

# Movement of quantificational heads

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## Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
<b>2</b>	<b>The distribution of aspectual and modal verbs in Cantonese</b>	<b>3</b>
2.1	The pre-subject position . . . . .	3
2.2	Quantificational elements and the high position . . . . .	4
<b>3</b>	<b>A head movement account</b>	<b>6</b>
3.1	Head movement constrained by Scope Economy . . . . .	6
3.2	The landing site . . . . .	7
3.3	The trigger of the movement . . . . .	9
<b>4</b>	<b>Compositional issues</b>	<b>10</b>
4.1	Heads that are generalized quantifiers . . . . .	11
4.2	Semantic types matter . . . . .	12
<b>5</b>	<b>Predictions and cross-linguistic variations</b>	<b>13</b>
5.1	More on heads of modifier types . . . . .	13
5.2	More on the syntactic trigger . . . . .	15
<b>6</b>	<b>Concluding remarks</b>	<b>16</b>

## 1 Introduction

The general theme of today: the role of the head-phrase distinction in movement theories

- Head Movement (HM) is often said to lack semantic effects.
- HM thus appears to be substantially different from phrasal movement.
- This raises non-trivial concerns on the theoretical status of HM in movement theories.

Efforts have been made to maintain a unified theory of movement.

- Dispelling HM from Narrow Syntax:

❶ HM occurs in the phonological/PF component

(Chomsky 2001; Boeckx and Stjepanović 2001; Schoorlemmer and Temmerman 2012; Zwart 2017)

❷ “HM” is indeed remnant phrasal movement, so there is no HM at all

(Koopman and Szabolcsi 2000; Massam 2000; Rackowski and Travis 2000; Mahajan 2003; Müller 2004, among many others)

(These efforts are also partly motivated by the theoretical concerns surrounding HM (see, e.g. Fanselow 2003; Donati 2006; Matushansky 2006; Surányi 2008; Roberts 2011; Dékány 2018, for overviews).

However, the growing body of evidence for the semantic effects (particularly scope effects) of HM suggests the opposite.

- HM *can* have semantic effects

(Benedicto 1998; Takahashi 2002; Han, Lidz, and Musolino 2007; Lechner 2007; Szabolcsi 2010, 2011; Iatridou and Zeijlstra 2013; Keine and Bhatt 2016; Matyiku 2017; Sato and Maeda 2020)

- But the reported evidence is not uncontroversial and may have alternative analyses

(Shimoyama 2006; Richter and Sailer 2008; Hall 2015; McCloskey 2016; Zeijlstra 2017; Harizanov and Gribanova 2019)

See Appendix A for the debate.

The goals for today: to present a novel piece of evidence for HM with semantic effects from Cantonese

- I show that quantificational heads such as aspectual verbs and modal verbs in Cantonese can undergo (overt) HM that shifts scope
- I further show that the proposed HM interacts with an independently motivated condition on interpretation: its application is constrained by Scope Economy (Fox 2000).

Some implications of this study:

- The findings further confirm the syntactic status of HM

(Toyoshima 2001; Matushansky 2006; Vicente 2007; Dikken 2006; Baker 2009; Gallego 2010; Roberts 2010; Hartman 2011; Funakoshi 2014; Jenks 2014; Gribanova 2017, in addition to references cited above).

- The observation that HM can impose semantic effects eliminates one of the alleged differences between HM and phrasal movement

(contra Chomsky 2001; Schoorlemmer and Temmerman 2012; Hall 2015; McCloskey 2016)

- Scope Economy applies not only to phrasal movement but also HM, in support of the claim that the computational system does not discriminate HM from phrasal movement

(Vicente 2007; Hartman 2011; Funakoshi 2014; Harizanov 2019; Pesetsky 2020)

Roadmap: §2 The data; §3 Head movement; §4 Composition; §5 Predictions

## 2 The distribution of aspectual and modal verbs in Cantonese

### 2.1 The pre-subject position

Aspectual verbs like *hoici* ‘begin’ canonically appear after the subject.

- (1) 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

If the subject is quantificational, *hoici* ‘begin’ can appear in the initial position.

- (2) 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.’

Sentences in (2a) and (2b) are truth-conditionally distinct.

Who is getting good results...			
Scenario 1		Scenario 2	
Test 1	Test 2	Test 1	Test 2
Aaming: 40	Aaming: 100	Aaming: 100	Aaming: 100
Bill: 40	Bill: 40	Bill: 40	Bill: 40
Chris: 100	Chris: 100	Chris: 100	Chris: 40
→ (2a) only Aaming > begin		→ (2b) begin > only Aaming	

The same pattern is also observed with other aspectual verbs and deontic modals.

#### (3) The aspectual verb *gaizuk* ‘continue’

- a. ngo tenggong [(dak) Hoenggong **gaizuk** paai tau sapwai]  
 I hear only Hong.Kong continue rank initial tenth  
 ‘I heard that (only) HK is such that she continues to rank among the first tenth.’
- b. ngo tenggon [**gaizuk** \*(dak) Hoenggong \_\_ paai tau sapwai]  
 I hear continue only Hong.Kong rank initial tenth  
 Int.: ‘I heard that it continues to be the case that (only) HK ranks among the first tenth.’

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

- a. ngo deoi [(dak) Aaming **hoji/ wui** zou fan] mou jigin  
I to only Aaming may/ will early sleep not.have opinion  
‘I have no opinion on (the claim that) (only) Aaming may/will sleep early.’
- b. ngo deoi [**hoji/ wui** \*(dak) Aaming zou fan] mou jigin  
I to 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.’

(Note: Epistemic modals can freely appear in pre-/post-subject positions, see §4.)

However, the pattern is not observed with control verbs and dynamic modals, i.e. they cannot appear sentence-initially.

(5) Control verbs: *soengsi* ‘try’ and *kyutding* ‘decide’

- a. (dak) Aaming { **soengsi/ kyutding** } tai ni-bun syu  
only Aaming try/ decide read this-CL book  
‘Only Aaming tries to/ decides to read this book.’
- b. \*{ **soengsi/ kyutding** } (dak) Aaming tai ni-bun syu  
try/ decide only Aaming read this-CL book

(6) Dynamic modals: *nanggaau* ‘be.able’ and *gaam* ‘dare’

- a. (dak) Aaming { **sik/ gaam** } tai ni-bun syu  
only Aaming be.able/ dare read this-CL book  
‘Only Aaming is able/ dare to read this book.’
- b. \*{ **sik/ gaam** } (dak) Aaming tai ni-bun syu  
be.able/ dare only Aaming read this-CL book

## 2.2 Quantificational elements and the high position

The licensing condition on the ‘high’ position:

- Whether these verbs can occupy a high position is contingent on the nature of the constituent that immediately follow this position.
- Precisely, the high position is licensed if the relevant constituent is *quantificational*.
- This constituent may take various syntactic forms, ranging from nominal subjects and topics to adverbials and subordinate clauses.

(7) The high position is licensed by the following quantificational element

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

(i) Minimal pairs with (non-)quantificational **subjects**:

- (8) Existential quantifiers vs. pronouns in the subject position (a. 'begin' > some)

**hoici** [<sub>SUBJ</sub> a. <sup>OK</sup>jau jan/ b. \*keoi ] \_\_ haau-dou hou singzik  
 begin have person he get-able good result  
 'It begins to be the case that someone/ he is getting good results.'

(ii) Minimal pairs with (non-)quantificational **topics**:

- (9) Universal quantifiers vs. definite NPs in the topic position (a. 'begin' > every)

**hoici** [<sub>TOP</sub> a. <sup>OK</sup>cyunbou jan/ b. \*ni-go jan ] Aaming (dou) \_\_ hou jansoeng  
 begin every person this-CL person Aaming all very praise  
 'It begins to be the case that Aaming praises everyone/ this person.'

(iii) Minimal pairs with (non-)quantificational **adverbs**:

- (10) Quantificational vs. non-quantificational adverbs (a. 'begin' > every)

**hoici** [<sub>ADV</sub> a. <sup>OK</sup>hai mui-gaan hokhaau/ b. \*hai ngodei hokhaau ] Aaming (dou) \_\_ haau-dou  
 begin at every-CL school at our school Aaming all get-able  
 hou singzik  
 good result  
 'It begins to be the case that, at every/ our school(s), Aaming is getting good results.'

(iv) Minimal pairs with (non-)quantificational **subordinate clauses**:

- (11) 'Whenever'-clauses vs. 'although'-clauses

- a. **hoici** [<sub>CP</sub> faanhai daa-fung] hoimin dou \_\_ wui jau daailong  
 begin whenever approach-typhoon sea all will have big.waves  
 'It begins to be the case that whenever typhoons approach, there'll be big waves on the sea.'  
*cf.* the low reading: 'Whenever typhoons approach, there begin to be big waves on the sea.'
- b. \***hoici** [<sub>CP</sub> seijin mou daa-fung] hoimin dou \_\_ jau daailong  
 begin although not approach-typhoon sea all have big.waves  
*cf.* the low reading: 'Although there is no typhoon, there begin to be big waves on the sea.'

If there is more than one quantificational element in the sentence, there are multiple possible landing sites for *hoici*.

- (12) Quantificational adverbs and subjects (a. 'begin' > 'every' > 'most' / b. 'every' > 'begin' > 'most')

- a. **hoici** [<sub>ADV</sub> hai mui-gaan hokhaau ] b. **hoici** [<sub>SUBJ</sub> daaiboufan jan ] dou \_\_ haau-dou hou  
 begin at every-CL- school begin most person all get-able good  
 singzik  
 result  
 a. 'It begins to be the case that, at every school, most people are getting good results.'  
 b. 'At every school, it begins to be the case that most people are getting good results.'

The generalization:

- (13) A high position of aspectual verbs and deontic/future modals is licensed if the constituent that immediately follows this position is quantificational.

### 3 A head movement account

An overview of the proposal:

- an instance of syntactic head movement that
  - (i) is constrained by Scope Economy;
  - (ii) lands at an adjoined position to a phrase (or reprojects there) and;
  - (iii) is non-feature-driven.


A working assumption: aspectual verbs and deontic/future modals can be used as a *raising* predicate (for the former, see Perlmutter 1968, 1970; Li 1990; for the latter, see Lin and Tang 1995; Bhatt 1998; Wurmbrand 1999)

- (14) The basic structure of sentences with aspectual verbs and deontic/future modals  
 $[_{TP} \text{ subject}_i \text{ Asp./Mod. } [_{vP} t_i \text{ verb object } ]]$

#### 3.1 Head movement constrained by Scope Economy

- (15) 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.’

First, I propose that (15b) is derived from (15a), where *hoici* ‘begin’ moves to a position c-commanding the subject and takes scope over ‘only’.

- (16) Deriving (15b) from (15a) under a HM approach  
 $\text{begin } [_{TP} \text{ only Aaming}_i \text{ } \_ \text{ } [_{vP} t_i \text{ get-good-result } ]]$  *scope enrichment*  


Secondly, and importantly, I propose that the movement fails to apply if it violates Scope Economy. (Fox 2000).

- (17) Scope Economy (Fox 2000)  
 [Scope-shifting operations] that are not forced by type consideration must have a semantic effect.

Since the subject is non-quantificational in (1b), i.e. a proper name, movement of *hoici* ‘begin’ fails to shift scope relations.

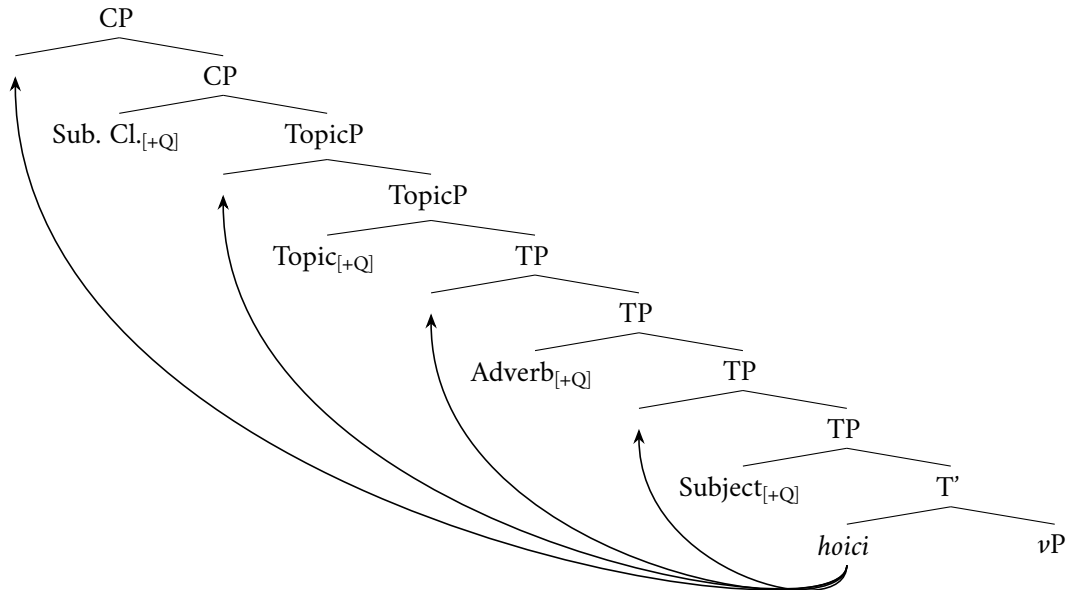
(18) Attempted derivation of (1b) from (1a) under a HM approach

begin [TP Aaming<sub>i</sub> \_\_\_ [vP t<sub>i</sub> get-good-result ]]

*vacuous movement*

An immediate consequence: it derives the generalization in (13).

(19) A graphic representation of the proposed HM



A prediction: the movement of one quantificational head would license the movement of another quantificational head.

(20) Stacking aspectual verbs and deontic modals

- a. dak Aaming **hoici hoji** zou fan (‘only’ > ‘begin’ > ‘may’)  
 only Aaming begin may early sleep  
 ‘Aaming begins to be allowed to sleep early.’
- b. **hoici hoji** dak Aaming \_\_\_ \_\_\_ zou fan (‘begin’ > ‘may’ > ‘only’)  
 begin may only Aaming early sleep  
 ‘It begins to be the case that it is allowed that only Aaming sleeps early.’

(21) A two-step derivation of (20b)

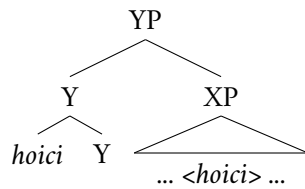
begin may [TP only Aaming<sub>i</sub> \_\_\_ \_\_\_ [vP t<sub>i</sub> sleep-early ]]

(For alternatives to a head movement account, see Appendix B.)

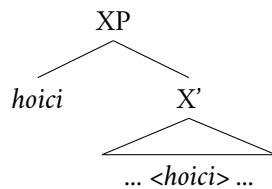
### 3.2 The landing site

There are (at least) four possibilities for the landing site of the proposed head movement.

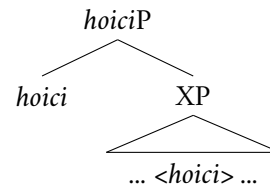
(22) a. A head-adjoined position



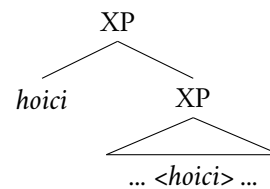
b. A specifier position



c. A derived head position



d. A phrase-adjoined position



I argue that the last option is empirically and conceptually superior.

**The head-head adjunction approach** (Baker 1985, *et seq.*) in (22a):

- *Hoici* 'begin' does not c-command the quantificational element. The scope significance might need to rely on some non-standard definition of c-command.
- We must posit various null heads like Y along the clausal spine, which would have to spread over every projection in the higher clause.

**The specifier approach** (Toyoshima 2001; Matushansky 2006; Vicente 2007; Harizanov 2019) in (22b):

- Since *hoici* 'begin' can cross quantificational elements of different types, it does not target a specifier position of a particular (functional) projection (e.g. FocusP or TopicP).
- The example in (12) further shows that it can target multiple positions in the same sentence.
- It is unclear what would be the triggering feature

**The reprojection** (Fanselow 2003; Donati 2006; Surányi 2008; Georgi and Müller 2010; Cecchetto and Donati 2015) in (22c)

- It suffers from similar issues with regard to the trigger.
- The stacking example in (20) shows that the higher aspectual verbs do not block the lower modal verbs from moving first, suggesting that the movement is not triggered by categorial features on some higher head (cf. Fanselow 2003; Surányi 2008).

I suggest that the **head-phrase adjunction** in (22d) encodes enough flexibility to the proposed HM. By taking a moving head as an adjunct,

- it takes care of the scope facts and multiple landing sites of the moving head
- there is no need to worry about the null heads or triggers.



An empirical argument: notice that Scope Economy is agnostic on the precise range of landing sites.

(23) A configuration showing possible landing sites under Scope Economy

② [TP Adverbial<sub>[-Q]</sub> ① [TP Subject<sub>[+Q]</sub> **Asp./Mod.** [<sub>vP</sub> ... ] ] ]

However, ② is indeed impossible.

(24) A non-quantificational adverbial and a quantificational subject ('begin' > 'most')

② \*hoici [<sub>ADV</sub> hai ngodei hokhaau ] ① hoici [<sub>SUBJ</sub> daaiboufan jan ] dou \_\_\_ haau-dou hou  
 begin at our school begin most person all get-able good  
 singzik  
 result

'At our school, it begins to be the case that,most people are getting good results.'

The intuition is that the movement of *hoici* cannot "wait".

If we assume that the head is in fact an adjunct, the observation follows from an independently motivated constraint on adjuncts (cf. the placement of focus particles in Vietnamese):

(25) Adjoin As Soon As Possible (Erlewine 2017, p.342)

Adjuncts should be adjoined as soon as they will be interpretable.

The contrast in (24) remains puzzling for the other three alternatives.

Some conceptual arguments:

- A null hypothesis on the adjunction site should be that it can target either heads or phrases.
- The proposed HM illustrates the possibility of *Internal Pair-Merge*, where adjunction is resulted from movement. This mode of structure building is argued to exist in Richards (2009) for phrasal movement.

### 3.3 The trigger of the movement

As for the trigger of the movement, there are a few possibilities.

- triggered by some A'-feature in the CP periphery (cf. Beghelli and Stowell 1997)
- triggered by the edge feature on phase heads (Chomsky 2008; Richards 2009; Miyagawa 2011)
- Non-feature-driven (Chomsky 1995; Syed and Simpson 2020), but for interpretive effects (Fox 2000; Bobaljik and Wurmbrand 2012)

I argue for the last option.

Concerns over a feature-driven approach:

- It is unlikely to be triggered by discourse features, since the 'begin'-initial sentences are felicitous in out-of-the-blue and 'what happened?' contexts.
- It is unlikely to be triggered by the edge feature, since the landing site can be a non-edge position, e.g. various positions in the CP domain.

I suggest that movement is in fact not driven by syntactic features, but by scope considerations, in a way similar to Quantifier Raising.

- The evidence comes from the obligatory absence of reconstruction of the proposed movement
  - Feature-driven movements can optionally reconstruct, or at least reconstruction is not consistently disallowed.
  - In contrast, if movements triggered purely for scope reasons reconstruct, it would neutralize the scope effects, which would unavoidably violate Scope Economy.
  - This explains why (2b), repeated below, is unambiguous.

(26) **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.'

As a conceptual argument, I suggest that obeying Scope Economy indeed indicates the absence of a featural trigger.

- Scope Economy appears to be specific to scope-shifting operations (Fox 2000). It does not constrain feature-driven movements.
  - The dichotomy follows if we assume with Chomsky (2000, p.109) in that no syntactic operation is vacuous (see also Reinhart 1995; Fox 2000; Chomsky 2001; Miyagawa 2006, 2011).
- (27) Operations can apply only if they have an effect on the outcome.
- Thus, a movement operation must either check features or alter scope relations.
  - If a movement operation obeys Scope Economy, it indicates that, unless it alters scope relations, it cannot otherwise have an effect on the outcome.
  - Non-feature driven movement seems to be independently motivated:
    - Determiner raising in Japanese (Takahashi 2002)
    - Modal movement to derive split-scope reading (Lechner 2007)
    - PPI modals and their movement over negation (Iatridou and Zeijlstra 2013)
    - Argument scrambling within the nominal domain in Bangla (Syed and Simpson 2020)
    - Surányi (2004) discusses arguments against a feature theory of quantifier scope (Beghelli and Stowell 1997).

## 4 Compositional issues

We are left with two issues:

- How is the scope effect of the proposed HM achieved compositionally?
- What differentiates aspectual verbs and deontic modals from other verbs?

## 4.1 Heads that are generalized quantifiers

I propose that

- Aspectual verbs are generalized quantifiers over times (of type  $\langle i, t, t \rangle$ )  
Deontic/future modals are generalized quantifiers over worlds (of type  $\langle s, t, t \rangle$ )
- Crucially, their movement leaves a trace of a lower type (i.e. a time/world variable)
- The lexical semantics of *hoici* ‘begin’:

(28) The lexical entry of *hoici* ‘begin’

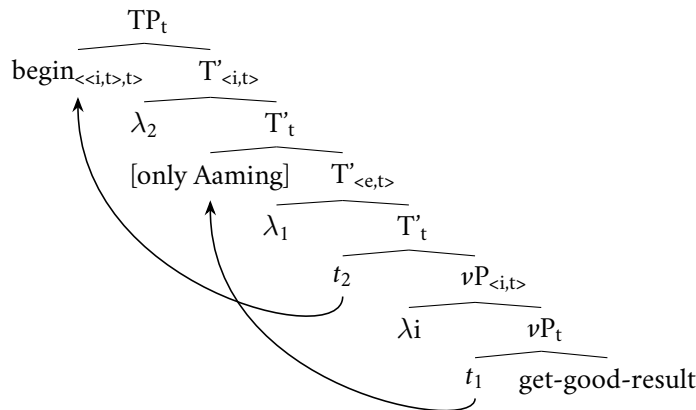
$$\llbracket \textit{hoici} \rrbracket = \lambda P_{\langle i, t, t \rangle}. \exists t' \exists t'' [ t' < t^* \leq t'' \wedge \neg P(t') \wedge P(t'') ]$$

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

A demonstration:

(29) a. **hoici** dak Aaming haau-dou hou singzik =(2b)  
begin only Aaming get-able good result  
‘It begins to be the case that only Aaming is getting good results.’

b. A compositional analysis of (2b)



c. The semantics of (29b)

$$\llbracket (29b) \rrbracket = \exists t' \exists t'' [ t' < t^* \leq t'' \wedge [ \neg \text{only Aaming } \lambda x. \text{get-good-result}(x)(t') ] \wedge [ \text{only Aaming } \lambda x. \text{get-good-result}(x)(t'') ] ]$$

Szabolcsi (2011) discusses an alternative type for aspectual verbs:

- They are of modifier type  $\langle \langle i, t \rangle, \langle i, t \rangle \rangle$ .
- Some issues arise with regard to the type of the trace:
  - An individual type, i.e. a time variable, would lead to type mismatch (cf. Lechner 2007).
  - If the trace is of the same modifier type, it would lead to semantic reconstruction (hence no scope significance).

- A possible type is  $\langle i, t \rangle$ , but traces of higher types are argued to be nonexistent. (Chierchia 1984; Landman 2006; Poole 2017)
- Solutions have been suggested to avoid the type issue, but require independent stipulations.
  - Trace-less movement or LF-deletion of trace (Cable 2010; Stepanov 2012; Matyiku 2017);
  - type-lifting of the aspectual verbs in case of movement (Matyiku 2017);
  - function composition with a type-lifted tense operator (Szabolcsi 2011)

## 4.2 Semantic types matter

What differentiates aspectual verbs and deontic modals from other verbs?

- I suggest that other verbs fail to undergo the proposed HM because of compositional conflicts.
- Control verbs and dynamic modals take two arguments, a clausal complement and an external argument (hence of type:  $\langle \langle s, t \rangle, \langle e, t \rangle \rangle$ ).
  - In case of movement, if their corresponding trace is of an individual type (e.g. an object, a time or a world), type mismatch is unavoidable.
  - Assuming that movement traces cannot be of a higher type, these heads necessarily reconstruct, violating Scope Economy.

A straightforward predication:

- These heads can move if triggered not for scope reasons, but, e.g., by discourse features. This is because the trace can be of the same type.

- (30) a. Verb doubling in topicalization (Cheng and Vicente 2013)
- soengsi**, Aaming hai soeng **soengsi** tai ni-bun syu... control verbs  
 try Aaming FOC want try read this-CL book  
 ‘As for (whether he wants to) try, Aaming wants to try to read this book..’
- b. Right dislocation of verbs (Lee 2017)
- Aaming \_\_ tai ni-bun syu gaa3 **sik** dynamic modals  
 Aaming read this-CL book SFP be.able  
 ‘Aaming is able to read this book.’

An issue with epistemic modals: they can freely appear before or after the subject, regardless the subject being quantificational or non-quantificational.

(31) Epistemic modals and the pre-subject position

- a. (dak) Aaming **honang** haau-dou hou singzik  
only Aaming be.possible get-able good results  
'(Only) Aaming is possible to get good results.'
- b. **honang** (dak) Aaming haau-dou hou singzik  
be.possible only Aaming get-able good result  
'It is possible that (only) Aaming gets good results.'

One possibility suggested in Tsai (2015) is that epistemic modals are adverbs and can have multiple base generations positions. Hence, no movement is involved at all in (31b).

This suggestion is corroborated by the distribution of sentential negation.

(32) Sentential negation and the pre-subject position

- a. (dak) Aaming **m-hai** haau-dou hou singzik  
only Aaming NOT get-able good results  
'(Only) Aaming didn't get good results.'
- b. **m-hai** (dak) Aaming haau-dou hou singzik  
NOT only Aaming get-able good result  
'It is not the case that (only) Aaming gets good results.'

Taking stock, the proposed HM applies to

- quantificational heads
- heads that do not take an external argument
- heads that do not have multiple base generation position

## 5 Predictions and cross-linguistic variations

### 5.1 More on heads of modifier types

Under the current proposal, quantificational heads of modifier types, if supplemented with the relevant mechanism handling the trace issues, are not strictly unmovable.

- These include adverbials (of type  $\langle\langle\alpha,t\rangle,\langle\alpha,t\rangle\rangle$ ) and negation (of type  $\langle t,t\rangle$ )
- Plus, they have fixed base generation position (or they would be uninformative to whether they move).

❶ Adverbials with a fixed position in Cantonese (following an early observation by Li and Thompson (1981)).

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

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

Importantly, *jau* 'again' can occupy the pre-subject position if the subject is quantificational. Notably, it takes wide scope over 'only one person' in the derived position in (34b).

(34) “Non-movable” adverbs occupying the pre-subject position

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

② Negation in West Texas English.

(35) Negative Auxiliary Inversion in West Texas English

(Matyiku 2017, p.16, 75)

- a. Everybody **didn't** go to the party.
- b. **Didn't** everybody see the fight. (not > everybody; \*everybody > not)  
'Not everybody saw the fight.'
- c. \***Didn't** Jamie see the fight.

Note that in both cases of adverbials and negation, it has to be assumed that either the movement does not leave a trace or the trace is deleted at LF (Cable 2010; Stepanov 2012; Matyiku 2017).

No such HM is attested in Standard English.

(36) Standard English

- a. **Again**, John won the race./ John **again** won the race. / John won the race **again**.
- b. \***Didn't** everybody see the fight.

Note that it is not that negation can never move. It just cannot undergo HM that is triggered by scope considerations.

- (37) a. **Don't** you come?  
b. **Never** will John come here.

## 5.2 More on the syntactic trigger

The close tie between HM and obligatory scope-shifting (or sensitivity to Scope Economy) ceases to exist if the HM has a different syntactic trigger.

❶ Cases where HM is triggered by categorial features. In German, scope effects are unavailable.

(38) German V2 movement (p.c. Stefan Keine)

- a. [CP Nur die Aktienkurse [C' **begannen**<sub>i</sub> im Mai t<sub>i</sub> zu steigen ] ]  
 only the stock.prices began in May to rise  
 'In May, only stock prices begins to rise.' (‘only’ > ‘begin’ / \*‘begin’ > ‘only’)
- b. [CP Im Mai [C' **begannen**<sub>i</sub> nur die Aktienkurse t<sub>i</sub> zu steigen ] ]  
 in May began only the stock.prices to rise  
 'In May, only stock prices begins to rise.' (‘only’ > ‘begin’ / \*‘begin’ > ‘only’)

In Dutch, scope effects are optional.

(39) Dutch V2 movement (Szabolcsi 2010, p.38, adapted)

- a. [CP Alleen Marie [C' **begon**<sub>i</sub> goede rollen t<sub>i</sub> te krijgen ] ]  
 only Mary began.3sg good roles to get.INF  
 'Only Mary is such that she began to get good roles.' (‘only’ > ‘begin’ / \*‘begin’ > ‘only’)
- b. [CP In mei [C' **begon**<sub>i</sub> alleen Marie goede rollen t<sub>i</sub> te krijgen ] ]  
 in May began.3sg only Mary good roles to get.INF  
 i. 'Only Mary is such that she began to get good roles.'  
 ii. 'It began to be the case that only Mary is getting good roles.' (‘only’ > ‘begin’ / ‘begin’ > ‘only’)


In either case, scope effects are not obligatory.

❷ Cases where HM is triggered by discourse features.


(40) Right dislocation of quantificational heads

- dak Aaming \_\_ haau-dou hou sengzik aa3 **hoici** (‘only’ > ‘begin’; ‘begin’ > ‘only’)  
 only Aaming get-able good result SFP begin  
 'Only Aaming begins to get good results.'

(41) Narrow scope ‘begin’

[only Aaming t<sub><i,t></sub>,t>> ... ] begin  


(42) Wide scope ‘begin’

[ t<sub><i,t></sub>,t>> only Aaming t<sub><i></sub> ... ] begin  


While HM triggered by scope reasons entails obligatorily scope effects, other instances of HM display a wide range of possibilities with regard to the availability of scope effects.

## 6 Concluding remarks

(Repeated from above) Some implications of this study:

- The findings further confirm the syntactic status of HM  
(Toyoshima 2001; Matushansky 2006; Vicente 2007; Dikken 2006; Baker 2009; Gallego 2010; Roberts 2010; Hartman 2011; Funakoshi 2014; Jenks 2014; Griбанова 2017, in addition to references cited above).
- The observation that HM can impose semantic effects eliminates one of the alleged differences between HM and phrasal movement  
(contra Chomsky 2001; Schoorlemmer and Temmerman 2012; Hall 2015; McCloskey 2016)
- Scope Economy applies not only to phrasal movement but also HM, in support of the claim that the computational system does not discriminate HM from phrasal movement  
(Vicente 2007; Hartman 2011; Funakoshi 2014; Harizanov 2019; Pesetsky 2020)

The head/phrase distinction is

- important in the explanation of the endocentric property
- but not as significant in theorizing the displacement property

The postulation of two non-overlapping, non-competing operations, i.e. HM and phrasal movement

- appears to be “a remnant of a ‘construction-driven’ approach to syntax” (Donati 2006, p.21)
- arouses various theoretical concerns and empirical puzzles.

To the extent that HM and phrasal movement are both results of the same operation *Merge*, the long-observed differences between them may in fact be attributed not to the mode of structure building but to other components in the grammar.



## Appendix A: The debate on semantic effects of HM

Evidence suggesting that at least some instances of HM should retain a syntactic status:

- (43) a. HM imposes syntactic effects  
e.g. it licenses NPI (Roberts 2010; Matsui 2007); it reformulates/voids opaque syntactic domains (Dikken 2006; Gallego 2010; Stepanov 2012)
- b. HM applies before another syntactic operation/before transfer to LF  
e.g. it precedes VP-fronting (Wiland 2008; Funakoshi 2014, 2019); it feeds LF interpretation (Hartman 2011; Gribanova 2017)
- c. HM imposes semantic effects  
(i) *Discourse effects*: e.g. it topicalize/focalize the verbs (Vicente 2007; Cheng and Vicente 2013; Harizanov and Gribanova 2019, among others); it imposes illocutionary effects (Wechsler 1991; Truckenbrodt 2006)  
(ii) *Scope effects*: it shifts scope relations (Lechner 2007; Szabolcsi 2010; 2011; Iatridou and Zeijlstra 2013, among others)

The discourse/illocutionary effects:

- the discourse effects brought along with movement operations may be (at least as a logical possibility) attributed to the feature encoding of the head, instead of the head *per se*.
- the illocutionary effects should be attributed to the trigger of the head movement, instead of a consequence of HM (Wechsler 1991; Truckenbrodt 2006).

Thus, these instances of HM, despite the rich literature in this topic, may not serve as a knock-down argument for HM with semantic effects.

Literature specifically addressing the scope effects of HM, however, is scarce.

- the most discussed cases of HM involve non-quantificational heads: most commonly, they are of type  $\langle e, t \rangle / \langle e, \langle e, t \rangle \rangle$  for verbs or  $\langle e \rangle / \langle e, t \rangle$  for nouns
- most cases of HM in Germanic/Romance languages are triggered by categorial features

- (44) HM may impose semantic effects if
- a. the head is of quantificational type (i.e.  $\langle \langle \alpha, t \rangle, t \rangle$ ) and;
  - b. the movement is not triggered by categorial features.

This puts quantificational elements like determiners, modal verbs, aspectual verbs and negation under the spotlight.

(45) Different proposed HM with semantic effects

- a. *Determiner raising*: Japanese split QP (where the *wh*-expressions occur at a distance with the associating determiner) is argued to be derived via overt raising of the universal determiner *-mo* (Takahashi 2002).
- b. *Negation raising*: In Japanese and Korean, the negation is pied-piped with verb movement to a higher position that allow the negation to take scope over the object (Han, Lidz, and Musolino 2007; Sato and Maeda 2020)
- c. *Negative auxiliary inversion*: In West Texas English, the negation can be fronted over the (quantificational) subject, resulting in wide scope reading of negation (Matyiku 2017)
- d. *Modal covert movement*: In English, possibility modals (i.e. *can*) move covertly over the negative universal quantifiers to derive a split scope reading (Lechner 2007)
- e. *Modal overt movement over negation*: A subset of modals (i.e. positive polarity modals like *must* in English) moves over negation to escape negative scope (Iatridou and Zeijlstra 2013)
- f. *Fronting of aspectual verbs*: In Shupamem (and potentially Dutch), aspectual verbs like ‘begin’ can be fronted over the subject and takes scope over it (Szabolcsi 2010, 2011)

Some issues:

- Alternative analyses have been suggested, discussed in Shimoyama (2006), Richter and Sailer (2008), Hall (2015), McCloskey (2016), Zeijlstra (2017), and Harizanov and Gribanova (2019).
- McCloskey (2016) suggests that if, following Szabolcsi, aspectual verbs are quantifiers over time variables, then we expect to see the same scope effects with heads that involve quantification over world variables.
- This concern also applies to proposals on modals which consistently exclude a comparison with aspectual verbs.

(46) Aspectual verbs in Shupamem (Szabolcsi 2010, p.38)

- a. Ndùù Maria ka **yeshe** inget ndàà liʔ. ‘only’ > ‘begin’  
only Maria past begin have.inf good roles  
‘Only Mary is such that she began to get good roles’
- b. A ka **yeshe** ndùù Maria inget ndàà liʔ. ‘begin’ > ‘only’  
it-FOCUS past begin only Maria inf.have good roles  
‘It began to be the case that only Mary is getting good roles’

## Appendix B: Alternative analyses to a head movement account

❶ A (subject) lowering approach:

Verbs do not move at all; instead, the surface word order and the scope effects result from an “lowering” operation of the subject.

(47) Deriving (2b) from (2a) under a subject lowering approach

[<sub>TP</sub> \_\_ begin [<sub>VP</sub> only Aaming get-good-result ] ]

*subject lowering*

Notably, Scope Economy would prevent “lowering” of non-quantificational elements, since it would not alter scope relations.

However, this approach does not extend to cases involving elements other than subjects.

(48) **hoici** [<sub>TOP</sub> cyunbou jan] Aaming dou \_\_ hou jansoeng (‘begin’ > every)  
 begin every person Aaming all very praise  
 ‘It begins to be the case that Aaming praises everyone.’

Under a lowering approach, to achieve the word order in (48), both the topic and the subject have to be lowered to a position below *hoici* ‘begin’. An attempted derivation is given in (49):

(49) An attempted derivation of (9a) under a subject lowering approach

\_\_ \_\_ begin [<sub>TOP</sub> every person ] [<sub>VP</sub> Aaming appreciate ... ]

⊗ A remnant VP movement approach (den Besten and Webelhuth 1990; Koopman and Szabolcsi 2000; Mahajan 2003, among many others)

- Before VP movement, all other elements except the verb are extracted from the VP.
- Accordingly, the remnant VP contains just a verb, and when it moves, it appears that the verb is moving on its own, but in fact it is a phrasal movement.

(50) Deriving (2b) from (2a) under a remnant movement approach

a. Baseline:

[<sub>TP</sub> only Aaming [<sub>VP1</sub> begin [<sub>VP2</sub> get-good-result ] ] ]

b. Fronting of the complement of ‘begin’, i.e. *νP2*:

[<sub>TP</sub> only Aaming [<sub>VP2</sub> get-good-result ] [<sub>VP1</sub> begin *t*<sub>VP2</sub> ] ]

c. Remnant phrasal movement of *νP1*:

[<sub>VP1</sub> begin *t*<sub>VP2</sub> ] [<sub>TP</sub> only Aaming [<sub>VP2</sub> get-good-result ] *t*<sub>VP2</sub> ]

Two issues: (i) The legitimacy of fronting *νP2* in (50b) must be stipulated.

(51) \*dak Aaming [<sub>VP2</sub> haau-dou hou singzik] **hoici**

only Aaming get-able good result begin

‘Only Aaming is such that he begins to get good results.’

(ii) It does not deliver the relevant scope facts. Even if ‘begin’ could take scope from there, it is expected that the sentence should be scopally ambiguous, since *νP* fronting reconstructs (cf. Huang 1993).

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