

## Quantifier-Raising a head\*

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### 1. Head movement and Quantifier Raising

This paper picks up two observations in movement theories. First, unlike phrasal movement, head movement (HM) is often reported to lack semantic effects, which has led some to eliminate HM from Narrow Syntax (i.e. HM is a phonological phenomenon, e.g. Chomsky (2001)). Second, the discussion on Quantifier Raising (QR, May 1985, i.a.) has primarily focused on nominal quantifiers; verbal quantifiers are seldom discussed. If QR is a genuine movement operation in the grammar, we expect to see either (i) verbal quantifiers can undergo QR or (ii) they cannot for a principled reason. Against this background, this paper addresses the two following questions:

- (1) a. Is HM an operation available in Narrow Syntax?
- b. Can QR apply to verbal quantifiers?

I provide an *affirmative* answer to both questions by suggesting that (i) HM can impose semantic effects, following Lechner (2007, Szabolcsi (2011) and Matyiku (2017) and that (ii) verbal quantifiers can undergo QR in the same way as their nominal counterparts. I present novel evidence from the distribution of aspectual verbs in Cantonese, which, as I argue, can undergo verb (head) movement that shifts the scopal relation with other quantificational elements. The paper is organized as follow: §2 discusses the possible positions of Cantonese aspectual verbs and their corresponding interpretations. §3 defends a head movement analysis on their distribution and suggests that the movement is regulated by Scope Economy (Fox 2000). §4 characterizes the proposed head movement as Quantifier Raising based on three different arguments. §5 discusses the implications of the current proposal for movement theories. §6 concludes the paper with two remarks.

### 2. The distribution of aspectual verbs in Cantonese

To take *hoici* ‘begin’ as an example, it canonically appears after the subject (=2). A pre-subject position is not available (=3).

- (2) Aaming hoici haau-dou hou singzik  
Aaming begin get-able good result  
‘Aaming begins to get good results.’

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\* For discussions, comments and judgements, I thank Stefan Keine, Winnie Lechner, Audrey Li, Roumi Pancheva, Sze-Wing Tang, Alexis Wellwood, Ka-Fai Yip and the audience in Syntax+ (USC), FoCaL-1, The 2nd Crete Summer School of Linguistics, LSA-93 and GLOW in Asia XXII and SICOOG 21. All remaining errors are mine.

- (3) \*hoici Aaming haau-dou hou singzik  
 begin Aaming get-able good result  
 Int.: ‘Aaming begins to get good results.’

However, in presence of a quantificational subject, *hoici* can either follow or precede the subject.

- (4) 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.’

- (5) 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 gets good results.’

As reflected in the translation, (4) and (5) give distinct interpretations with regard to the relative scope between *hoici* and the quantificational subject marked by *dak* ‘only.’ In either case, only surface scope is allowed. To illustrate the truth-conditional independence of (4) and (5), consider the scenarios given in Table 1 (modelled on Szabolcsi 2010, 2011). Assuming a class of three students, with (4), the speaker truthfully reports the scenario on the left, where the only student who begins to get good results is Aaming (i.e. from 40 marks to 100 marks), while the no improvement is seen for other students. (5) is false in this case, because Aaming is not the only one who is getting good results (but also Chris). In contrast, with (5), the speaker truthfully reports the scenario on the right, where it begins to be the case that only Aaming is getting good results (as Chris no longer gets good results). (4) is false in this case, because there is no improvement on Aaming’s results (i.e. he is already getting good results before May).

(4) only Aaming > begin		(5) begin > only Aaming	
Who is getting good results...			
Scores before May	Scores after May	Scores before May	Scores after May
Aaming: 40	Aaming: 100	Aaming: 100	Aaming: 100
Bill: 40	Bill: 40	Bill: 40	Bill: 40
Chris: 100	Chris: 100	Chris: 100	Chris: 40

Table 1 – Scenarios for (4) and (5)

The difference in position and interpretation is also observed in other aspectual verbs, such as *gaizuk* ‘continue,’ illustrated below:

- (6) a. (dak) Hoenggong gaizuk paai tau sapwai  
 only Hong.Kong continue rank initial tenth  
 ‘(Only) Hong Kong is such that she continues to rank among the first tenth.’  
 b. gaizuk \*(dak) Hoenggong paai tau sapwai  
 continue only Hong.Kong rank initial tenth  
 ‘It continues to be the case that (only) Hong Kong ranks among the first tenth.’

The upshot for the distribution is that the aspectual-verb-initial word order is allowed in presence of a quantificational subject and the scope of aspectual verbs are associated with their positions with respect to other quantificational elements.

### 3. A head movement analysis

#### 3.1 The proposal

To explain the distribution of *hoici* in sentences from (2) through (5), I propose a head movement analysis of aspectual verbs in Cantonese. For the sake of discussion, I primarily provide examples with *hoici* ‘begin’ but the same applies to other aspectual verbs.


(7) Head movement of *hoici* ‘begin’

(5) is derived from (4) by *hoici* ‘begin’ undergoing verb movement to a position higher than the subject.

Assuming a raising analysis of aspectual verbs (Perlmutter 1970; Li 1990), the subject undergoes the A-movement to Spec TP prior to the head movement of *hoici*. (8) below gives an illustration:

(8) Deriving (5) from (4) under a HM approach

hoici [TP dak Aaming<sub>i</sub> \_\_ [vP t<sub>i</sub> haau-dou hou singzik ]] *scope enrichment*



This explains why *hoici* can appear in a pre-verbal position in (5), but it over-generates to include (3). I suggest that this movement is constrained by an extended version of Scope Economy (Fox 2000), allowing it to apply to overt movement (Matyiku 2017).

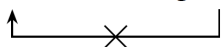
(9) Scope Economy (Fox 2000)

[Scope-shifting operations] that are not forced by type consideration must have a semantic effect.

With (9), we now have an account for the unacceptability of (3). In (3), the subject is a proper name, which is non-quantificational, HM of *hoici* would not result in a semantic effect comparable to the one in (5), where the subject is a quantificational one. In other words, the movement is disallowed for its semantic vacuity. (10) gives an attempted derivation of (3) from (2) under the current proposal.

(10) Attempted derivation of (3) from (2) under a HM approach

hoici [TP Aaming<sub>i</sub> \_\_ [vP t<sub>i</sub> haau-dou hou singzik ]] *vacuous movement*



#### 3.2 Further evidence for Scope Economy

Postponing the characterization of the proposed head movement to the next section, I present further evidence for how the distribution of aspectual verbs is regulated by Scope Economy. First of all, quantificational subjects other than *dak Aaming* ‘only Aaming’ also license the pre-subject position of *hoici*. In (11a), the subject is an existential quantifier while in (11b), it is a pronoun, which is not quantificational. Only the former allows for the head movement of *hoici* to the pre-subject position.

(11) Existential quantifiers vs. pronouns

*hoici* [sub<sub>j</sub> a. <sup>OK</sup>daiboufan-jan/ b. \*keoidei ] \_\_ haau-dou hou singzik  
 begin most-person they get-able good result  
 ‘It begins to be that case that <sup>OK</sup>most people/ \*they are getting good results.’

In addition to subjects, head movement of *hoici* can move across topics, if they are quantificational. Another minimal pair is given in (12). In (12), the subject is non-quantificational (i.e. Aaming). Head movement of *hoici* is allowed, only if the (left-dislocated) topic is quantificational, as in (12a) (but not (12b)). The contrast is readily explained by Scope Economy: only when the topic is quantificational can the movement of *hoici* have a semantic effect (on scope). Note that the status of a topic is signaled by the topic marker *ne*.

(12) Universal quantifiers vs. definite nominals

*hoici* [<sub>topic</sub> a. <sup>OK</sup>cyunbou-jan/ b. \*ni-go-jan ne] Aaming dou \_\_\_ hou jansoeng  
begin every-person this-CL-person TOP Aaming all very appreciate  
'It begins to be that case that, for <sup>OK</sup>everyone/ \*this person, Aaming is very appreciative of.'

Similar distribution of *hoici* is observed with (pre-subject) adverbials. Again, only the quantificational adverbial (i.e. 'at every school') licenses the head movement of *hoici*. Scope Economy correctly predicts the possible position of aspectual verbs.

(13) 'At every school' vs. 'at our school'

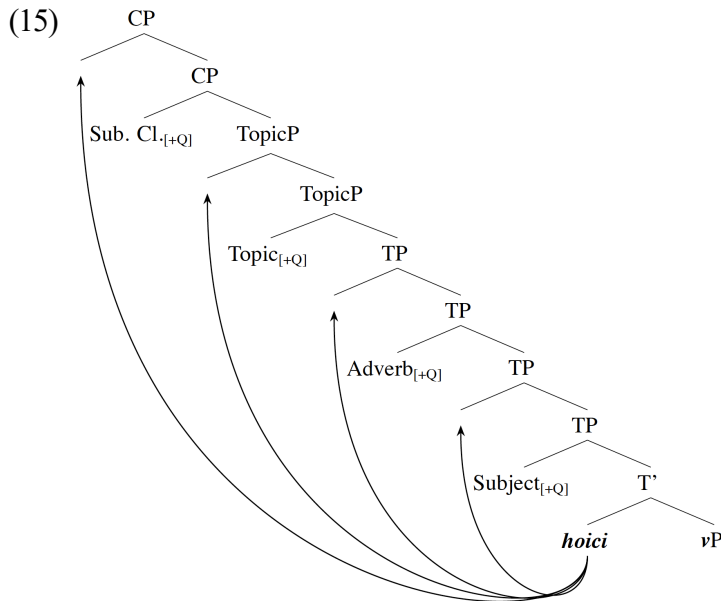
*hoici* [<sub>adv</sub> a. <sup>OK</sup>hai mui-gaan-hokhaau/ b. \*hai ngodei-hokhaau ] Aaming (dou) \_\_\_  
begin at every-CL-school at our-school Aaming all  
haau-dou hou singzik  
get-able good result  
'It begins to be that case that at <sup>OK</sup>every/ \*our school Aaming is getting good results.'

Finally, if a subordinate clause is quantificational (e.g. *whenever*-clause), *hoici* can even undergo head movement to a position preceding the whole clause; however, this is not the case for non-quantificational clause such as *because*-clause.

(14) Whenever-clause vs. because-clause

*hoici* [<sub>CP</sub> a. <sup>OK</sup>faanhai daa-fung/ b. \*janwai daa-fung ] hoimin (dou)  
begin whenever approach-typhoon because approach-typhoon sea all  
\_\_\_ wui jau daailong  
will have big.wave  
'It begins to be the case that <sup>OK</sup>whenever/ \*because typhoons approach, there will be big waves on the sea.'

The minimal pairs in (11) to (14) consistently show that the distribution of *hoici* is fully regulated by Scope Economy. Put differently, head movement of *hoici* is allowed if the movement crosses a c-commanding quantificational element, which could be a subject, a topic, an adverbial or a subordinate clause. Importantly, its movement obtains scope significance: *hoici* receives a wide scope reading after the movement in (11) to (14). The movement of *hoici* is diagrammed in (15). The proposed head movement is implemented as head-phrase adjunction in (15) for empirical reasons: it captures the variable possible landing sites of the movement. It is admitted that this conception of head movement departs from not only the head-head adjunction approach to head movement, but also a number of others, e.g. head-spec movement (e.g. Matushansky 2006), reprojective movement (e.g. Donati 2006), and many others. However, anticipating a Quantifier Raising (QR) analysis in section 4, head movement as adjunction is consistent with May's (1985) characterization of QR, which is by nature an adjunction rule.



For scope reason, I will set aside the theoretical concerns with regard to head movement, but end this section with a prediction made by the adjunction approach: if there is multiple quantificational elements c-commanding *hoici*, we predict multiple landing sites of *hoici*, as there are more than one way to shift the relative scope. This is borne out in (16), where both the adverbial and the subject are quantificational. *Hoici*, as predicted, can land on a position preceding either the former or the latter:

(16) A quantificational adverbial and a quantificational subject

a. hoici [adv hai mui-gaan-hokhaau ] b. hoici [subj daaiboufan-jan] dou \_\_\_ haau-dou  
 begin at every-CL-school begin most-person all get-able  
 hou singzik  
 good 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.'

### 3.3 Alternatives

There are two families of alternatives to a head movement analysis. One family suggests that the aspectual verb does not move at all, hence no head movement, whereas the other one suggests nothing moves at all: there are multiple base generation positions for the verbs. In what follows, I present counter-arguments to these approaches.

Recall our examples in (4) and (5). A subject lowering approach may suggest instead that *hoici* does not move at all; it is the subject that undergoes lowering (or reconstruction) to its *vP*-internal position. This can be achieved by Quantifier Lowering. Alternatively, it could be that the subject is reconstructed at LF and at the same time, its lower copy is pronounced at PF. This is reminiscent of Bobaljik's (2002) suggestion that both LF and PF 'privileges' the lower copy. This idea is illustrated in (17):

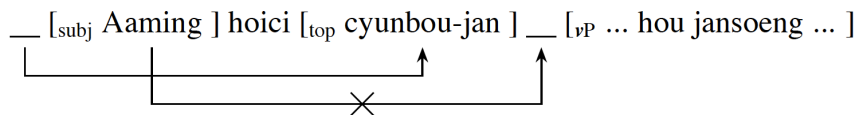
(17) Deriving (5) from (4) in a subject lowering approach

[<sub>TP</sub> \_\_\_ hoici [<sub>vP</sub> dak Aaming haau-dou hou singzik ]]

*subject reconstruction*

Similar to a head movement approach, a subject lowering approach would suggest lowering is regulated by Scope Economy, so that (3) is ruled out as lowering the non-quantificational subject (i.e. a proper name) gives rise to vacuous movement. However, this approach faces challenges when it comes to sentences involving elements other than the subject. The lowering approach relies heavily on the lower position of subject in accounting for (3) and (4), but, as we have seen in section 3.2, not all cases involve a quantificational subject. Consider an attempted derivation for (12a), where *hoici* appears to the left of both the topic and the subject.

(18) (Halfway) derivation of (12a) under a subject lowering approach



In (18), the quantificational topic *cyunbou-jan* undergoes lowering to a position below *hoici*. It is questionable whether such position already exists in the derivational history. More importantly, to derive the correct word order, the non-quantificational subject (i.e. *Aaming*) has to be lowered as well. Yet, this lowering violates Scope Economy in the same way as (3). (18) is then ruled out for the same reason as the unacceptability of (3). The same challenge applies to (13a) and (14a) as well.

Another alternative to head movement is remnant-VP movement. The idea is that prior to the movement of the whole *vP* (one that contains *hoici* and its complements), all elements except for *hoici* have been extracted from the VP, such that when the whole VP moves, it appears that the verb alone is moving. However, this approach presumes a productive scrambling mechanism that extracts the complement of an aspectual verb, whose existence in Chinese has been called into questions by Soh (1998) and Cheng and Vicente (2013). Additionally, it is difficult to see how a remnant-VP movement approach could account for the scopal interaction between the aspectual verb and the quantificational subject. The verb, even displaced, is still embedded within the *vP*, meaning that it does not c-command the subject like the proposed head movement approach does, or one would have to propose a way of scope determination other than c-command relation, inducing further theoretical complications.

Lastly, one might suggest that aspectual verbs can have multiple base generation position, i.e., it can base generate after the subject, as in (4), or before the subject, as in (5). To account for the unacceptability of (3), one might have to connect the possible base generation of an aspectual verb with the quantificational nature of the element that immediately follow it. It will require something like: ‘an extra base generation position is available if that position is immediately followed by a quantificational element,’ which is considerably unconventional. On the other hand, a movement analysis benefits from an independently motivated constraint on movement (i.e. Scope Economy), which accurately predicts the distribution of aspectual verbs in various cases. I therefore conclude that a head movement approach suggested in section 3.1 is superior to other alternatives.

### 3. Head movement as Quantifier Raising

If a movement analysis is on the right track, an immediate question concerns the nature of this movement. I suggest that the movement of aspectual verbs in Cantonese is best characterized as Quantifier Raising, based on the following three arguments.

#### 4.1 Similarity to English QR

The proposed movement is similar to English QR in at least three ways. First, both are optional. The optional word order displayed in (4) and (5) suggests that movement is not an obligatory one. Since English QR is proposed as a covert operation, its optionality is revealed as scope ambiguity (i.e. optional scope possibility) in sentences like (19):

(19) A boy admires every teacher. (a > every; every > a, Fox 2000:30)

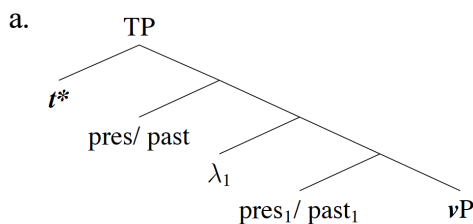
Second, both movement operations are sensitive to Scope Economy. As argued in section 3.2, the distribution of aspectual verbs in Cantonese is regulated by Scope Economy, in an identical way as English QR (see Fox 2000 for extensive discussion).

Third, unlike many other movement operations that target a particular position (e.g. the specifier of a projection), we have seen that the proposed head movement can land above TP, TopicP or CP (as in (15)), as long as Scope Economy is observed. In a similar vein, the landing sites of QR in English, although not uncontroversial, has been proposed to be S (e.g. May 1985), VP (e.g. Williams 1997, May 1985), DP (e.g. Rooth 1985, Larson 1987) or NP (e.g. Huang 1982). While the exact range of possible landing sites is still a matter of debate, QR also appears to enjoy a greater flexibility in its destination, as opposed to other movement operations. Based on these parallels between the proposed head movement and English QR, I suggest that the former should be regarded as a subtype of Quantifier Raising.

#### 4.2 Aspectual verbs as generalized quantifiers over times

In this section, I sketch the semantic of *hoici* to illustrate that aspectual verbs in Cantonese not only can be analyzed as generalized quantifiers (over times), but also are best to be regarded as such in terms of semantic compositionality. The following discussion is couched in a framework on tense by Kusumoto (2005), assuming  $\nu P$  to be the event core of type  $\langle i, t \rangle$  (functions from time to truth value).

(20) Kusumoto's (2005) framework on tense



- b.  $t^*$ : The speech time provided by the context
- c. pres/past: Null operator on time variables (of type  $\langle \langle i, t \rangle, \langle i, t \rangle \rangle$ )<sup>1</sup>
- d. pres<sub>1</sub>/ past<sub>1</sub>: Time variables, realized as tense morphemes

Against this background, following Szabolcsi (2011), I suggest that aspectual verbs in Cantonese are of generalized quantifiers over times (of type  $\langle \langle i, t \rangle, t \rangle$ ). They base generate in a projection above  $\nu P$  (cf. Fukuda 2008, 2012). The semantics of *hoici*, as an example, can be expressed as follows:

<sup>1</sup> For example, the semantics of the past and pres operator can be expressed as follows:

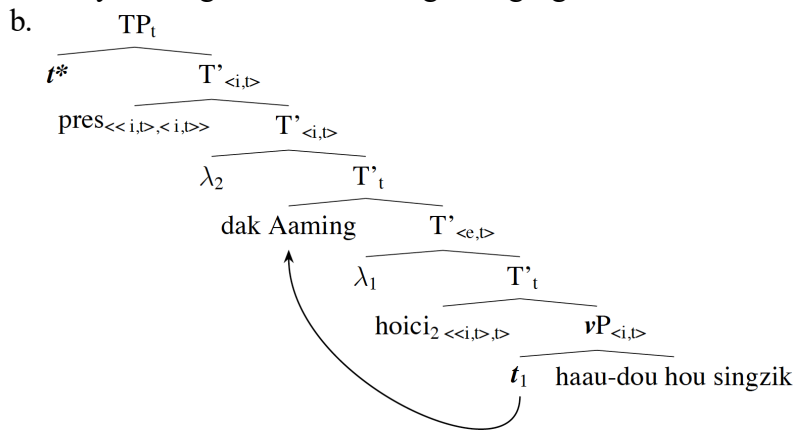
$$\llbracket \text{past} \rrbracket = \lambda P_{\langle i, t \rangle}. \lambda t. \exists t' [t' < t \wedge P(t')] ]$$

$$\llbracket \text{pres} \rrbracket = \lambda P_{\langle i, t \rangle}. \lambda t. \exists t' [t' = t \wedge P(t')] ]$$

- (21)  $[[hoici_1]] = \lambda P_{\langle i,t \rangle}. \exists t' \exists t'' [t' < t_1 \leq t'' \wedge \neg P(t') \wedge P(t'')] ]$   
 (Read as: There exist two time intervals  $t'$  and  $t''$  s.t.  $t' < t_1 \leq t''$  and  $P$  is false at time  $t'$  and  $P$  is true at time  $t''$ )

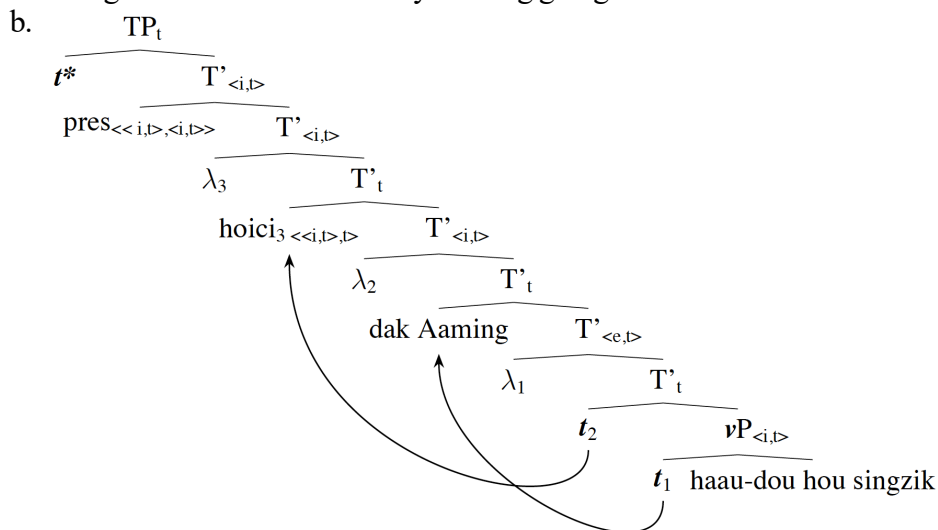
Note that the time variable in the lexical semantics of *hoici* is bound by the null pres/past operator, in the same way as tense morphemes. Assuming the standard subject movement (for Case), the sentences in (4) can be derived compositionally as follows:

- (22) a. dak Aaming hoici haau-dou hou singzik ('only' > 'begin'; repeated from (4))  
 only Aaming begin get-able good result  
 'Only Aaming is such that he begins to get good results.'



For (5), where *hoici* undergoes head movement as proposed, it is instructive to note that the movement leaves a trace of a lower type, namely, a time variable (i.e.  $t_2$  in (23b)), the treatment of which is identical to nominal generalized quantifiers (cf. Heim & Kratzer 1998).

- (23) a. hoici dak Aaming haau-dou hou singzik ('begin' > 'only'; repeated from (5))  
 begin only Aaming get-able good result  
 'It begins to be the case that only Aaming gets good results.'



A generalized quantifier approach to aspectual verbs avoids the complication discussed in Szabolcsi (2011) for head movement, where she suggests 'begin' could be of a modifier type  $\langle\langle i,t \rangle, \langle i,t \rangle\rangle$ .





with the findings of head movement with semantic effects in various languages, as summarized in Table 2 below.

	Effect	Language	Phenomenon
Matushansky (2006)	Scope enrichment	English	Modals and negation
Lechner (2007)		English	Modals
Szabolcsi (2011)		Shupamen, Dutch	Aspectual verbs
Matyiku (2017)		West Texas English	Neg.-Aux. Inversion
Keine and Bhatt (2016)	Scope reconstruction	German	Passives
Roberts (2010)	NPI licensing	English	Subj.-Aux. Inversion
Szabolcsi (2010)		English	Imperatives

Table 2 – Reported evidence for the semantic effects of head movement

Note that I am not claiming *all* head movements are in Narrow Syntax. It is plausible, as Harizanov & Gribanova (2019) suggests, that various instances of head movement can be divided into two classes: syntactic ones and post-syntactic ones. Evidence comes from German V-C movement.

(26) German (p.c. Stefan Keine)

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

In both sentences, 'began' scopes below 'only'. In particular, (26b) shows that although 'began' moves across the subject associated with 'only,' the movement does not result in scope shifting (i.e. wide scope 'began' interpretation). The verb movement in German imposes no semantic effects comparable to the *hoici*-case in Cantonese. It is possible that the German V-C movement is non-syntactic/ post-syntactic, supporting Harizanov & Gribanova's (2019) dichotomy of head movement.

## 5.2 Scope Economy is a general constraint

As we have seen in section 3, Scope Economy applies to overt operations, in addition to covert operations (as is originally proposed for English QR). Independent evidence for this claim comes from West Texas English, as discussed extensively in Matyiku (2017).

(27) West Texas English (Matyiku 2017)

- a. Everybody didn't see the fight. (everybody > not / \*not > everybody)
- b. Didn't everybody see the fight. (\*everybody > not / not > everybody)
- c. \*Didn't Jaime see the fight.

Note that both (27b) and (27c) are intended to be a declarative sentence. They suggest that negation can appear before the subject only if the subject is quantificational. Matyiku (2017) defends an (overt) head movement account for the displacement of negation which is constrained by Scope Economy in the same way as the *hoici*-case discussed in this paper. Scope Economy should then be regarded as a general constraint on syntactic movement, regardless of overt or covert syntax. This indeed eliminates

an asymmetry between overt and covert syntax: there is no covert-syntax-specific constraints. This resulting picture lends further support to the Single Out Syntax, where the syntax module of the grammar derives a single representation (Brody 1995, Bobaljik 1995, 2002, Graot and O’Neil 1996).

### 5.3 QR applies to both heads and phrases

In addition to nominal quantifiers, QR can target heads like aspectual verbs and modal verbs, suggesting that the target of QR has nothing to do with the head/phrase status; instead, it is the semantic type (i.e. the type of generalizer quantifiers  $\langle\langle\tau, t\rangle, t\rangle$ , where  $\tau$  can be of type  $e$ ,  $i$  or  $s$ ). Indeed, recent studies also suggest A’-movement can target heads. Cheng and Vicente (2013) argue for a movement analysis of verb topicalization/ focalization construction in Mandarin, where a verb is fronted and doubled. I provide the Cantonese counterpart of these constructions:

(28) a. Verb topicalization

soeng Aaming hai soeng heoi ge  
 want Aaming be want go SFP  
 ‘(Talking about whether he wants to go or not, Aaming wants to go.’

b. Verb focalization in *lin...dou* ‘even’-construction

lin lum Aaming dou m gaam lum  
 even think Aaming DOU not dare think  
 ‘Even for thinking, Aaming does not dare (to think about it).’

They suggest that verbs can undergo head movement triggered by the A’-feature, similar to standard cases of topicalization and focalization which involve phrasal elements. Additional evidence comes from right dislocation in Cantonese, discussed in Lee (2017), where right-dislocated elements can either be a phrase or a head:

(29) a. Right dislocation targeting a phrase

Aaming zeoihau jau mou maai ti aa [NP gaa-ce ]<sub>i</sub>  
 Aaming at.the.end have not.have buy SFP CL-car  
 ‘Has Aaming bought the case at the end?’

b. Right dislocation targeting a head

Aaming jatzik dou ti heoi dusyu ge [V soeng ]<sub>i</sub>  
 Aaming straight all go study SFP want  
 ‘Aaming wants to go to study all the time.’

Lee argues that both the NP and the V undergoes movement to the sentence-final position and both movements are triggered by a defocus feature (an A’-feature) associated with the right-dislocated element. These data point to a possibility of unifying head and phrasal movement in the grammar: movement operations are blind to the head/phrase distinction. There is no head- or phrase-specific movement operation. Movement that appears to be exclusively on heads or phrases might be due to other constraints on movement. I leave exploration of this idea to future research.

## 6 Concluding remarks

The case study of aspectual verbs in Cantonese reveals that head movement can impose semantic effects and hence head movement cannot be eliminated from Narrow Syntax entirely. In addition, QR as a syntactic operation receives further empirical support in that not only nominal quantifiers but also verbal quantifiers can be targeted for QR. Importantly, both cases are constrained by Scope Economy.

I end with two remarks. Concerning the nature of QR, QR appears to be uniquely constrained by Scope Economy, among other operations. If we assume other movement operations escape from Scope Economy by virtue of (formal/discourse) feature checking, conformity to Scope Economy can be derived if we assume QR is non-feature-driven. Imposing semantic effects is the only way to avoid vacuous operation in the syntax. This links to a general condition on syntactic operations, following Chomsky (2000):

(30) Operations can apply only if they have an effect on outcome.

If we define ‘an effect on outcome’ to be either feature checking or semantic effects, then Scope Economy follows from (30) and QR is minimally different from other operations in terms of the presence/absence of a triggering feature. In other words, if an operation fails to check any feature, it must impose semantic effects (and vice versa). Vacuous operation in syntax is forbidden. On the other hand, I have been agnostic on why sentences like (5) are unambiguous. In principle, a narrow scope reading of *hoici* in (5) is expected to be available if it is reconstructed at LF, but the unambiguity of (5) suggests that reconstruction is unavailable. I suggest that its unavailability is exactly what Scope Economy predicts for (5). Reconstruction of an operation whose sole ‘outcome’ is imposing semantic effects would give rise to a vacuous operation, in violation of (30). In other words, there appears to be complementary distribution between Scope Economy and reconstruction: operations that are sensitive to Scope Economy cannot be reconstructed, and vice versa.

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