Generalized Composite Probing in Mandarin

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1. Introduction

It is commonly assumed that phrasal movement in natural languages can be strictly classified as either *A-movement* or *Ā-movement*, which are associated with distinct properties: A-movement but not Ā-movement creates new antecedents for anaphor binding and is not subject to weak crossover or Principle C reconstruction; by contrast, Ā-movement but not A-movement is long-distance, crossing c-commanding NPs and finite CPs (see e.g., Postal 1971; Chomsky 1977, 1981; a.o. and Richards 2014 for a comprehensive overview of these properties). From a *featural view of the A/Ā-distinction*, distinct properties associated with A-movement and Ā-movement are derived from distinct [A]-feature (e.g., [ϕ], [CASE], [D]) and [Ā]-feature (e.g., [WH], [REL], [TOP], [FOC]) which trigger A-movement and Ā-movement, respectively (Van Urk 2015; Longenbaugh 2017; Lohninger, Kovač & Wurmbrand 2022; Lohninger & Yip 2023; Chen 2023; a.o.). Furthermore, the possibility of *composite probing* allows [A]-feature and [Ā]-feature present on the same head to probe together (via *conjunctive satisfaction*, see Scott 2021), attracting the closest NP with both a matching [A]-feature and a matching [Ā]-feature (Van Urk 2015; Longenbaugh 2017; Lohninger, Kovač & Wurmbrand 2022; Chen 2023; a.o.). The featural view of the A/Ā-distinction and the possibility of composite probing together predict the existence of *composite A/Ā-movement*, triggered by the composite probe [A+Ā], and that such movement should be associated with mixed A/Ā-properties. Positive evidence has been found in Dinka movement to Spec, CP (e.g., topicalization and relativization) (Van Urk 2015), English *tough*-movement (Longenbaugh 2017), and Mandarin passivization (Chen 2023), as summarized in (1). Notably, composite A/Ā-movement is *clause-bound* in English and Mandarin but not in Dinka. This follows from cross-linguistic variations on the distribution of composite probes and a general ban on improper composite A/Ā-movement after Ā-movement. Specifically, it has been proposed that in English and Mandarin, the C head hosts pure Ā-probes but not the composite probe [A+Ā]; consequently, long-distance movement across a finite CP phase (via Spec, CP) is necessarily Ā-movement, which cannot be followed by further composite A/Ā-movement (see e.g., Longenbaugh 2017; Chen 2023).[1]

This paper aims to expand cross-linguistic evidence for composite probing, with a specific focus on Mandarin. I argue that composite probing by the composite probe [A+Ā] is generally observed in Mandarin, in the sense that multiple heads projected in the low IP area host the composite probe [A+Ā], and that the Voice head, as a phase head, generally hosts the composite probe [A+Ā] for purposes of successive-cyclic movement. The evidence will come from two types of topicalization and focalization in Mandarin, which exhibit mixed A/Ā-properties, as summarized also in (1). Specifically, I will argue that *IP-internal topicalization and focalization* involve successive-cyclic composite A/Ā-movement via Spec, VoiceP, which terminate at IP-internal Spec, TopP and Spec, FocP, respectively, as illustrated in (2), while *IP-external topicalization and focalization* can involve intermediate steps of composite A/Ā-movement to Spec, VoiceP, followed by a terminating step of Ā-movement to IP-external Spec, TopP and Spec, FocP, respectively, as illustrated in (3).

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[1] The ban on improper composite A/Ā-movement after Ā-movement stems from the ban on improper A-movement after Ā-movement, which in turn stems from the inherent differences between [A]-features and [Ā]-features (see e.g., Neeleman & van De Koot 2010; Obata & Epstein 2011). For more detailed discussion, see Chen (2023).

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(1) *Mixed A/Ā-properties of composite A/Ā-movement vs. Mandarin topicalization and focalization*

Properties	A	Ā	Dinka, English, Mandarin composite A/Ā-movement	Mandarin IP-internal topicalization focalization	Mandarin IP-external topicalization focalization
New antecedents for anaphor binding	✓	*	✓	✓	*
No weak crossover	✓	*	✓	✓	* / ✓
No reconstruction for Principle C	✓	*	✓	✓	* / ✓
Long-distance ... ... crossing c-commanding NPs	*	✓	✓	✓	✓
Long-distance ... ... crossing finite CPs	*	✓	✓(D) * (E, M)	*	✓

(2) a. *Mandarin: IP-internal topicalization as successive-cyclic composite movement*

$[_{IP}\ Subj_{i[\phi]}\ Infl_{[\phi]}\ [_{TopP}\ \mathbf{Obj_{j[\phi],[TOP]}}\ Top_{[\phi+TOP]}\ \ldots\ [_{VoiceP}\ t_i\ \mathbf{t_j}\ Voice_{[\phi+TOP]}\ \ldots\ \mathbf{t_j}\ (\ldots)\ ]]]$

A/Ā-movement A/Ā-movement

b. *Mandarin: IP-internal focalization as successive-cyclic composite movement*

$[_{IP}\ Subj_{i[\phi]}\ Infl_{[\phi]}\ [_{FocP}\ \mathbf{Obj_{j[\phi],[FOC]}}\ Foc_{[\phi+FOC]}\ \ldots\ [_{VoiceP}\ t_i\ \mathbf{t_j}\ Voice_{[\phi+FOC]}\ \ldots\ \mathbf{t_j}\ (\ldots)\ ]]]$

A/Ā-movement A/Ā-movement

(3) a. *Mandarin: IP-external topicalization via intermediate composite movement*

$[_{TopP}\ \mathbf{Obj_{i[\phi],[TOP]}}\ Top_{[TOP]}\ [_{IP}\ Subj_{j[\phi]}\ Infl_{[\phi]}\ \ldots\ [_{VoiceP}\ \mathbf{t_i}\ t_j\ Voice_{[\phi+TOP]}\ \ldots\ \mathbf{t_i}\ (\ldots)\ ]]]$

Ā-movement A/Ā-movement

b. *Mandarin: IP-external focalization via intermediate composite movement*

$[_{FocP}\ \mathbf{Obj_{i[\phi],[FOC]}}\ Foc_{[FOC]}\ [_{IP}\ Subj_{j[\phi]}\ Infl_{[\phi]}\ \ldots\ [_{VoiceP}\ \mathbf{t_i}\ t_j\ Voice_{[\phi+FOC]}\ \ldots\ \mathbf{t_i}\ (\ldots)\ ]]]$

Ā-movement A/Ā-movement

The remainder of the paper is organized as follows: In section 2, I will present the evidence that IP-internal and IP-external topicalization and focalization in Mandarin involve movement into the low IP area and left periphery respectively. In section 3, I will argue that the mixed A/Ā-properties of IP-internal topicalization and focalization are derived from the derivation in (2). In section 4, I will argue that the mixed A/Ā-properties of IP-external topicalization and focalization are derived from the derivation in (3). In section 5, I will account for an additional contrast between IP-internal and IP-external topicalization and focalization with respect to Principle A reconstruction. Section 6 will conclude with a distribution of A-, Ā-, and composite probes in Mandarin low IP area and left periphery.

2. Movement into the low IP area and left periphery

In Mandarin, topicalization and focalization can target either an IP-internal or IP-external position, either below or above the grammatical subject in Spec, IP (see e.g., Qu 1994; Shyu 1995; Ting 1995; Paul 2002, 2005; Kuo 2009). In (4-a) and (4-b), the IP-internal or IP-external topic or focus NP is linked to a gap in the post-verbal object position.[2]

[2] In the focalization constructions, *lian* 'even' is a focus marker and *dou* is a predicate quantifier, according to Shyu (1995). The syntax and semantics of *dou* have been a topic of much discussion but they are not the focus of this paper; for an overview of the distribution and interpretations of *dou*, see e.g., Lin (1998); Xiang (2008); a.o.

(4) a. *IP-internal topicalization/focalization*
[$_{IP}$ Lisi [(lian) **zhe-jian shi**]$_i$ (dou) diaocha-le ___$_i$].
Lisi even this-CL matter DIST investigate-PRF
'Lisi, (even) this matter, investigated (it).'

b. *IP-external topicalization/focalization*
[(Lian) **zhe-jian shi**]$_i$ [$_{IP}$ Lisi (dou) diaocha-le ___$_i$].
even this-CL matter Lisi DIST investigate-PRF
'(Even) this matter, Lisi investigated (it).'

In (5), the IP-internal or IP-external topic or focus NP is linked to an object gap inside a complex NP island; the ill-formedness of (5) suggests that the dependency between the topic or focus NP and the gap is established via movement.

(5) a. *IP-internal topicalization and focalization: Island-sensitive*
*Jingcha [(lian) **Lisi**]$_i$ (dou) zhuazou-le [$_{NP}$ na-ge ___$_j$ da-le ___$_i$ de ren$_j$].
police even Lisi DIST arrest-PRF that-CL hit-PRF REL person
INT: 'The police, (even) Lisi, arrested that person who hit (him).'

b. *IP-external topicalization and focalization: Island-sensitive*
*[(Lian) **Lisi**]$_i$, jingcha (dou) zhuazou-le [$_{NP}$ na-ge ___$_j$ da-le ___$_i$ de ren$_j$].
even Lisi police DIST arrest-PRF that-CL hit-PRF REL person
INT: '(Even) Lisi, the police arrested that person who hit (him).'

Furthermore, in IP-internal topicalization and focalization, the IP-internal topic or focus NP may precede or follow Tense-Aspect-Modality categories and sentential negation, but crucially, an IP-internal topic NP must precede and not follow the progressive aspect *(zheng)zai* or the aspectual/perfective negation *(hai) mei*, while an (IP-internal) focus NP always precedes *dou*, which is outside VoiceP; I take this to indicate that IP-internal topicalization and focalization has variable landing sites within the low IP area, but crucially must be structurally above the VoiceP (cf. Qu 1994; Shyu 1995; Ting 1995; Paul 2002, 2005; Kuo 2009).[3]

(6) *IP-internal topic or focus NP precedes Tense-Aspect-Modality and sentential negation*

a. Lisi [(lian) **zhe-jian shi**]$_i$ zuotian (dou) [$_{VoiceP}$ (haohao) diaocha-le ___$_i$].
Lisi even this-CL matter yesterday DIST well investigate-PRF
'Lisi, (even) this matter, yesterday investigated (it) (well).'

b. Lisi [(lian) **zhe-jian shi**]$_i$ (dou) keneng/keyi [$_{VoiceP}$ (haohao) diaocha ___$_i$].
Lisi even this-CL matter DIST be.possible/be.able well investigate
'Lisi, (even) this matter, is possible/is able to investigate (it) (well).'

c. Lisi [(lian) **zhe-jian shi**]$_i$ (dou) (zheng)zai/(hai) mei-you [$_{VoiceP}$ (haohao) diaocha ___$_i$].
Lisi even this-CL matter DIST PROG/yet NEG-have well investigate
'Lisi, (even) this matter, is investigating/has not investigated (it) (well).'

d. *Lisi (zheng)zai/(hai) mei-you [**zhe-jian shi**]$_i$ [$_{VoiceP}$ (haohao) diaocha ___$_i$].
Lisi PROG/yet NEG-have this-CL matter well investigate
INT: 'Lisi, this matter, is investigating/has not investigated (it) (well).'

Hence, I adopt Paul's (2005) proposal that in Mandarin, projections in the low IP area parallel those in the left periphery: IP-internal topicalization and focalization target IP-internal Spec, TopP and Spec, FocP

[3] (IP-internal) topicalization and focalization in Mandarin are subject to the so-called facilitator effects, which requires the movement to cross either a high facilitator outside the VoiceP (e.g., a Tense-Aspect-Modality category) or a low facilitator inside the VoiceP (e.g., a manner adverb) within its path. For more details, see Chen & Yip (2025).

in the low IP area, below the grammatical subject in Spec, IP; IP-external topicalization and focalization target IP-external Spec, TopP and Spec, FocP in the left periphery, above the grammatical subject in Spec, IP.

3. IP-internal topic and focus movement as successive-cyclic composite movement

It has long been noted that IP-internal topicalization and focalization can establish a long-distance dependency between the IP-internal topic or focus NP and a deeply embedded object gap across non-finite clause boundaries but not across a finite clause boundary (Qu 1994; Ting 1995; Shyu 1995; Kuo 2009):[4]

(7) *IP-internal topicalization and focalization: Restricted long-distance dependency*

a. *Long-distance dependency across non-finite boundaries*

Meiyou-ren, [(lian) **zhe-jian shi**]$_i$, (dou) [$_{VoiceP}$ bi Zhang [$_{VoiceP}$ jiao Wang [$_{VoiceP}$ diaocha ___$_i$]]].
no-person even this-CL matter DIST force Zhang ask Wang investigate
'Nobody, (even) this matter$_i$, forced Zhang to ask Wang to investigate (it$_i$).'

b. *No long-distance dependency across finite boundary*

*Meiyou-ren, [(lian) **zhe-jian shi**]$_i$, (dou) xiangxin/zhidao [$_{CP}$ Zhang hui diaocha ___$_i$].
no-person even this-CL matter DIST believe/know Zhang will investigate
INT: 'Nobody, (even) this matter$_i$, believes/knows that Zhang will investigate (it$_i$).'

In addition, (long-distance) IP-internal topicalization and focalization exhibit properties of A-movement, creating new antecedents for anaphor binding and not subject to weak crossover or Principle C reconstruction (Qu 1994; Ting 1995; Shyu 1995; Kuo 2009).

(8) a. *IP-internal topicalization and focalization: New antecedents for anaphor binding*

Zhang, [(lian) **zhe-ge ren**]$_i$, (dou) [$_{VoiceP}$ bi ta-ziji$_i$-de pengyou [$_{VoiceP}$ ma-guo ___$_i$]].
Zhang even that-CL person DIST force 3SG-self's friend scold-EXP
'Zhang, (even) this person$_i$, once forced his$_i$ friend to scold (him$_i$).'

b. *IP-internal topicalization (of quantifier phrase): No weak crossover*

Zhang, [**mei-ge ren**]$_i$, dou [$_{VoiceP}$ bi ta$_i$-de pengyou [$_{VoiceP}$ ma-guo ___$_i$]]?
Zhang every-CL person DIST force 3SG's friend scold-EXP
Lit. 'Zhang, every person$_i$, once forced his$_i$ friend to scold (him$_i$)?'

c. *IP-internal focalization: No weak crossover*

Zhang, [lian **Li**]$_i$, dou [$_{VoiceP}$ bi ta$_i$-de pengyou [$_{VoiceP}$ ma-guo ___$_i$]]?
Zhang even Li DIST force 3SG's friend scold-EXP
Lit. 'Zhang, even Li$_i$, once forced his$_i$ friend to scold (him$_i$).'

d. *IP-internal topicalization and focalization: No Principle C reconstruction*

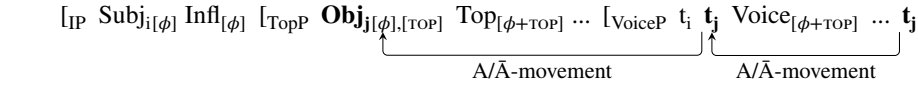
Zhang, [(lian) **Li$_i$-de pengyou**]$_j$, (dou) [$_{VoiceP}$ bi ta$_i$ [$_{VoiceP}$ ma-guo ___$_j$]].
Zhang even Li's friend DIST force 3SG scold-EXP
'Zhang, (even) Li$_i$'s friend$_j$, once forced him$_i$ to scold (him$_j$).'

In contrast to existing work that analyzes IP-internal topicalization and focalization as instances of A-movement, thereby overlooking their lack of A-minimality/locality effects and the presence of information-

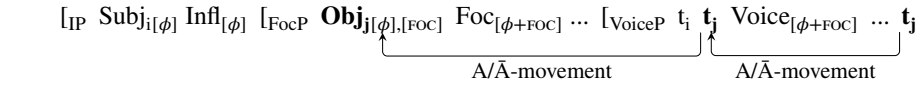
[4] In (7), *meiyou-ren* 'nobody' resists topicalization; hence, (7-b) cannot have a derivation where (i) the embedded object undergoes IP-external topicalization to precede the matrix subject, and (ii) the matrix subject undergoes further topicalization to precede the topicalized embedded object.

structural effects, I propose that IP-internal topicalization and focalization involve successive-cyclic composite A/Ā-movement via Spec, VoiceP, terminating at IP-internal Spec, TopP, and Spec, FocP, respectively, as illustrated in (9). This derivation necessitates that both the Voice head, as a phase head, and the IP-internal Top and Foc heads host the composite probes [ϕ + TOP] and [ϕ + FOC], and it follows that this composite A/Ā-movement should exhibit mixed A/Ā-properties.

(9) a. *Mandarin: IP-internal topicalization as successive-cyclic composite movement*



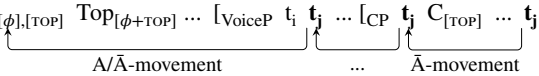
b. *Mandarin: IP-internal focalization as successive-cyclic composite movement*



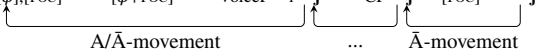
Furthermore, it is important that the Mandarin C head, also as a phase head, only hosts *pure Ā-probes* (e.g., [TOP], [FOC]) and not the composite probes [ϕ + TOP] and [ϕ + FOC].[5] Consequently, Ā-movement to Spec, CP cannot feed composite A/Ā-movement to the IP-internal Spec, TopP and Spec, FocP, due to the ban on improper composite A/Ā-movement after Ā-movement (see e.g., Longenbaugh 2017; Chen 2023).

(10) *Improper composite A/Ā-movement after Ā-movement*

a. *[IP Subj i[ϕ] Infl[ϕ] [TopP Obj j[ϕ],[TOP] Top[ϕ+TOP] ... [VoiceP ti tj ... [CP tj C[TOP] ... tj (...)]]]]



b. *[IP Subj i[ϕ] Infl[ϕ] [FocP Obj j[ϕ],[FOC] Foc[ϕ+FOC] ... [VoiceP ti tj ... [CP tj C[FOC] ... tj (...)]]]]



4. IP-external topic and focus movement via intermediate composite movement

Unlike IP-internal topicalization and focalization, which are clause-bound, and like typical Ā-movement, IP-external topicalization and focalization can establish a long-distance dependency between the IP-external topic or focus NP and a deeply embedded object gap across a finite clause boundary:

(11) *IP-external topicalization and focalization: Long-distance dependency across finite boundary*

[(Lian) **zhe-jian shi**]$_i$, Li (dou) xiangxin/zhidao [$_{CP}$ Zhang hui diaocha ___$_i$].
even this-CL matter Li DIST believe/know Zhang will investigate
'(Even) this matter$_i$, Li believes/knows that Zhang will investigate (it$_i$).'

Also unlike IP-internal topicalization and focalization, IP-external topicalization and focalization do not create new antecedents for anaphor binding, regardless of whether the anaphor is present between the IP-external topic or focus NP and the matrix VoiceP, as in (12-a), or between the embedded CP and the embedded VoiceP, as in (12-b), or between the matrix VoiceP and the embedded VoiceP, as in (12-c) (cf. Qu 1994; Ting 1995; Shyu 1995; Kuo 2009).

[5] In Chen (2023), it is argued that the Mandarin C head also hosts a *pure ϕ-probe*, which is active in the case of hyperraising to subject via Spec, CP. Hence, both an [A]-feature and [Ā]-features are present on the Mandarin C head, but, crucially, they probe separately and independently.

(12) *IP-external topicalization and focalization: No new antecedents for anaphor binding*

a. *... anaphor **between topic/focus and matrix VoiceP***
*[(Lian) **Li**]$_i$, ta-ziji$_i$-de pengyou (dou) [$_{VoiceP}$ ma-guo ___$_i$].
even Li 3SG-self's friend DIST scold-EXP
INT: '(Even) Li$_i$, his$_i$ friend once scolded (him$_i$).'

b. *... anaphor **between embedded CP and embedded VoiceP***
*[(Lian) **Li**]$_i$, Zhang (dou) xiangxin/zhidao [$_{CP}$ ta-ziji$_i$-de pengyou [$_{VoiceP}$ ma-guo ___$_i$]].
even Li Zhang DIST believe/know 3SG-self's friend scold-EXP
INT: '(Even) Li$_i$, Zhang believes/knows that his$_i$ friend once scolded (him$_i$).'

c. *... anaphor **between matrix VoiceP and embedded VoiceP***
*[(Lian) **Li**]$_i$, Zhang (dou) [$_{VoiceP}$ bi ta-ziji$_i$-de pengyou [$_{VoiceP}$ ma-guo ___$_i$]].
even Li Zhang DIST force 3SG-self's friend scold-EXP
INT: '(Even) Li$_i$, Zhang once forced his$_i$ friend to scold (him$_i$).'

More interestingly, whether IP-external topicalization and focalization are subject to weak crossover and Principle C reconstruction depends on the position of the pronoun co-indexed with the IP-external topic or focus NP in the given configurations (cf. Qu 1994).[6] Specifically, IP-external topicalization and focalization are subject to weak crossover, when the co-indexed pronoun is outside the VoiceP phase(s), as in (13-a), (13-b) and (14-a), (14-b) (cf. Qu 1994; Ting 1995; Shyu 1995; Kuo 2009), but is immune to weak crossover, when the co-indexed pronoun is inside the VoiceP phase(s), as in (13-c) and (14-c) (cf. Qu 1994).

(13) *IP-external topicalization (of quantifier phrase): (No) weak crossover*

a. *... co-indexed pronoun **between topic and matrix VoiceP***
*[**Mei-ge ren**]$_i$, ta$_i$-de pengyou (dou) [$_{VoiceP}$ ma-guo ___$_i$]].
every-CL person 3SG's friend DIST scold-EXP
INT: 'Every person$_i$, his$_i$ friend once scolded (him$_i$).'

b. *... co-indexed pronoun **between embedded CP and embedded VoiceP***
*[**Mei-ge ren**]$_i$, Zhang (dou) xiangxin/zhidao [$_{CP}$ ta$_i$-de pengyou [$_{VoiceP}$ ma-guo ___$_i$]].
every-CL person Zhang DIST believe/know 3SG's friend scold-EXP
INT: 'Every person$_i$, Zhang believes/knows that his$_i$ friend once scolded (him$_i$).'

c. *... co-indexed pronoun **between matrix VoiceP and embedded VoiceP***
[**Mei-ge ren**]$_i$, Zhang (dou) [$_{VoiceP}$ bi ta$_i$-de pengyou [$_{VoiceP}$ ma-guo ___$_i$]].
every-CL person Zhang DIST force 3SG's friend scold-EXP
Lit. 'Every person$_i$, Zhang once forced his$_i$ friend to scold (him$_i$).'

(14) *IP-external focalization: (No) weak crossover*

a. *... co-indexed pronoun **between focus and matrix VoiceP***
*[Lian **Li**]$_i$, ta$_i$-de pengyou (dou) [$_{VoiceP}$ ma-guo ___$_i$]].
even Li 3SG's friend DIST scold-EXP
INT: 'Even Li$_i$, his$_i$ friend once scolded (him$_i$).'

b. *... co-indexed pronoun **between embedded CP and embedded VoiceP***
*[Lian **Li**]$_i$, Zhang (dou) xiangxin/zhidao [$_{CP}$ ta$_i$-de pengyou [$_{VoiceP}$ ma-guo ___$_i$]].
even Li Zhang DIST believe/know 3SG's friend scold-EXP
INT: 'Even Li$_i$, Zhang believes/knows that his$_i$ friend once scolded (him$_i$).'

[6] Qu (1994) fails to identify the link between the presence or absence of weak crossover and Principle C reconstruction and the position of the co-indexed pronoun and simply concludes that IP-external topicalization and focalization may be instances of either A-movement, when they are immune to weak crossover and Principle C reconstruction, or Ā-movement, when they are subject to weak crossover and Principle C reconstruction. This is a logical flaw: if IP-external topicalization and focalization can be instances of A-movement, then any ungrammaticality due to weak crossover or Principle C reconstruction should be circumventable, contrary to fact.

c. *... co-indexed pronoun **between matrix VoiceP and embedded VoiceP***
[Lian **Li**]$_i$, Zhang (dou) [$_{VoiceP}$ bi ta$_i$-de pengyou [$_{VoiceP}$ ma-guo —$_i$]].
even Li Zhang DIST force 3SG's friend scold-EXP
Lit. 'Even Li$_i$, Zhang once forced his$_i$ friend to scold (him$_i$).'

Similarly, IP-external topicalization and focalization show (weak) Principle C reconstruction effects, when the co-indexed pronoun is outside the VoiceP phase(s), as in (15-a) and (15-b),[7] but show no Principle C reconstruction effects, when the co-indexed pronoun is inside the VoiceP phase(s), as in (15-c) (cf. Qu 1994).

(15) *IP-external topicalization and focalization: (No) Principle C reconstruction*[8]

a. *... co-indexed pronoun **between topic/focus and matrix VoiceP***
*/?? [(Lian) **zhe-ge ren$_i$-de pengyou**]$_j$, ta$_i$ (dou) [$_{VoiceP}$ ma-guo —$_j$]].
even this-CL person's friend 3SG DIST scold-EXP
INT: '(Even) this person$_i$'s friend$_j$, he$_i$ once scolded (him$_j$).'

b. *... co-indexed pronoun **between embedded CP and embedded VoiceP***
*/? [(Lian) **zhe-ge ren$_i$-de pengyou**]$_j$, Zhang (dou) xiangxin/zhidao [$_{CP}$ ta$_i$ [$_{VoiceP}$
even this-CL person's friend Zhang DIST believe/know 3SG
ma-guo —$_j$]].
scold-EXP
'(Even) this person$_i$'s friend$_j$, Zhang believes/knows that he$_i$ once scolded (him$_j$).'

c. *... co-indexed pronoun **between matrix VoiceP and embedded VoiceP***
[(Lian) **zhe-ge ren$_i$-de pengyou**]$_j$, Zhang (dou) [$_{VoiceP}$ bi ta$_i$ [$_{VoiceP}$ ma-guo —$_j$]].
even this-CL person's friend Zhang DIST force 3SG scold-EXP
'(Even) this person$_i$'s friend$_j$, Zhang once forced him$_i$ to scold (him$_j$).'

I propose that IP-external topicalization and focalization in Mandarin, which otherwise involve typical successive-cyclic Ā-movement via VoiceP and CP phase edges, can also involve intermediate steps of composite A/Ā-movement to Spec, VoiceP, followed by a terminating step of Ā-movement to IP-external Spec, TopP and Spec, FocP. The intermediate composite A/Ā-movement to Spec, VoiceP is associated with mixed A/Ā-properties (e.g., the lack of weak crossover/Principle C reconstruction), while the terminating Ā-movement to IP-external Spec, TopP and Spec, FocP is associated with Ā-properties (e.g., weak crossover/Principle C reconstruction).

(16) a. *Mandarin: IP-external topicalization via intermediate composite movement*

[$_{TopP}$ **Obj$_{i[\phi],[TOP]}$** Top$_{[TOP]}$ [$_{IP}$ Subj$_{j[\phi]}$ Infl$_{[\phi]}$ ... [$_{VoiceP}$ **t$_i$** t$_j$ Voice$_{[\phi+TOP]}$ ... **t$_i$** (...)]]]

Ā-movement A/Ā-movement

b. *Mandarin: IP-external focalization via intermediate composite movement*

[$_{FocP}$ **Obj$_{i[\phi],[FOC]}$** Foc$_{[FOC]}$ [$_{IP}$ Subj$_{j[\phi]}$ Infl$_{[\phi]}$ ... [$_{VoiceP}$ **t$_i$** t$_j$ Voice$_{[\phi+FOC]}$ ... **t$_i$** (...)]]]

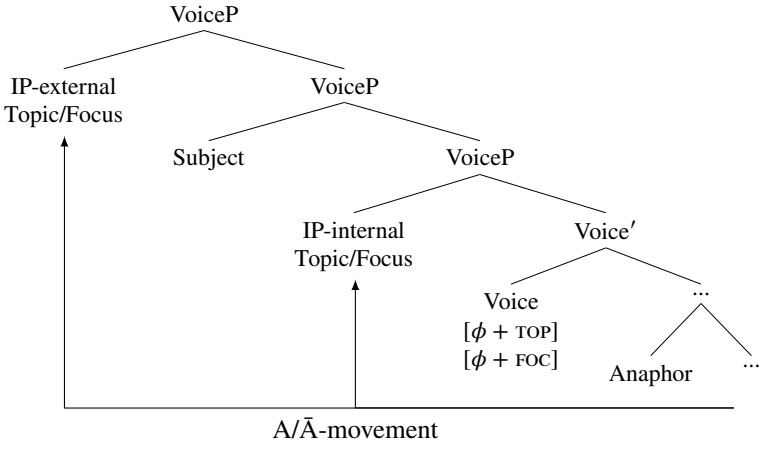
Ā-movement A/Ā-movement

Recall that IP-internal topicalization and focalization can, while IP-external topicalization and focalization cannot, create new antecedents for anaphor binding, even when the anaphor is inside a VoiceP phase. I propose that at the edge of a VoiceP phase, the external argument is the SUBJECT that delimits the binding domain for anaphors. Furthermore, IP-internal topicalization and focalization stop off at an *inner* Spec, VoiceP, below the thematic position of the external argument, while IP-external topicalization

[7] In (15-a), Principle C reconstruction effect is weak with topicalization and stronger with focalization. In (15-b), Principle C reconstruction effect is further weakened with topicalization (cf. Huang 1993: ex. 54c), which might indicate that cross-clausal reconstruction for Principle C is optional with topicalization.

and focalization stop off at an *outer* Spec, VoiceP, above the thematic position of the external argument; in this way, the linear orderings of phrases established by phase-by-phase spell-out are consistent throughout a derivation (see e.g., Fox & Pesetsky 2005; Davis 2020). Consequently, in the former case, the topic or focus NP is *inside* the binding domain for anaphors that lack a more locally accessible SUBJECT, while in the latter case, the topic or focus NP is *outside* the binding domain for anaphors that are bound by the external argument in Spec, VoiceP/its thematic position, the more locally accessible SUBJECT.

(17) *Topicalization/Focalization and anaphor binding at VoiceP phase*



5. A note on Principle A reconstruction

In Mandarin, there is also a contrast between IP-internal and IP-external topicalization and focalization in terms of Principle A reconstruction effects (see e.g., Qu 1994; Ting 1995; Shyu 1995; Kuo 2009):

(18) a. *IP-internal topicalization and focalization: no Principle A reconstruction*
Zhangsan$_i$ [(lian) **ta-ziji$_{i/*j}$-de pengyou**] (dou) bi Lisi$_j$ ma-guo __.
Zhangsan even 3SG-self's friend DIST force Lisi scold-EXP
'Zhangsan$_i$, (even) his$_{i/*j}$ friend, forced Lisi$_j$ to scold (him).'

b. *IP-external topicalization and focalization: Principle A reconstruction*
[(Lian) **ta-ziji$_{i/j}$-de pengyou**], Zhangsan$_i$ (dou) bi Lisi$_j$ ma-guo __.
even 3SG-self's friend Zhangsan DIST force Lisi scold-EXP
'(Even) his$_{i/j}$ friend, Zhangsan$_i$ forced Lisi$_j$ to scold (him).'

Cross-linguistically, there is variation in whether A-movement shows Principle A reconstruction effects. In English, both A-movement and Ā-movement show Principle A reconstruction effects (Belletti & Rizzi 1988; Pesetsky 2013), while in Dutch, only Ā-movement shows Principle A reconstruction effects (see e.g., Neeleman & Van De Koot 2010).

I propose that Mandarin is unlike English and like Dutch in that only Ā-movement shows Principle A reconstruction effects. The contrast in (18) follows because IP-internal topicalization and focalization involve successive-cyclic composite A/Ā-movement, which does not show Principle A reconstruction effects, while IP-external topicalization and focalization can involve typical successive-cyclic Ā-movement, which shows Principle A reconstruction effects.[8]

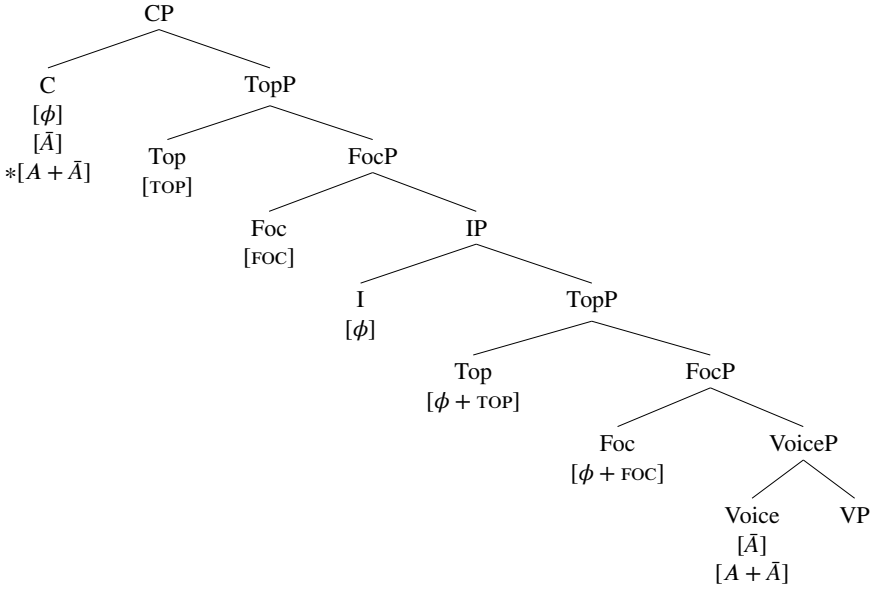
[8] Given the above proposal that the external argument in Spec, VoiceP/its thematic position can bind an anaphor before its A-movement to Spec, IP, it remains puzzling as to why an anaphor cannot be bound at its thematic position before (A-movement and) composite A/Ā-movement. I leave this puzzle and an account of the cross-linguistic variation on Principle A reconstruction effects to future research.

6. Conclusion

To summarize, I have argued that composite probing by the composite probe [A+Ā] is generally observed in Mandarin, in the sense that multiple heads projected in the low IP area host the composite probe [A+Ā], and that the Voice head, as a phase head, generally hosts the composite probe [A+Ā] for purposes of successive-cyclic movement. The evidence has come from two types of topicalization and focalization in Mandarin, which exhibit mixed A/Ā-properties. Specifically, I have argued that IP-internal topicalization and focalization involve successive-cyclic composite A/Ā-movement via Spec, VoiceP, which terminate at IP-internal Spec, TopP and Spec, FocP, respectively, while IP-external topicalization and focalization can involve an intermediate step of composite A/Ā-movement to Spec, VoiceP, followed by a terminating step of Ā-movement to IP-external Spec, TopP and Spec, FocP, respectively.

The proposed analyses lead to the distribution of A-, Ā-, and composite probes in Mandarin low IP area and left periphery in (19). The IP-internal Top head and Foc head host composite A/Ā-probes, [ϕ+TOP] and [ϕ+FOC] respectively, which trigger IP-internal topicalziation and focalization, while the IP-external Top head and Foc head host pure Ā-probes, [TOP] and [FOC] respectively, which trigger IP-external topicalziation and focalization. The Voice head, as a phase head, hosts both composite A/Ā-probes and pure Ā-probes; by contrast, the C head, also as a phase head, does not host composite A/Ā-probes.

(19) *Distribution of A-, Ā-, and composite probes in Mandarin low IP area and left periphery*



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