sense of Tsai 1994. By contrast, when neither of these two options is available, the Goal-YP internally Merges with the ZP to satisfy the EPP on the Probe Z, such as in topicalization cases derived by movement. All of these three strategies can satisfy the EPP.

In the second category, the relevant phase head Z does not function as an active Probe, and therefore, it does not enter any Probe-Goal relation. An XP can be Merged with the ZP to satisfy the EPP on Z, such as a hanging topic, and, the negative *wh*-word *shenme* 'what' in negative *wh*-questions. In the extreme case, when there is absolutely no element, which can either be externally or internally Merged with the ZP to satisfy the EPP on Z, the entire complement of Z, say WP, will raise to the Spec of Z as a last resort to satisfy the EPP. This is precisely the case of SFPs in Chinese. To conclude, the surface "complement preceding head" order of SFPs in Chinese results from comp-to-spec movement, as a last resort, to satisfy the EPP.

5. Remaining Issues

5.1 Violation of FOFC

The Final-Over-Final Constraint (FOFC) (see Biberauer, Holmberg & Roberts 2014; Sheehan et al. 2017) states that a head-final phrase αP cannot immediately dominate a head-initial phrase βP, if α and β are members of the same extended projection, as shown in (89).

(89) *[$_{\alpha P}$ [$_{\beta P}$ β γ] α], where β and γ are sisters and α and β are members of the same extended projection.

The head-final analysis of Chinese SFPs constitutes anti-FOFC evidence, as in (90), where the head-final CP hosting the SFP dominates a head-initial TP as its complement.

(90) a. [$_{CP}$ [$_{TP}$ EA [$_{TP}$ T [$_{vP}$ ~~EA~~ [$_{vP}$ *v* [$_{VP}$ V IA]]]]] [$_{C}$ SFP]]

b. [$_{CP}$ [$_{TP}$ Nimen yiqi qu Beijing] [$_{C}$ ma]]]?
you together go Beijing Q*yes-no*
'Do you go to Beijing together?'

Bailey (2012) shows that some of the apparently FOFC-violating final question particles in languages like Vietnamese may actually be initial negative disjunctions of an elided disjunct clause. Tang (2015) proposes a similar analysis to account for SFPs in Chinese. C is analyzed as a disjunctive head, which takes two identical TPs, except that one is positive and the other negative, as arguments. The lower TP is deleted at PF, which gives rise to [$_{DisjP}$ TP [$_{DisjP}$ C-*OR* [~~TP~~]]]. If SFPs occupying C are analyzed as conjunction or disjunction heads, they do not c-select specific complements and they do not label; as a result, they are considered as acategorial

elements. Therefore, FOFC does not apply to them (also see Biberauer, Holmberg & Roberts 2014). Although the disjunction analysis of SFPs seems to solve the conflict with regard to FOFC, it suffers from several derivational problems as discussed in detail in Pan & Paul 2016. In addition, the disjunctive operator analysis applies to the *yes-no* question particle *ma* due to the semantic reason; however, it is conceivable that all of the SFPs would be disjunctive operators, such as the imperative particle *ba* and the attitude particles *ya*, *la*, *ne*. Recall that FOFC as formulated in Biberauer, Holmberg & Roberts 2014 holds only within "extended projections." This seems to provide us with a way to account for SFPs in Chinese. There is no doubt *v*P and TP (and also ModalityP) can count as extended projections of V. However, whether CP is an extended projection of V is a controversial issue. C can have [V] since T hosting auxiliaries in English or verbs in Romance languages can be moved to C to derive subject-aux/verb inversion. In V2 languages, V also raises to C. C seems to also have [N] since CP can be complement of V, specifier of T (sentential subject), complement of N. However, a crucial fact is that C in languages like English cannot take a nominal as its complement, which is drastically different from SFPs in Chinese. SFPs do not necessarily select TP; they can take DP or AdjP as their complement. For instance,

(91) a. (Kan!) Bingshan ne / a / ei !
look iceberg NE / A / EI
'(Look!) An iceberg!'

b. Zhen man a !
really slow A
'Too slow!'

In (91a), SFPs such as *ne*, *a*, and *ei* directly take a bare noun *bingshan* 'iceberg' as their complement. In (91b), *a* takes an AdjP [*really slow*] as its complement. In addition, I have presented cases in which several peripheral projections co-occur with a fixed hierarchical order. Importantly, a higher projection can take any lower projection as its complement without selecting a specific type of projection categorially. For instance, the highest Attitude SFPs can take an SQP or an iForceP or an *Only*P or an S.AspP as their complement (as shown in sections 3 and 4). These facts suggest that it is highly probable that a peripheral projection hosting an SFP is not necessarily an extended projection of V in Chinese. Along this line, SFPs not only each define a phase, but also define their own extended projections.[18] If so, then FOFC does not apply to SFPs.

5.2 Violation of Antilocality

Following Abels (2003), comp-to-spec movement is generally excluded since the movement is "too local." Under the assumption that movement must be triggered by a certain feature, the movement from complement to specifier is banned since no feature triggering is involved. Second, under the assumption that movement is allowed only if it has an effect on output, the comp-to-spec movement does not seem to contribute to the interpretation at C-I interface. For the moment, there is no solution to the incompatibility between any analysis based on comp-to-spec movement and the antilocality. However, note that the examples (61, 64, 68) presented in section 4.4 are particularly convincing since without comp-to-spec movement, these

[18] Sheehan et al. (2017:ch. 9 written by Biberauer) also propose that Sentence-Final Particles in Chinese exhibit strict "cluster-internal" ordering effects and that they derive from different phases. In this sense, Chinese can have four SFP clusters, V, *v*P, CP, and SAP (Speech Acts), which constitute four different phasal domains.

sentences cannot be derived.[19]

6. Conclusion

The Chinese periphery is composed of not only SFPs but also other types of projections, whose heads are not overt particles. I assume that all of the peripheral heads in Chinese are phase heads bearing an EPP feature. Different types of peripheral projections dispose of different strategies to fulfill the requirement of the EPP. The choice of the strategy depends on whether a given phase head Z implies a Probe-Goal relation and on whether there is an available XP or a null operator that can be Merged with the ZP to satisfy the EPP on Z. Importantly, the complement of an SFP undergoes comp-to-spec raising. This type of movement can only be activated as a last resort strategy to satisfy the EPP feature attached to a phasal head. The movement of the complement to the phase edge would postpone the transfer of phrases embedded in the complement, allowing these phrases to be moved later. When the phase edge is not available for the moved complement, phrases embedded within the complement will not be available for extraction in the later stage after the complement is transferred. This constitutes a strong argument in favor of the obligatory comp-to-spec raising analysis for SFPs in Chinese.

References

Abels, Klaus. 2003. Successive Cyclicity, Anti-locality, and Adposition Stranding. Doctoral dissertation, University of Connecticut, Storrs.

Badan, Linda. 2007. High and low periphery: A comparison between Italian and Chinese. Doctoral dissertation, Universita' Degli Studi di Padova.

Bailey, Laura. 2012. The syntax of question particles. Doctoral dissertation, Newcastle University.

Biberauer, Theresa, Anders Holmberg and Ian Roberts. 2014. A syntactic universal and its consequences. *Linguistic Inquiry* 45:169-225.

Biberauer, Theresa, Liliane Haegeman and Ans van Kemenade. 2014. Putting our heads together: Towards a syntax of particles. *Studia Linguistica* 68:1-15.

Boeckx, Cedric. 2008. *Bare Syntax*. Oxford: Oxford University Press.

Cardinaletti, Anna. 2015. Italian verb-based discourse particles in a comparative perspective. In *Discourse-oriented Syntax*, ed. by Josef Bayer, Roland Hinterhölzl and Andreas Trotzke, 71-91. Amsterdam: John Benjamins Publishing Company.

Cheung, Lawrence Yam Leung. 2008. The Negative Wh-Construction. Doctoral dissertation, UCLA.

Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.

Chomsky, Noam. 2000. Minimalist inquiries: The framework. In *Step by step: Essays on Minimalist syntax in honor of Howard Lasnik*, ed. by Roger Martin, David Michaels, and Juan Uriagereka, 89-156. Cambridge, MA: MIT Press.

Chomsky, Noam. 2001. Derivation by phase. In *Ken Hale: A life in language*, ed. by Michael Kenstowicz, 1-52. Cambridge, MA: MIT Press.

Chomsky, Noam. 2004. Beyond Explanatory Adequacy. In *Structures and Beyond*, ed. by Belletti Adriana, 104-131. Oxford: Oxford University Press.

Chomsky, Noam. 2008. On phases. In *Foundational issues in linguistic theory: Essays in honor of Jean-Roger Vergnaud*, ed. by Robert Freidin, Carlos Otero and Maria Luisa Zubizarreta, 133-165. Cambridge, MA: MIT Press.

Chomsky, Noam. 2012. Foreword. In *Phases*, ed. by Ángel Gallego, 1-7. Berlin: De Gruyter Mouton.

[19] Ledgeway (2012, 2018) argues that the head-finality is regarded as the output of a roll-up operation that raises the complement to the specifier to the left of its selecting head and that antilocality is not a universal condition on all instances of local movement but should be parameterized across languages.

Chomsky, Noam. 2019. Some Puzzling Foundational Issues: The Reading Program. *Catalan Journal of Linguistics* Special Issue:263-285.
Chomsky, Noam. 2020. Puzzles About Phases. In *Linguistic Variation: Structure and Interpretation*, ed. by Ludovico Franco and Paolo Lorusso, 163-168. Berlin: De Gruyter Mouton.
Chomsky, Noam, Ángel Gallego and Dennis Ott. 2019. Generative Grammar and the Faculty of Language: Insights, Questions, and Challenges. *Catalan Journal of Linguistics* Special Issue:229-216.
Cinque, Guglielmo. 1999. *Adverbs and Functional Heads*. Oxford: Oxford University Press.
Cinque, Guglielmo and Luigi Rizzi. 2008. The Cartography of Syntactic Structures. In *STiL-Studies in Linguistics Vol. 2*, ed. by Vincenzo Moscati, 42-58. CISCL Working Papers on Language and Cognition. Siena: CISCL Press.
Citko, Barbara. 2014. *Phase theory: An introduction*. New York, NY: Cambridge University Press.
Dai, Qingxia. 2010. *Zangmian Yuzu Yuyan Yanjiu* [Research on Tibeto-Burman languages], volume 5. Kunming: Yunnan Minzu Chubanshe.
Deng, Dun. 2015. The Syntacticization of Illocutionary Forces and the Root vs. Non-root Distinction: Evidence from the Sentence-final Particle *ba* in Mandarin. *Lingua* 162:32-55.
Erlewine, Michael Yoshitaka. 2017. Low sentence-final particles in Mandarin Chinese and the Final-over-Final Constraint. *Journal of East Asian Linguistics* 26:37-75.
Haegeman, Liliane. 2014. West Flemish verb-based discourse markers and the articulation of the speech act layer. *Studia Linguistica* 86:116-139.
Haegeman, Liliane and Virginia Hill. 2013. The Syntacticization of Discourse. In *Syntax and Its Limits*, ed. by Raffaella Folli, Robert Truswell, and Christina Sevdali, 370-390. Oxford: Oxford University Press.
Hill, Virginia. 2007. Vocatives and the pragmatics-syntax interface. *Lingua* 117:2077-2105.
Hsieh, Feng-fan and Rint Sybesma. 2011. On the linearization of Chinese sentence-final particles: Max spell out and why CP moves. *Korea Journal of Chinese Language and Literature* 1 (48.3):53-90.
Julien, Marit. 2002. *Syntactic Heads and Word Formation*. Oxford: Oxford University Press.
Kayne, Richard. 1994. *The antisymmetry of syntax*. Cambridge, MA: MIT Press.
Ledgeway, Adam. 2012. *From Latin to Romance: Morphosyntactic Typology and Change*. Oxford: Oxford University Press.
Ledgeway, Adam. 2018. On the Decline of Edge-fronting from Latin to Romance, in *Word Order Change*, ed. by Ana Maria Martins and Adriana Cardoso, 264-278. Oxford: Oxford University Press.
Lee, Hun-tak Thomas 1986. Studies on quantification in Chinese. Doctoral dissertation, UCLA.
Li, Boya. 2006. Chinese Final Particles and the Syntax of the Periphery. Doctoral dissertation, Leiden University.
Li, Charles and Sandra Thompson. 1976. Subject and topic: A new typology of language. In *Subject and topic*, ed. by C. N. Li, 457-489. New York: Academic Press.
Miyagawa, Shigeru. 2017. *Agreement beyond phi*. Cambridge, MA: MIT Press.
Munaro, Nicola and Cecilia Poletto. 2002. Ways of clausal typing. *Rivista di Grammatica Generativa* 27:87-105.
Ouali, Hamid. 2008. On C-To-T Phi-Feature Transfer: The Nature of Agreement and Anti-Agreement in Berber. In *Agreement Restrictions*, ed. by Roberta D'Alessandro, Susan Fischer and Gunnar Hrafn Hrafnbjargarson, 159-180. Berlin: De Gruyter Mouton.
Pan, Haihua and Jianhua Hu. 2008. A semantic-pragmatic interface account of (dangling) topics in Mandarin Chinese. *Journal of Pragmatics* 40:1966-1981.

Pan, Victor Junnan. 2014. Wh-ex-situ in Chinese: Mapping Between Information Structure and Split CP. *Linguistic Analysis* 39:371-413.
Pan, Victor Junnan. 2015. Mandarin Peripheral Construals at Syntax-Discourse Interface. *The Linguistic Review* 32:819-868.
Pan, Victor Junnan. 2016. *Resumptivity in Mandarin Chinese: A Minimalist Account*. Berlin: De Gruyter Mouton.
Pan, Victor Junnan. 2017. Optional projections in the left-periphery in Mandarin Chinese. In *Studies on Syntactic Cartography*, ed. by Fuzhen Si, 216-248. Beijing: China Social Sciences Press.
Pan, Victor Junnan. 2019a. *Architecture of The Periphery in Chinese: Cartography and Minimalism*. [Routledge Studies on Chinese Linguistics], London & New York: Routledge.
Pan, Victor Junnan. 2019b. Derivation of The Apparent Narrow Scope of Sentence-Final Particles in Chinese: A Reply to Erlewine (2017). *Studies in Chinese Linguistics* 39:99-126.
Pan, Victor Junnan and Waltraud Paul. 2016. Why Chinese SFPs are neither optional nor disjunctors. *Lingua* 170:23-34.
Paul, Waltraud. 2014. Why particles are not particular: Sentence-final particles in Chinese as heads of a split CP. *Studia Linguistica* 68:77-115.
Paul, Waltraud. 2015. *New Perspectives on Chinese Syntax*. Berlin: De Gruyter Mouton.
Paul, Waltraud and Victor Junnan Pan. 2017. What you see is what you get: Chinese sentence-final particles as head-final complementizers. In *Discourse Particles – Formal Approaches to their Syntax and Semantics*, ed. by Josef Bayer and Volker Struckmeier, 49-77. Berlin: De Gruyter Mouton.
Paul, Waltraud and John Whitman. 2017. Topic Prominence. In *The Blackwell Companion to Syntax*, 2nd edition, ed. by Martin Everaert and Henk van Riemsdijk, 4473-4503. MA: Malden.
Rizzi, Luigi. 1997. The Fine Structure of the Left Periphery. In *Elements of Grammar*, ed. by Liliane Haegeman, 281-337. Dordrecht: Kluwer.
Sheehan, Michelle, Theresa Biberauer, Ian Roberts and Anders Holmberg. 2017. *The Final-Over-Final Condition: A Syntactic Universal*. Cambridge, MA: MIT Press.
Simpson, Andrew and Zoe Wu. 2002. IP-raising, Tone Sandhi and Creation of S-final particles: Evidence for Cyclic Spell-Out. *Journal of East Asian Linguistics* 11:67-99.
Su, Lily I-Wen. 2004. Subjectification and the Use of the Complementizer SHUO. *Concentric*: *Studies in Linguistics* 30(1):19-40.
Sybesma, Rint. 1999. *The Mandarin VP*. Dordrecht: Kluwer Academic Publishers.
Takita, Kensuke. 2009. If Chinese is head-initial, Japanese cannot be. *Journal of East Asian Linguistics* 18:41-61.
Tang, Sze-Wing. 1998. Parametrization of Features in Syntax. Doctoral dissertation, University of California, Irvine.
Tang, Sze-Wing. 2015. A generalized syntactic schema for utterance particles in Chinese. *Lingua Sinica* 1(3):1-23.
Tsai, Wei-Tien Dylan. 1994. On Economizing the Theory of A-bar Dependencies. Doctoral dissertation, MIT.
Tsai, Wei-Tien Dylan. 2008. Left Periphery and *How-Why* Alternations. *Journal of East Asian Linguistics* 17:83-115.
Zhang, Niina Ning. 2019. Sentence-Final Aspect Particles as Finite Markers in Mandarin Chinese. *Linguistics* 57:967-1023.