

# **Towards the unity of movement: implications from verb movement in Cantonese**

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Dissertation Defense

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# 1 Introduction

- This thesis aims to contribute to our understanding of movement theories of natural language.
- I argue that head movement is not substantially different from phrasal movement.
- Structural complexity of the moving element is independent of its movement properties.
- Based on evidence from Cantonese, I show that head movement can be assimilated to phrasal movement.
- This thesis sets the basis of a movement theory that does not discriminate heads from phrases.
- It represents (the continuation of) a minimalist pursuit of movement theories.  
(cf. Toyoshima 2000, 2001; Matushansky 2006; Vicente 2007; Roberts 2010; Hartman 2011; Funakoshi 2014; Matyiku 2017; Harizanov and Gribanova 2019; Harizanov 2019, i.a.)

The empirical foundations are based on verb movement in Cantonese:

(1) a. **Verb doubling constructions**

(where an additional copy of the main verb appears in the left/right periphery)

b. **Movement of quantificational heads**

(where aspectual/modal verbs appear in the non-canonical, pre-subject position)

(2) An example of each phenomenon

a. **Maai** keoi hai **maai**-gwo go-bun syu.

buy s/he COP buy-EXP that-CL book

‘As for buying, s/he has bought that book (but...).’

b. **Hoici** dak Aaming haau-dou hou singzik.

begin only Aaming get-able good result

‘It begins to be the case that only Aaming is getting good results.’

Based on in-depth investigations into these phenomena,

- I present three pieces of evidence for a unified approach to movement.
- They focus on different aspects of head movement:
  - its syntactic properties (in Narrow Syntax)
  - its interpretive properties (in the syntax-semantic interface), and
  - the linearization of its chain (in the syntax-phonology interface).
- They constitute converging evidence from different components of the grammar that head movement can be treated on a par with phrasal movement.

Specific proposals:

- ➊ Head movement is constrained by the same set of locality/minimality requirements as phrasal movement (cf. Chomsky 1995; Rizzi 1990, 2001, 2004);
- ➋ Head movement exhibits the same range of possible interpretive effects as phrasal movement, and is also constrained by Scope Economy (Fox 2000);
- ➌ Head movement chains are linearized by the same mechanism as phrasal movement chains, i.e., Cyclic Linearization and copy deletion (Fox and Pesetsky 2005).

## Consequences:

- The phrase structure status of syntactic constituents bears a minimal role in theorizing displacement phenomena in natural language.
- We can maintain the formulation of the structure-building operation in its simplest form.  
→ there is no structure-building operations specific to a particular structural type
- We can maximize the explanatory power of our existing theory of (phrasal) movement.

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## 2 Approaching head movement

There is a constant tension between the theoretical desire for unification and diverse empirical properties of head movement/displacement.

- (3) A very brief review of the development of head movement
  - a. 1970s: independent transformational rules on verbs (e.g., Emonds 1976; Besten 1983)
  - b. 1980s: the adjunction approach to head movement (Koopman 1984; Travis 1984; Baker 1985)
  - c. 1990s: the minimalist critiques and the debates over the locality conditions
  - d. 2000s: the debates over the interpretive effects (among other issues)



The notion of head movement at the crossroads:

(4) Non-unity approaches to head and phrasal movement

- a. Eliminating head movement from the syntax
  - ➔ Post-syntactic movement/operations
  - ➔ Remnant phrasal movement
- b. Reformulating head movement in the syntax

(5) Recent pursuits of a unified theory of movement

- a. Head movement to the specifier position
- b. No head-specific locality constraint
- c. The interpretative effects of head movement

### 3 Intervention effects: verb movement to peripheral positions

The leading question: how is head movement constrained w.r.t. locality?

The debate on locality based on structure types vs. syntactic features:

- Head movement is disrupted by **intervening heads**, i.e., the Head Movement Constraint (Travis 1984)
- This is empirically challenged by cases of
  - (i) Long Head Movement, e.g. in Breton (Borsley, Rivero, and Stephens 1996, i.a.), and
  - (ii) predicate cleft constructions, e.g., in Spanish (Vicente 2007, i.a.)
- I argue that the locality condition on head movement should be formulated in featural terms (cf. Toyoshima 2001; Roberts 2001; Matushansky 2006)
- Head movement is disrupted by **intervening (matching) features**.

The novel observations come from **Focus Intervention Effects** in verb doubling constructions.

(6) Four verb doubling constructions in Cantonese

- a.  $\boxed{V}$  SVO: Topic constructions of verbs  
Maai keoi hai maai-gwo go-bun syu. (cf. Cheng and Vicente 2013, p.13)  
buy s/he COP buy-EXP that-CL book  
'As for buying, s/he has bought that book (but...).'
- b. Lin- $\boxed{V}$  SVO: 'Even'-focus constructions of verbs  
Lin tai keoi dou m-tai ni-bun syu. (cf. Cheng and Vicente 2013, p.2)  
even read s/he also not-read this-CL book  
'S/he didn't even READ this book.'
- c. Hai- $\boxed{V}$  SVO: Copula focus constructions of verbs  
Hai dim Aaming m-gam dim ni-zek dungmat ze1.  
COP touch Aaming not-dare touch this-CL animal SFP  
'Aaming dare not to TOUCH this animal only.'
- d. SVO SFP  $\boxed{V}$ : Right dislocation/dislocation copying of verbs  
Zoengsaam gammaan fan ni-zoeng cong aa3 fan. (Chan 2016, p.18, adapted)  
Zoengsaam tonight sleep this-CL bed SFP sleep  
'Zoengsaam (will) sleep on this bed tonight.'

### 3.1 Summary of the empirical properties of verb doubling constructions

Type	Left Periphery	S	Marker	V <sub>base</sub>	O	SFP	Right Periphery
Topic-V	<b>V</b>	S	<i>(hai)</i>	<b>V</b>	O	<i>(ge2)</i>	-
'Even'-V	<i>(lin-)</i> <b>V</b>	S	<i>dou</i>	<b>V</b>	O	(any SFP)	-
Copula-V	<i>hai-</i> <b>V</b>	S	-	<b>V</b>	O	<i>ze1/zaa3</i>	-
DC-V	-	S	-	( <b>V</b> )	O	any SFP	<b>V</b>

Table 1: The schematic patterns of verb doubling constructions

Type	Discourse effects	Contrastiveness	Relative order with topics
Topic-V	contrastive topic	✓	Topic > V / *V > Topic
'Even'-V	additive focus	✓	Topic > V / *V > Topic
Copula-V	exhaustive focus	✓	Topic > V / *V > Topic
DC-V	defocused/given elements	✗	*Topic > V / ??V > Topic

Table 2: The discourse effects of the verb doubling constructions

## 3.2 Evidence for verb movement

I argue that the two verbs in verb doubling constructions involve syntactic movement, based on evidence from **lexical identity effects**.

(7) Lexical identity, but not semantic entailment, is crucial

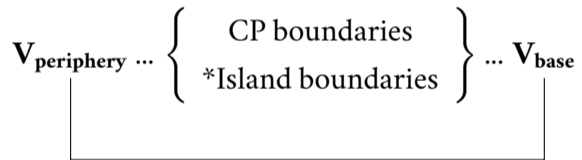
- a. {**caau**/ \*zyu} ngo hai soeng **caau** coi ge2.  
fry cook I COP want fry vegetable SFP  
'As for frying/ cooking, I want to fry the vegetables.'
- b. Lin {**paau**/ \*juk} Aaming dou m-gam **paau**.  
even run move Aaming also not-dare run  
'Aaming doesn't even dare to RUN/MOVE.'
- c. Hai {**mo**/ \*dim} Aaming m-gam **mo** ni-zek dungmat ze1.  
COP pet touch Aaming not-dare pet this-CL animal SFP  
'Aaming dare not to PET/TOUCH this animal only.'
- d. Aaming haanin **fei** Meigwok aa3 {**fei**/ \*heoi}  
Aaming next.year fly US SFP fly/ go  
'Aaming (will) fly to US next year.'

(8) Lexical identity, but not semantic identity, is crucial

- a. {**caa**/ \*cek} ngo hai **caa**-gwo ni-go jan  
check/ check I COP check-EXP this-CL person  
'As for checking, I have checked this person.'
- b. Lin {**kip**/ \*bougun} Aaming dou m-soeng **kip**.  
even keep keep Aaming also not-want keep  
'Aaming doesn't even want to KEEP (it).'
- c. Hai {**pisen**/ \*bougou} keoi mou seonsam **pisen**-dak hou ze1.  
COP present present s/he not.have confidence present-RES good SFP  
'S/he lacks the confidence to PRESENT well only.'
- d. Aaming tingjat wui **fong** ni-di gupiu aa3 {**fong**/ \*maai}  
Aaming tomorrow will see this-CCL stock SFP sell sell  
'Aaming will sell these stocks tomorrow.'

Evidence from **island sensitivity**: the two verb cannot span across syntactic “islands” (but can do so across a complement clause)

(9) A schematic representation of the locality effects in verb doubling constructions



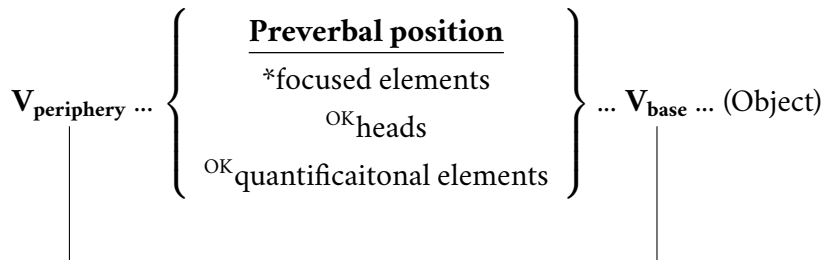
(Note: “islands” include (i) NP complements clauses, (ii) relative clauses, (iii) adjunct clauses, and (iv) sentential subject.)

### 3.3 Focus Intervention Effects

- In addition to islands, focused elements also disrupt the dependency between the two verbs.
- These focused elements include (i) *dak* ‘only’ focus, and (ii) *wh*-expressions.
- They only disrupt the dependency when they occur in the pre-verbal position.

#### (10) Focus Intervention Effects in verb doubling constructions

Focused elements cannot intervene between the verb in the peripheral position and the verb in the base position in (i) topic, (ii) ‘even’-focus, and (iii) copula focus constructions of verbs.





(i) *dak* 'only' focus

(11) Subject vs. object focus in **topic constructions of verbs**

- a. \***Heoi** dak Aaming<sub>Focus</sub> hai soeng **heoi** Meigwok.  
go only Aaming COP soeng heoi US  
'As for going, only Aaming wants to go to the US.'
- b. **Heoi** Aaming hai **heoi**-dak jat-go deifong<sub>Focus</sub>.  
go Aaming COP go-only one-CL place  
'As for going, Aaming has been to only one place.'

(12) Subject vs. object focus in **copula focus constructions of verbs**

- a. \*Hai **maai** dak Aaming<sub>Focus</sub> **maai**-m-hei ni-gaan uk ze1. Keoi zou-dak-hei.  
COP buy only Aaming buy-not-up this-CL house SFP he rent-able-up  
'Only Aaming cannot BUY this house only. He can (afford) renting it.'
- b. Hai **maai** Aaming jinghai **maai**-dak jat-gaan uk<sub>Focus</sub> ze1. Zou gewaa keoi hoji  
COP buy Aaming only buy-only one-CL house SFP rent if he can  
zou gei-gaan.  
rent several-CL  
'Aaming can BUY only one house only. If (it is about) renting, he can (afford) renting several houses.'

(ii) *wh*-expressions

(Assuming *wh*-expressions bear inherent focus interpretation)

(13) Subject vs. object *wh*-expressions in **topic constructions of verbs**

a. \***Soeng** bingo<sub>Focus</sub> hai **soeng** heoi Meigwok?

want who COP want go US

'Who wants to go to the US?'

b. **Soeng** Aaming hai **soeng** heoi bindou<sub>Focus</sub>?

want Aaming COP want go where

'Where does Aaming want to go?'

(14) Subject vs. object *wh*-expressions in '**even**'-focus constructions of verbs

a. \*Lin **haang** bingo<sub>Focus</sub> dou **haang**-m-dou sap fanzun?

even walk who also walk-not-able ten minute

'Who can't even WALK for ten minutes?'

b. Lin **haang** Aaming dou **haang**-m-dou geidou fanzung<sub>Focus</sub>.

even walk Aaming also walk-not-able how.many minute

'For how many minutes does Aaming even fail to WALK?'

However, dislocation copying of verbs are insensitive to focused elements.

(15) Subject vs. object focus in **dislocation copying of verbs**

a. dak Aaming<sub>Focus</sub> gammaan **hoji** fan baat-go zung zaa3 **hoji**.  
only Aaming tonight can sleep eight-CL hour SFP can  
'Only Aaming can sleep for eight hours tonight.'

b. Aaming gammaan jinghai **hoji** fan-dak jat-go zung<sub>Focus</sub> zaa3 **hoji**.  
Aaming tonight only can sleep-only one-CL hour SFP can  
'Aaming can sleep for only one hour tonight.'

(16) Subject vs. object *wh*-expressions in **dislocation copying of verbs**

a. Bingo<sub>Focus</sub> gammaan **hoji** fan baat-go zung aa3 **hoji**?  
who tonight can sleep eight-CL hour SFP can  
'Who can sleep for eight hours tonight?'

b. Aaming gammaan **hoji** fan geinoi<sub>Focus</sub> aa3 **hoji**?  
Aaming tonight can sleep how.long SFP can  
'How long can Aaming sleep tonight?'

Importantly, heads can appear between the two verbs (violating the Head Movement Constraint).

(17) No intervention effects triggered by intervening verbs

- a. **Heoi**, Aaming hai soeng **heoi** Meigwok ge2.  
go Aaming COP want go US SFP  
'As for going, Aaming wants to go to the US.'
- b. Lin **gong** Aaming dou m-sik **gong**.  
even speak Aaming also not-know speak  
'Aaming doesn't even know how to SPEAK.'
- c. Hai **dim** Aaming m-gam **dim** ni-zek dungmat ze1. = (6c)  
COP touch Aaming not-dare touch this-CL animal SFP  
'Aaming dare not to TOUCH this animal only.'
- d. Aaming wui **heoi** maai ni-bun syu aa3 **heoi**.  
Aaming will go buy this- book SFP go  
'Aaming will go to buy this book.'

### 3.4 Proposal: verb movement to the CP periphery

In all four constructions, the verb moves to the CP domain triggered by discourse features.

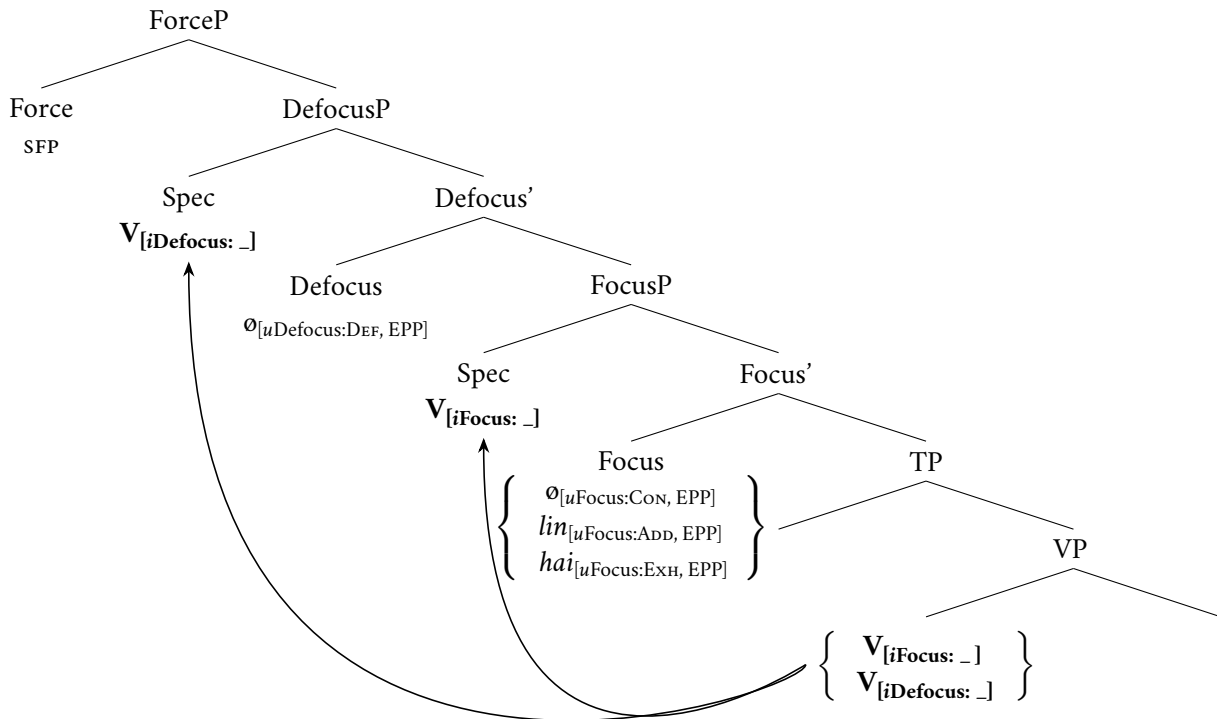
Feature	Uninterpretable feature	Interpretable feature
Focus feature	[ <i>u</i> Focus: CON/ADD/EXH]	[ <i>i</i> Focus: _]
Defocus feature	[ <i>u</i> Defocus: DEF]	[ <i>i</i> Defocus: _]

Table 3: Feature specification of the focus and defocus features in Cantonese

Construction	Head in the CP domain	Feature	Phonological realization
Topic-V	Focus	[ <i>u</i> Focus: CON]	null ( $\emptyset$ )
'Even'-V	Focus	[ <i>u</i> Focus: ADD]	<i>lin</i> or null ( $\emptyset$ )
Copula-V	Focus	[ <i>u</i> Focus: EXH]	<i>hai</i>
DC-V	Defocus	[ <i>u</i> Defocus: DEF]	null ( $\emptyset$ )

Table 4: Distribution of the uninterpretable focus/defocus features and their realizations

(18) A schematic representation of the proposed head-to-specifier movement



The derivation continues with SFP-driven movement.

(19) SFP-driven movement (to the specifier position of ForceP)

a.  $[_{\text{ForceP}} [_{\text{FocusP}} \mathbf{V}_{[i\text{Focus}]} \dots] [_{\text{Force}'} \text{SFP} \quad \quad \quad t_{\text{FocusP}} ] ]$       FocusP movement

b.  $[_{\text{ForceP}} [_{\text{TP}} \dots] \quad \quad \quad [_{\text{Force}'} \text{SFP} [_{\text{DefocusP}} \mathbf{V}_{[i\text{Defocus}]} \quad \quad \quad t_{\text{TP}} ] ] ]$       TP movement

c.  $[_{\text{ForceP}} [_{\text{FocusP}} \mathbf{V}_{[i\text{Focus}]} \dots] [_{\text{Force}'} \text{SFP} [_{\text{DefocusP}} \mathbf{V}_{[i\text{Defocus}]} \quad \quad \quad t_{\text{FocusP}} ] ] ]$       FocusP movement

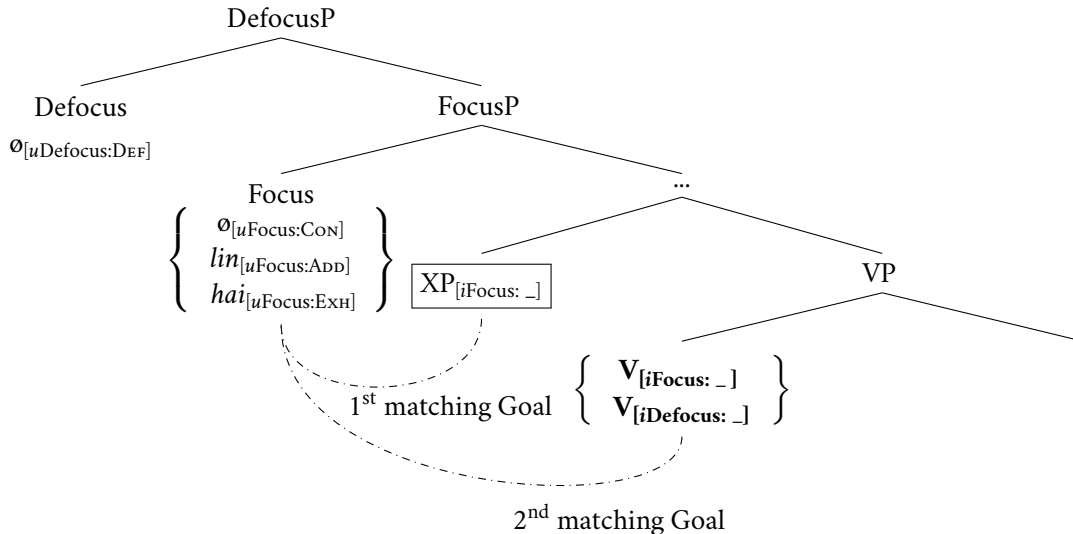
(20) Co-occurrence of DefocusP and FocusP

a. **Maai**, Aaming **jinggoi** hai soeng **maai** ge2 **jinggoi**.  
 buy Aaming should COP want buy SFP should  
 'As for buying, Aaming probably wants to buy this book.'

b. Lin **sik** Aaming dou **jiu** **sik** zeoi gai ge je aa3 **jiu**  
 even eat Aaming also want eat most expensive MOD thing SFP want  
 'Aaming even wants to EAT the most expensive thing.'

The FIEs observed in verb doubling constructions are due to the locality condition on Agree.

(21) A configuration of Focus Intervention Effects in verb doubling constructions



(Note: the  $[i\text{Focus:}_]$  on the XP is not a matching for the Defocus head.)



The derivation in (21) would be well-formed if the Focus head Agrees with XP, instead of the verb.

(22) Focus heads Agree with intervening focused elements

a. Lin bingo<sub>Focus</sub> dou tai-gwo ni-bun syu?

even who also read-EXP this-CL book

‘Even WHO has read this book?’

b. Hai dak Aaming<sub>Focus</sub> m-gam dim ni-zek dongmat ze1.

COP only Aaming not-dare touch this animal SFP

‘Only AAMING does not dare to touch this animal.’

## 3.5 Discussions and implications

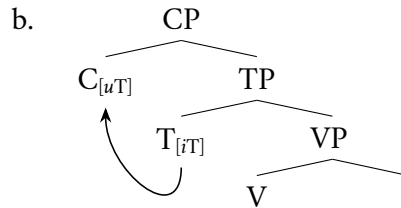
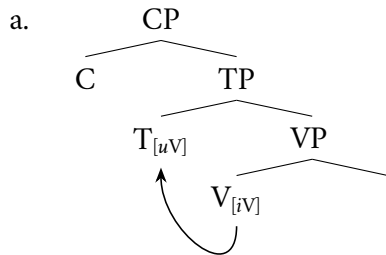
### ❶ Reformulating the Head Movement Constraint

- The HMC cannot be maintained as a general locality condition on head movement.
- The locality constraint on head movement should be reformulated based on featural interveners, instead of structural interveners.
  - the locality constraint on head movement is no different from phrasal movement
- If so, then the evidence previously taken to support the HMC is now in need of explanation.
- I suggest to resort to categorial selection, or *C-selection*, as suggested in Matushansky (2006).

### (23) Categorial selection (C-selection, Matushansky 2006, p.76)

A head may select the syntactic category (and the lexical content) of the head of its complement.

### (24) Illusions of head movement triggered by C-selection/C-features



② A parallel analysis with phrasal movement (i.e., both are triggered by discourse features)

	(i) topic	(ii) 'even'-focus	(iii) copula focus	(iv) right dislocation
Verb	$\boxed{V}$ SVO	<i>lin-</i> $\boxed{V}$ SVO	<i>hai-</i> $\boxed{V}$ SVO	SVO <sub>SFP</sub> $\boxed{V}$
Object	$\boxed{O}$ SV	<i>lin-</i> $\boxed{O}$ SV	<i>hai-</i> $\boxed{O}$ SV	SV <sub>SFP</sub> $\boxed{O}$
VP	$\boxed{VP}$ SV	<i>lin-</i> $\boxed{VP}$ SV	<i>hai-</i> $\boxed{VP}$ SV	SV <sub>SFP</sub> $\boxed{VP}$

Table 5: Verb, Object NP and VP can be targeted in the same constructions

(25) A uniform movement analysis

a. [*i*Focus]/[*i*Defocus] on **verbs**

... [<sub>FocusP/DefocusP</sub> Spec Focus/Defocus ... [<sub>VP</sub> V<sub>[*i*Focus/*i*Defocus]</sub> Object ] ]

b. [*i*Focus]/[*i*Defocus] on **objects**

... [<sub>FocusP/DefocusP</sub> Spec Focus/Defocus ... [<sub>VP</sub> V Object<sub>[*i*Focus/*i*Defocus]</sub> ] ]

c. [*i*Focus]/[*i*Defocus] on **verb phrases**

... [<sub>FocusP/DefocusP</sub> Spec Focus/Defocus ... [<sub>VP</sub><sub>[*i*Focus/*i*Defocus]</sub> V Object ] ]

### ③ Focus Intervention Effects in phrasal movement

#### (26) Focus Intervention Effects observed with verb phrases

- a. \***Zigei zyu faan sik**, dak Aaming<sub>Focus</sub> hai m-hang ge2.  
self cook rice eat only Aaming COP not-willing SFP  
'Cooking on his own, only Aaming is not willing to (do so).'
- b. ??Lin **dim-haa ni-zek dungmat** ngo dou gokdak dak Aaming<sub>Focus</sub> m-gam.  
even touch-DEL this-CL animal I also think only Aaming not-dare  
'I think that only Aaming does not even dare to TOUCH THIS ANIMAL.'
- c. \*Hai **heoi haangsaan** dak Aaming<sub>Focus</sub> m-soeng zaa3.  
COP go hiking only Aaming not-want SFP  
'Only Aaming does not want to GO HIKING only.'
- d. Dak Aaming<sub>Focus</sub> kyutding-zo zaa3 **heoi Meigwok duksyu**.  
only Aaming decide--PERF SFP go US study  
'Aaming has decided to go to the US for study.'

(In the object cases, no Focus Intervention Effects are observed. I suggest that this is due to the possibility of base generation analysis involving a *pro*.)

## 4 Scope effects: movement of quantificational heads

The leading question: Does head movement induce interpretive effects?

- Head movement is said to be semantically inert (Chomsky 2001; Harley 2004, 2013; Platzack 2013), especially for cases of head movement in the core inflectional system.  
→ head movement might be an operation in the phonological component.
- I however argue that the lack of semantic effects is not a general property of head movement.
- Movement of quantificational heads in Cantonese can induce scope effects.
- The application of their movement is predictable under Scope Economy (Fox 2000), a constraint on movement that is independently motivated by the study of Quantifier Raising.
- This implicates that head movement is a syntactic operation, and it does not differ from phrasal movement in their potentials to induce semantic effects.

Potential reasons why head movement appears to lack semantic effects:

- The *trigger* of the movement:  
If a movement is triggered by categorial features (Svenonius 1994; Holmberg 2000; Julien 2002), then the movement might not impose semantic effects, since categorial features are commonly assumed to be purely formal/syntactic.
- The *semantic types* of the moving heads:  
The most discussed cases of head movement involve non-quantificational heads. Their interpretation is the same in the launching site or the landing position (Matushansky 2006; Vicente 2007).

Predictions:

- (27) Head movement may impose semantic effects if
- a. the movement is not triggered by categorial/purely formal features; or
  - b. the head is of a quantificational type (i.e.,  $\langle\langle\alpha,t\rangle,t\rangle$ ).

This opens up a line of research focusing on quantificational heads:

Head	Language	Scope effects	Reference(s)
Determiner	Japanese	enhanced restriction	Takahashi (2002)
Negation	English	NPI licensing	Roberts (2010) and Szabolcsi (2010)
	Japanese	NPI licensing	Kishimoto (2007)
	English varieties	outscope subjects	Matyiku (2017) and Landau (2020)
	Korean	outscope objects	Han, Lidz, and Musolino (2007)
	Japanese	outscope objects	Sato and Maeda (2021)
Modal verb	English	outscope subjects	Lechner (2007, 2017)
	English	outscope negation	Iatridou and Zeijlstra (2013) and Homer (2015)
Aspectual verb	Shupamem	outscope subjects	Szabolcsi (2010, 2011)

Table 6: Summary of evidence of scope effects with head movement

However, the reported evidence is not uncontroversial (Hall 2015; McCloskey 2016).

## 4.1 The distribution of aspectual verbs and modal verbs

### (i) Aspectual verbs

#### (28) The low and high positions of *hoici* 'begin'

- a. Dak Aaming **hoici** haau-dou hou singzik. 'only' > 'begin' / \*'begin' > 'only'  
only Aaming begin get-able good result  
'Only Aaming is such that he begins to get good results.'
- b. **Hoici** dak Aaming haau-dou hou singzik. \*'only' > 'begin' / 'begin' > 'only'  
begin only Aaming get-able good result  
'It begins to be the case that only Aaming is getting good results.'

#### (29) The canonical low position of *houci* 'begin'

- a. Aaming **hoici** haau-dou hou singzik.  
Aaming begin get-able good result  
'Aaming begins to get good results.'
- b. \***Hoici** Aaming haau-dou hou singzik.  
begin Aaming get-able good result  
Int: 'Aaming begins to get good results.'



(ii) Modal verbs

(30) The deontic modal *hoji* ‘may’ and the future modal *wui* ‘will’

a. Ngo deoi [gamjat (dak) Aaming { **hoji/ wui** } zou fan] mou jigin.

I to today only Aaming may/ will early sleep not.have opinion

‘I have no opinion on (the claim that) (only) Aaming may/will sleep early today.’

b. Ngo deoi [ gamjat { **hoji/ wui** } \*(dak) Aaming zou fan] mou jigin.

I to today may/ will only Aaming early sleep not.have opinion

‘I have no opinion on (the claim that) it is allowed/it will be the case that (only) Aaming sleeps early today.’

High positions licensed by immediately following **quantificational** elements:

(31) Group denoting quantifiers vs. pronouns in the subject position

a. **Gaizuk** {SUBJ jau jat-go jan } \_\_ haau-dou hou singzik.  
continue have one-CL person get-able good result  
'It continues to be the case that one person is getting good results.'

b. \***Gaizuk** {SUBJ keoi } \_\_ haau-dou hou singzik.  
continue he get-able good result  
Int.: 'It continues to be the case that he is getting good results.'

(also licensed by quantificational topics, adverbials, and subordinate clauses)

High positions licensed by immediately following **focused** elements:

(32) Copula focus and the high position

a. **Hoji** hai Aaming heoi Hoenggong.

may COP Aaming go Hong.Kong

‘It may be the case that Aaming (but not others) goes to Hong Kong.’

b. \***Hoji** Aaming hai heoi Hoenggong.

may Aaming COP go Hong.Kong

Int.: ‘It may be the case that Aaming goes to Hong Kong (but not other places).’

(also: (i) contrastively focused elements, (ii) ‘even’-marked elements, and (iii) *wh*-expressions)

Summaries of the empirical properties:

(33) The types of verbs in the high position

- a. Only raising predicates can occur in the (restricted) high position.
- b. Epistemic modals can freely occupy the pre-subject position.

(34) Licensing conditions of the high position

A high position of aspectual verbs and deontic/future modals is licensed iff the constituent that immediately follows this position (i) is **quantificational** or (ii) receives a **focus** interpretation.

(35) The high position licensed by the (immediately) following quantificational/focused element

- a. <sup>OK</sup> **Asp./Mod.** [TP/CP XP<sub>[+quantificational/+focus]</sub> ...]
- b. \* **Asp./Mod.** [TP/CP XP<sub>[-quantificational/-focus]</sub> ...]

## 4.2 Proposal: scope-shifting head movement

I assume a raising analysis of aspectual verbs and modal verbs.

(36) The basic structure of sentences with aspectual verbs and deontic/future modals

$[_{TP} \text{Subj}_i [_{\text{AspP/ModP}} \mathbf{Asp./Mod.} [_{\nu P} t_i V (\text{Obj}) ] ] ]$

❶ I propose heads can undergo overt scope-shifting movement.

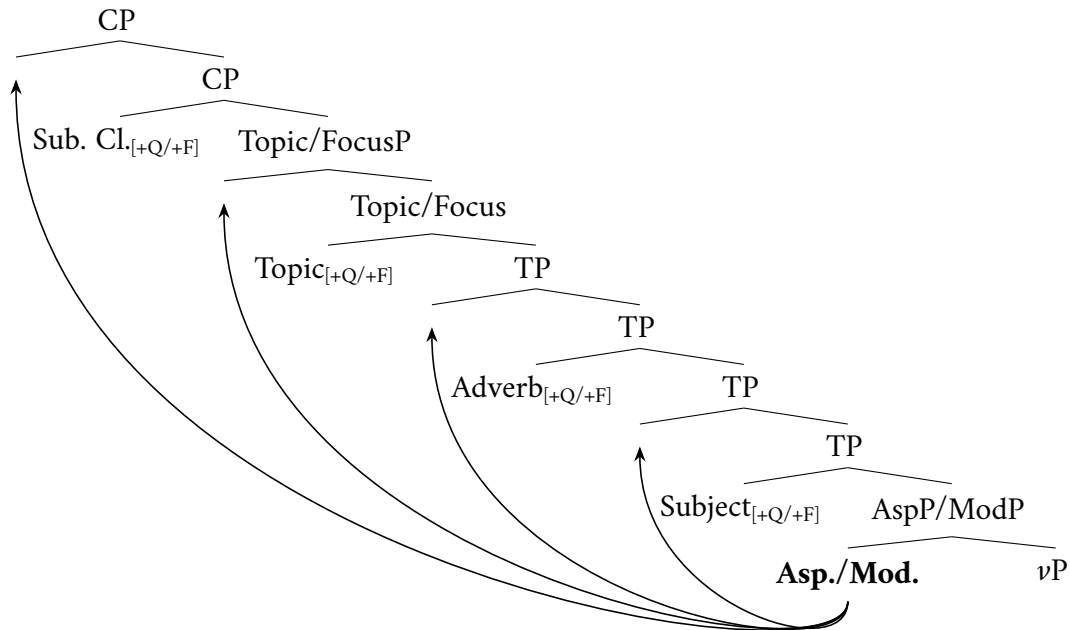
(37) The proposed overt head movement

$[_{TP} \mathbf{Asp./Mod.} [_{TP} \text{Subj}_i \text{ \_\_ } [_{\nu P} t_i V (\text{Obj}) ] ] ]$



scope-shifting head movement

(38) A schematic representation of the proposed head movement



② The movement involves quantificational heads and is constrained by Scope Economy (Fox 2000).


	Aspectual verbs	Deontic/Future modal verbs
Core meaning	generalized quantifiers over times	generalized quantifiers over worlds
Semantic type	$\langle\langle i, t \rangle, t \rangle$	$\langle\langle s, t \rangle, t \rangle$

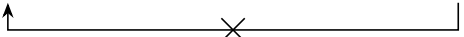
Table 7: A parallel quantificational analysis of aspectual verbs and modal verbs

(39) Scope Economy (Fox 2000, p.23, modified)

Scope-shifting operations must have a semantic effect.

(40) The high position licensed by the (immediately) following quantificational/focused element

a. <sup>OK</sup> **Asp./Mod.**  $[_{TP/CP} XP_{[+quantificational/+focus]} \dots \_ \dots$   
  
 Movement with semantic effects

b. \***Asp./Mod.**  $[_{TP/CP} XP_{[-quantificational/-focus]} \dots \_ \dots$   
  
 Movement without semantic effects

→ Deriving the **quantificational scope** effects:

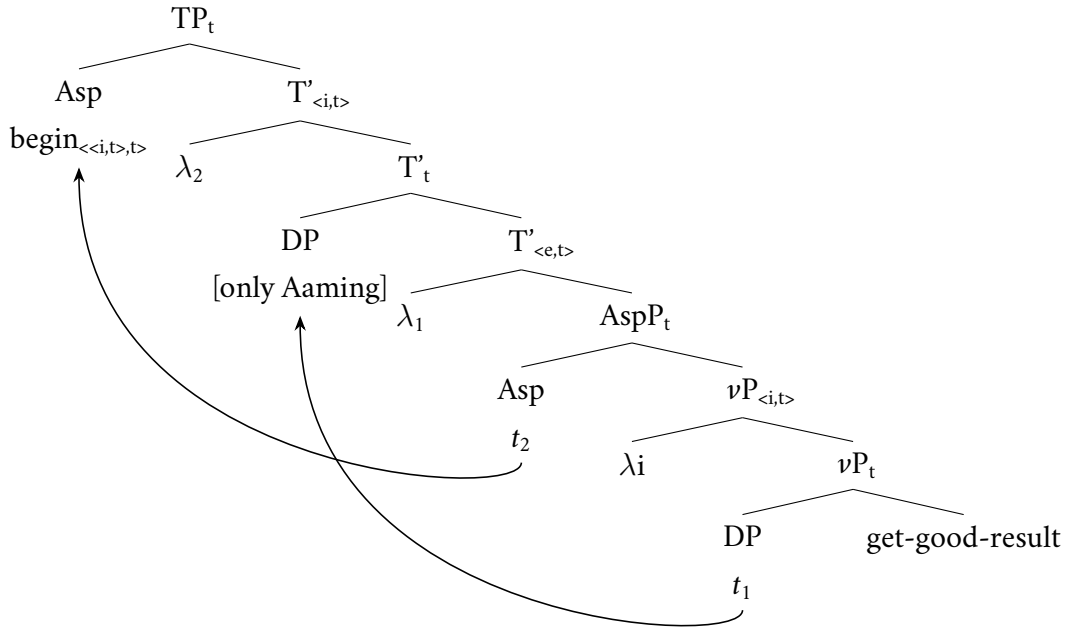
(41) The lexical semantics of *hoici* ‘begin’ (largely based on Szabolcsi 2010, 2011)

$$[[hoici]] = \lambda P_{\langle i,t \rangle}. \exists t' \exists t'' [ t' < t^* \leq t'' \wedge P(t') = 0 \wedge P(t'') = 1 ]$$

(where  $t^*$  is a time variable whose value is contextually determined)

(42) A compositional analysis and the semantics of (28b)

a.



b.  $[[42a)] = \exists t' \exists t'' [ t' < t^* \leq t'' \wedge [ \text{only Aaming } \lambda x. \text{ get-good-result}(x)(t') = 0 ] \wedge [ \text{only Aaming } \lambda x. \text{ get-good-result}(x)(t'') = 1 ] ]$



→ Deriving the **focus scope** effects:

(43) The ordinary and alternative semantic values of (43a)

a. Hai Aaming **hoji** heoi Hoenggong. baseline of (32a)

COP Aaming may go Hong.Kong

'It may be the case that Aaming (but not others) goes to Hong Kong.'

b.  $[[43a]]^O =$  Aaming may go to Hong Kong.

c.  $[[43a]]^{alt} = \left\{ \begin{array}{l} \text{Aafan may go to Hong Kong.} \\ \text{John may go to Hong Kong.} \\ \text{Mary may go to Hong Kong.} \\ \dots \end{array} \right\}$  subject focus

(44) Focus scope effects of the proposed head movement

a. **Hoji** hai Aaming heoi Hoenggong. = (32a)

may COP Aaming go Hong.Kong

'It may be the case that Aaming (but not others) goes to Hong Kong.'

b.  $[[44a]]^O =$  Aaming may go to Hong Kong.

c.  $[[44a]]^{alt} =$  It is allowed that  $\left\{ \begin{array}{l} \text{Aafan goes to Hong Kong.} \\ \text{John goes to Hong Kong.} \\ \text{Mary goes to Hong Kong.} \\ \dots \end{array} \right\}$  subject focus

→ Deriving the restriction on verbs:

(i) Control verbs An explanation that makes reference to *semantic types* of verbs

- Aspectual verbs and deontic/future modal verbs are generalized quantifiers of type  $\langle\langle\alpha,t\rangle,t\rangle$ .
- Control verbs and ability/volition modals take two arguments, and are of type  $\langle\langle s,t\rangle,\langle e,t\rangle\rangle$
- In order to guarantee successful composition, the only possible type of the trace of the latter group would be the same type, but this would fail to shift scope and violate Scope Economy.
- A prediction: if the movement of these heads is triggered not by interpretation/scope considerations, but by some syntactic feature, their movement should be allowed.

This prediction is borne out.

(45) a. Topic constructions of verbs

**Soengsi**, Aaming hai soeng **soengsi** tai ni-bun syu. control verbs  
try Aaming FOC want try read this-CL book  
'As for trying, Aaming wants to try to read this book.'

b. Right dislocation of verbs

Aaming \_\_ tai ni-bun syu gaa3 **sik**. ability modals  
Aaming read this-CL book SFP be.able  
'Aaming is able to read this book.'

(ii) epistemic modals They have a different underlying structure.

(46) The difference between epistemic and deontic modals under the proposal in Lin (2011, 2012)

- a. ... [ModP epistemic modals [finite TP **Subj.** V Obj. ] ]
- b. ... [ModP deontic/future modals [non-finite TP **Subj.** V Obj. ] ]

- The (post-modal) subject in (46a) is in a Case position, and it can stay there without further movement.
- This is different from deontic modals (or other raising predicates), where the subject is in a non-finite clause in (46b). It needs to move for Case.
- For cases where the epistemic modals follow the subject, this can be derived via an optional movement of the subject over the epistemic modal, e.g., triggered by an EPP feature (Lin 2011), or a topic feature (Chou 2013; Tsai 2015).

## 4.3 Discussions and implications

### ① Semantic effects of head movement

- Two types of semantic effects: quantificational scope and focus scope
- The lack of semantic effects is not a general property of head movement.
- The proposal applies generally to quantificational heads (unless independently ruled out).
- Among the quantificational heads discussed in the literature (i.e., determiners, negation, modal verbs, and aspectual verbs), the proposed movement applies to the last two types.
- Movement of the other two types are not observed: Cantonese lacks determiner in the first place. Also, the pre-verbal negation *m-* is prefixal, i.e., it is a bound morpheme (Yip 1988).

② A parallel observation with phrasal movement

Some adverbs exhibit a similar distribution as quantificational heads.

(47) “Non-movable” post-subject adverbs

- a. Aaming **jau** haau-dou hou singzik  
Aaming again get-able good result  
'Aaming gets good results again.'
- b. ??**Jau** Aaming haau-dou hou singzik.  
again Aaming get-able good result  
'Aaming gets good results again.'

(48) The adverb *jau* 'again' and the high position

- a. Dak jat-go jan **jau** haau-dou hou singzik.  
only one-CL person again get-able good result  
'Only one person got good results again.'
- b. **Jau** dak jat-go jan haau-dou hou singzik.  
again only one-CL person get-able good result  
'It is again the case that only one person got good results.'

- Their distribution follows from the proposed movement approach, which is also constrained by Scope Economy.
- If adverbs are phrases (as commonly assumed), then the proposed movement can be generalized to apply to both heads and phrases.
- Also, Scope Economy, as an interface condition on interpretation, does not seem to discriminate head movement from phrasal movement.
  - phrasal movement: QR in English
  - head movement: determiner movement in Japanese (Takahashi 2002), negative auxiliary inversion in some English varieties (Matyiku 2017)

## 5 Linearization: doubling effects of heads and phrases

The leading question: What conditions the double pronunciation of a movement chain?

- Doubling effects on verbs are commonplace (e.g. in predicate cleft constructions).
- Some suggest to connect doubling effects to head movement (e.g. Nunes [1995](#), [2004](#)).
- However, doubling effects on phrasal elements are not impossible.
- Focusing on topic constructions and right dislocation in Cantonese, I describe asymmetries in doubling w.r.t. heads and phrases.
- I develop a linearization account that does not distinguish head movement from phrasal movement, while delivering their doubling pattern.



## 5.1 Summary of the observations

	Subject	Verb	Object
Topic constructions	prohibited	obligatory	prohibited
Right dislocation	optional	optional	prohibited

Table 8: Doubling asymmetries in Cantonese

(i) The doubling pattern in topic constructions

(49) Topic constructions

- a. **Aaming** (ne), (??**Aaming**) soeng sik ni-tiu jyu. subjects → prohibited  
Aaming TOP Aaming want eat this-CL fish  
'As for Aaming, (he) wants to eat this fish.'
- b. **Soeng**, Aaming hai \*(**soeng**) sik jyu ge2. verbs → obligatory  
want Aaming COP want eat fish SFP  
'As for (whether he) wants, Aaming wants to eat fish (but...).'
- c. **Ni-tiu jyu**, Aaming soeng sik (??**ni-tiu jyu**). objects → prohibited  
this-CL fish, Aaming want eat this-CL fish  
'This fish, Aaming wants to eat.'

(ii) The doubling pattern in right dislocation

(50) Right dislocation

- a. (**Aaming**) soeng sik ni-tiu jyu aa3 **Aaming**. subjects → optional  
Aaming want eat this-CL fish SFP Aaming  
'Aaming wants to eat this fish.'
- b. Aaming (**sik**) ni-di je aa4 **sik?** verbs → optional  
Aaming eat this-CL thing Q eat  
'Aaming eats this thing?'
- c. Aaming sik (??**ni-di je**) aa4 **ni-di je?** objects → prohibited  
Aaming eat this-CL thing Q this-CL thing  
'Aaming EATS this thing?'

## 5.2 Proposal: Cyclic Linearization and Copy Deletion Suspension

❶ Following Fox and Pesetsky (2005), in each domain where all (necessary) syntactic operations are applied and the structure is ready to be linearized (e.g.  $\nu$ P and CP), it is *Spelled-Out*.

(51) A copy-theoretic implementation of CL (Fox and Pesetsky 2005)

At each Spell-Out domain, two independent operations apply one after the other:

- a. **Copy Deletion** (CD, typically deleting the low copies), followed by
- b. **Linearization** (LIN, establishing Ordering Statements).
- c. (Ordering Statements must be preserved by overt elements in the final output.)

Some illustrations:

(52) Scenario 1 (LIN<sub>D</sub> → Move<sub>X</sub> → CD → LIN<sub>D'</sub>)

[D' ... X α [D X Y Z ]]  
↑

OS<sub>D'</sub>: X < α < D<sub>(X < Y < Z)</sub>

(53) Scenario 2 (LIN<sub>D</sub> → Move<sub>Y</sub> → CD → LIN<sub>D'</sub>)

\* [D' ... Y α [D X Y Z ]]  
↑

\*OS<sub>D'</sub>: Y < α < D<sub>(X < Y < Z)</sub>

(54) Scenario 3 (Move<sub>Y</sub> within D → CD → LIN<sub>D</sub> → Move<sub>Y</sub> → CD → LIN<sub>D'</sub>)

[D' ... Y α [D Y X Y Z ]]  
↑    ↑

OS<sub>D'</sub>: Y < α < D<sub>(Y < X < Z)</sub>

## ② Copy Deletion suspension

### (55) Copy Deletion suspension

Copy Deletion is suspended *as a last resort* if its application violates linearization requirements imposed by CL.

The doubling effect arises as a result of the suspension of CD.

### (56) Scenario 5 ( $LIN_D \rightarrow Move_{non-edge} \rightarrow$ **CD suspension** $\rightarrow LIN$ )

$[_{D'} \dots \mathbf{Y} \alpha [_{D} X \mathbf{Y} Z ]]$   
↑

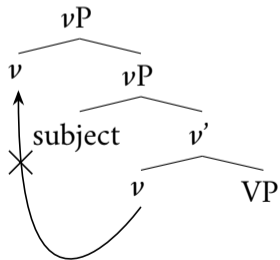
$OS_{D'}: Y < \alpha < D_{(X < Y < Z)}$

When D is Spelled-Out, the OS:  $X > Y$  is satisfied by the pronunciation of the lower copy of Y. At the later Spell-Out of D', the OS:  $Y > X$  is also satisfied by virtue of the higher copy of Y.

### 5.3 Deriving the asymmetries in doubling

I assume that a head cannot move into its own specifier, due to the lack of motivation: a head need not move to its own specifier to check feature.

(57) Illicit  $v$ -movement



### 5.3.1 Licit and illicit cases in topic constructions

#### Obligatory verb doubling

#### (58) Derivation of verb doubling

- a. Building of  $\nu$ P (headed by *soeng* ‘want’)

[ $\nu$ P Aaming hai soeng sik jyu ]

- b. Spell-Out of  $\nu$ P (CD does not apply or applies vacuously)

(CD)  $\rightarrow$  LIN $_{\nu$ P}; OS $_{\nu$ P}: **Aaming** < **hai** < soeng < **sik** < **jyu**

- c. Verb movement for topicalization

[ $_{\text{TopicP}}$  soeng ... [ $\nu$ P Aaming hai soeng sik jyu ]]



- d. Spell-Out of TopicP

CD suspension  $\rightarrow$  LIN $_{\text{TopicP}}$ ;

OS $_{\text{TopicP}}$ : soeng < **Aaming** < **hai** < soeng < **sik** < **jyu**



**Prohibited** subject and object doubling

(59) The schematic derivation of object topicalization

$[_{\text{TopP}} \text{O} \dots [_{\text{vP}} \text{O} \text{S} \text{V} \text{O} ]]$       Object movement  $\rightarrow$  CD  $\rightarrow$   $\text{LIN}_{\text{TopP}}$ ;  $\text{OS}_{\text{TopP}}$ :  $\text{O} < \text{S} < \text{V}$

(60) The schematic derivation of subject topicalization

$[_{\text{TopP}} \text{S} \dots [_{\text{vP}} \text{S} \text{V} \text{O} ]]$       Subject movement  $\rightarrow$  CD  $\rightarrow$   $\text{LIN}_{\text{TopP}}$ ;  $\text{OS}_{\text{TopP}}$ :  $\text{S} < \text{V} < \text{O}$

(The last resort nature of Copy Deletion Suspension is relevant here.)

### 5.3.2 Licit, illicit and optional cases in right dislocation

#### Licit doubling of verbs

(61) Verb doubling allowed in the presence of objects

a. Keoi **sik** ni-di je aa4 **sik**?  
he eat this-CL thing Q eat  
'He EATS this thing?'

b. ??Keoi **sik** aa4 **sik**?  
he eat Q eat  
Intended: 'He EATS?'

(62) The schematic derivation of (61)

[<sub>vP</sub> S V O ] SFP V  
└──────────┘ ↑

OS<sub>vP</sub>: S < V < O

**Licit** doubling of subjects

(63) Subject doubling in right dislocation

**Aaming** soeng sik ni-tiu jyu aa3 **Aaming**.

Aaming want eat this-CL fish SFP Aaming

'AAMING wants to eat this fish.'

(64) The schematic derivation of (63)

[<sub>vP</sub> S V O ] SFP S



OS<sub>vP</sub>: S < V < O

**Illicit** doubling of objects

(65) a. No doubling in right dislocation of objects

Aaming sik (??**ni-di je**) aa4 **ni-di je** =(50c)

Aaming eat this-CL thing Q this-CL thing

'Aaming EATS this thing?'

b. The schematic structure of (65a)

$[_{vP} S V \text{O}]_{SFP} O$   


$OS_{vP}: S < V < O$

**Licit** doubling of objects

(66) a. Duration phrases

Aaming tai-zo      **ni-bun syu**    saam-go zong laa3 **ni-bun syu**.  
Aaming read-PERF this-CL book three-CL hour SFP this-CL book  
'Aaming has read THIS BOOK for three hours.'

b. Indirect object

Aaming bei-zo      **ni-bun syu**    Aafan laa3 **ni-bun syu**.  
Aaming give-PERF this-CL book Aafan SFP this-CL book  
'Aaming has given THIS BOOK to Aafan.'

(67) The schematic structure of sentences in (66)

[<sub>vP</sub> S V O 3-hours/Aafan ] SFP O  
└──────────────────────────┘ ↑

OS<sub>vP</sub>: S < V < O < 3-hours/Aafan

## Optional doubling of verbs

→ Independent movement operations re-arrange the elements in the  $\nu$ P before Spell-Out

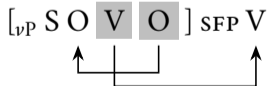
(68) a. No doubling in right dislocation of verbs

Keoi ni-di je aa4 sik<sub>i</sub>?

he this-CL thing Q eat

'He eats THIS THING?'

b. The schematic derivation of (68a)



**Object movement** → CD →  $\text{LIN}_{\nu\text{P}}$ ;  $\text{OS}_{\nu\text{P}}$ :  $\text{S} < \text{O} < \text{V}$

Independent evidence for object movement:

First, it is not parasitic on right dislocation and can be applied independently.

- (69) Keoi [**ni-di je**]<sub>i</sub> sik t<sub>i</sub> gaa4?  
he this-CL thing eat Q  
'He eats THIS THING?'

Second, if the nominal in the object position cannot undergo object movement (e.g. bare noun indefinites) as in (70a), the verb cannot be right dislocated either as in (70b).

- (70) a. \*Aaming **je**<sub>i</sub> sik t<sub>i</sub> aa4?  
Aaming thing eat Q  
Int.: 'Aaming eats?'
- b. \*Aaming je t<sub>i</sub> aa4 **sik**<sub>i</sub>?  
Aaming thing Q eat  
Int.: 'Aaming eats?'

**Optional** doubling of subjects

→ Again, independent movement operations re-arrange the elements in the  $\nu P$  before Spell-Out

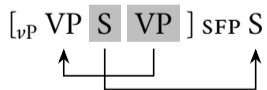
(71) No doubling in right dislocation of subjects

Soeng sik ni-tiu jyu aa3 **Aaming**.

want eat this-CL fish SFP Aaming

‘Aaming wants to eat this fish.’

(72) The schematic derivation of RD of subjects



**VP movement** → CD →  $LIN_{\nu P}$ ;  $OS_{\nu P}$ : VP < S



Independent evidence for VP movement:

First, VPs can move independently of right dislocation.

(73) [Sik ni-tiu jyu]<sub>i</sub>, Aaming soeng t<sub>i</sub> aa3.

eat this-CL fish Aaming want SFP

(Lit.) 'To eat this fish, Aaming wants.'

Second, the VP in (71) receives focus interpretation, a discourse effect that is discussed in Cheung (2009). If the subject is doubled, then it is the subject that receives the (contrastive) focus interpretation, instead of the VP.

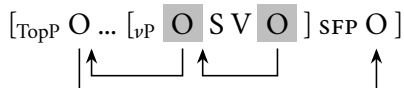
### 5.3.3 Resolving a further asymmetry in doubling

Left-dislocated topics vs. base-generated topics:

(74) Left-dislocated topics in right dislocation

**Ni-di je** Aaming sik aa4 **ni-di je**.  
 this-CL thing Aaming eat Q this-CL thing  
 ‘Aaming eats THIS THING?’

(75) The schematic derivation of (74)

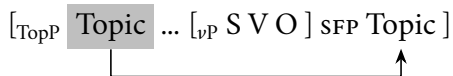


Obj. move. → CD → LIN<sub>vP</sub>; OS<sub>vP</sub>: O < S < V

(76) Base generated topics in right dislocation

(??**Seoigwo**) Aaming zungji lei aa3 **seoigwo**.  
 fruit Aaming like pear SFP fruit  
 ‘As for fruits, Aaming likes pears.’

(77) The schematic derivation of (76)



OS<sub>vP</sub>: S < V < O

## 5.4 Extension: verb movement without doubling

An apparent challenge to the proposal:

(78) Verb movement without doubling

- a. **Hittade** han faktist (\*hittade) pengarna under sängen? Swedish  
found he actually found money.the under bed.the  
'Did he actually find the money under the bed?' (Takita 2010, p.40, with adaptations)
- b. **Razkazvala** beše često Marija (\*razkazvala) тази istorija Bulgarian  
told was often Maria told this story  
'Maria had often told this story.' (Harizanov 2019, p.8, with adaptations)

(79) Spell-Out Domain Parameter for  $\nu$ P (Takita 2010)

When Spell-Out applies to  $\nu$ P,

- a. Linearize the whole  $\nu$ P, including the elements on its edge, or
- b. Linearize the complement of  $\nu$ .

(80) The derivation of (78a)

a. [<sub>CP</sub> **Hittade** [<sub>TP</sub> han faktist [ <sub>$\nu$ P</sub> han [<sub>VP</sub> hittade pengarna under sängen? ]]]

b. LIN<sub>VP</sub>; OS<sub>VP</sub>: V < O < PP

(81) Verb doubling possibility

- a. Languages that allow verb doubling take the value of (79a); e.g. Cantonese
- b. Languages that disallow verb doubling take the value of (79b). e.g. Swedish, Bulgarian

(82) Remnant movement possibility (Takita 2010)

- a. Languages that disallow remnant movement take the value of (79a); e.g. Japanese
- b. Languages that allow remnant movement take the value of (79b). e.g. German, English

(83) Predicted distribution of verb doubling and remnant movement

- a. Languages that allow verb doubling will disallow remnant movement.
- b. Languages that allow remnant movement will disallow verb doubling.

(83a) is borne out by the unavailability of remnant  $\nu$ P movement in Cantonese.

(84)  $\nu$ P fronting in Cantonese

- a. \* $[_{\nu P} t_i \text{ bin } \quad \text{hak } ]_j$  , go tin<sub>i</sub> hoici t<sub>j</sub> laa3.  
become dark CL sky begin SFP

Raising

Intended: 'To become dark, the sky begins.'

- b.  $[_{\nu P} \text{ PRO } \text{pau } \text{coengpau } ]_i$ , keoi soengsi-gwo t<sub>i</sub> laa3.  
run long.run keoi try-EXP SFP

Control

'To run long distance, he tried.'

(83b) is borne out in English.

(85) Verb doubling in English

- \***Criticize(d)**, John **criticized** his boss.

(86) Some more predictions

- a. Languages that disallows verb doubling will allow remnant movement.
- b. Languages that disallows remnant movement will allow verb doubling.

(87) Remnant movement in Swedish (Fox and Pesetsky 2005, p.25)

?[Gett henne  $t_i$ ] har jag den<sub>i</sub> inte ...  
given her have I it not  
'I have not given it to her.'

(88) Verb doubling in Japanese?

John-ga computer-o **kai**-wa **si**-ta  
John-NOM computer-ACC buy-CON do-PST  
'Indeed, John bought a computer, (but...)'

(89) Verb doubling in Korean?

John-i computer-lul **sa**-ki-nun **sa**-ss-ta  
John-NOM computer-ACC buy-KI-CON buy-PAST-DECL  
'Indeed, John bought a computer, (but...)'

The correspondence between verb doubling and remnant movement:

Parameter	(79a) Linearize $vP$			(79b) Linearize VP		
Language	Cantonese	Japanese	Korean	Swedish	English	German
Verb doubling	Yes	?	?	No	No	No
Remnant movement	No	No	No	Yes	Yes	Yes

Table 9: Verb doubling and remnant movement across languages



## 6 Conclusions

- I explored the possibility of a unified theory of movement that does not make reference to structural types such as heads and phrases.
- I discussed three pieces of evidence from Cantonese, showing that movement of heads and phrases are subject to the same set of syntactic principles, which constrain
  - (i) how they move in the syntax,
  - (ii) how they contribute to interpretation, and
  - (iii) how their chains are phonologically realized.
- To the extent that head movement can be assimilated to phrasal movement, this thesis sets the basis of a movement theory that does not discriminate heads from phrases.

## Implications:

- The proposal allows us to maintain the formulation of the structure-building operation, *Merge*, in its simplest form.
- Internal Merge applies to constituents without the need to distinguish heads from phrases, in a way comparable to External Merge.
- It also opens up questions of whether and how other reported differences between movement of heads and phrases can be attributed to components of the grammar other than the movement mechanism.

Further issues:

- Focus Intervention Effects in other predicate cleft constructions
- The fine structure of left and right periphery (i.e., Defocus > Topic > Focus)
- The nature of scope-shifting operations and Scope Economy
- The trigger and landing site of head movement
- Ways to doubling effects

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