QUANTIFIER SCOPE IN VIETNAMESE

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A thesis submitted for the degree of Master of Philosophy in Linguistics at UCL

Declaration

I, Anh Duy La, confirm that the work presented in my thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Abstract

This thesis looks at the phenomenon of quantifier scope in Vietnamese, an Austroasiatic language. The main claim is that Vietnamese does not have Quantifier Raising (QR) as either a scope-shifting or a scope-interpreting mechanism. Instead, quantifiers are interpreted in their surface positions through a system based on Keenan's (2016) analysis. In order to demonstrate this, I examine four types of constructions in Vietnamese: transitives, ditransitives, passives, and inverse-linking. While the former three exhibit clear scope rigidity, the last type seems to allow inverse scope at first glance. Despite this, the inversely-linked reading can be attributed to overt movement and surface interpretation.

Impact Statement

The contribution of this thesis is threefold. First, it aims to make a descriptive contribution to research on Vietnamese through delineating the interactions of quantifiers, their scopal properties and how they shed light on certain grammatical structures in the language such as ditransitives or passives. Through this, the thesis can broaden our understanding of quantifier scope and especially Quantifier Raising in natural language. Finally, the surface interpretation system presented in the thesis can provide insights into how quantifiers take scope in languages showing scope rigidity similar to Vietnamese.

Acknowledgements

First and foremost, I would like to thank my supervisor, Klaus Abels, who has been a supportive and accommodating guide with his sharp and invaluable insights. Thank you for pushing me out of the comfort zone with challenging questions that force me to always re-examine what I think I know. I'd also like to thank my Vietnamese friends and relatives for offering judgements and data which helped me build my thesis. My last thanks go out to my parents, who have always had their unfaltering trust in me.

Contents

1 Introduction

Doubly-quantified sentences are known to be able to introduce scopal ambiguity. However, there is cross-linguistic variation concerning this phenomenon. In English, SVO sentences with an existentially quantified subject and universally quantified object (henceforth $S_{\exists}$ V $O_{\forall}$) are scopally ambiguous (May, 1977, 1985, among others). On the other hand, Chinese $S_{\exists}$ V $O_{\forall}$ sentences are unambiguous (Aoun & Li, 1993; Huang, 1982; Scontras et al., 2017). Japanese presents a slightly different picture. Specifically, canonical $S_{\exists}$ $O_{\forall}$ V sentences are scopally unambiguous, similar to Chinese, while scrambled $O_{\exists}$ $S_{\forall}$ V sentences are ambiguous (Hoji, 1985).

In this paper, I argue that quantifier phrases in Vietnamese are interpreted in their surface position and Quantifier Raising (QR) is not needed. Section 2 outlines roughly how the scope judgements were obtained. In section 3, I will show that there is no evidence of QR as a scope-shifting mechanism. Section 4 argues that the apparent exception of inverse-linking constructions (ILCs) can be attributed to overt movement and subsequent surface interpretation. Section 5 elaborates on Keenan's (2016) analysis and expands it into a more generalised system, thus obviating the need for QR as a scope interpretation mechanism as used in May (1977) and Heim & Kratzer (1998). Finally, section 6 concludes.

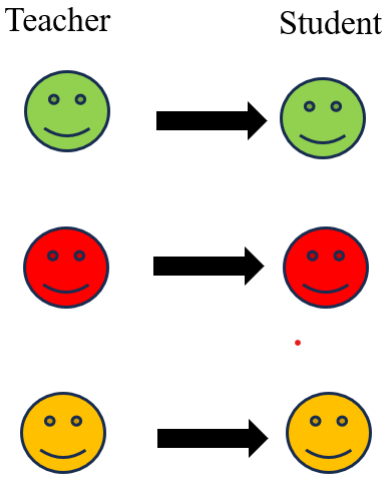
2 Scope judgement elicitation

All of the scope judgements of the Vietnamese examples were collected from 12 native Vietnamese speakers. All of them were born and are still living in Vietnam. The age range is 23 to 60 years old. All can use English as an L2-language but the degree of proficiency varies. The scope reading data come from picture-matching tasks. The availability of a reading is judged based on whether the informants accept the graphic representation associated with that

reading. For instance, the scope reading(s) of the sentence (i) will be elicited through the informants choosing/rejecting (ii) or (iii).

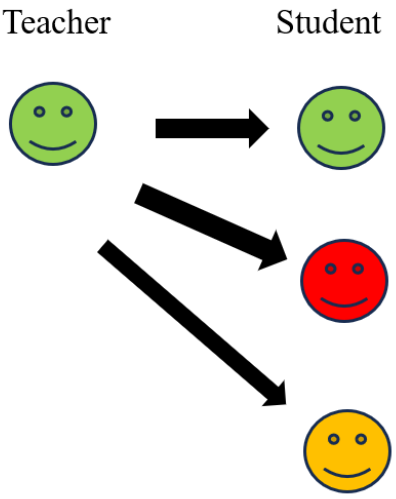
(i) Một thầy-giáo dạy mọi học-sinh.
One teacher teach every student
A teacher teaches every student.

(ii)



(every student > a teacher)

(iii)



(a teacher > every student)

3 QR as a scope-shifting mechanism in Vietnamese

In this section, I present three key constructions, transitive, ditransitive, and passive, to demonstrate the lack of inverse scope, and thus, of QR as a scope-shifting mechanism.

3.1. Transitives

Transitive constructions in Vietnamese assume the SVO order similar to English and Chinese.

(1) a. Một người-đàn-ông mua mọi/mỗi quyển-sách.

One Cl-man buy every/each Cl-book

One man bought every/each book.

'There is one man who bought every/each book.'

**'For every/each book, one man bought that book.'*

b. Nhiều hơn hai người-đàn-ông mua mọi/mỗi quyển-sách.

Many than two Cl-man buy every/each Cl-book

More than two men bought each/every book

'There were more than two men who bought each/every book.'

**'For every/each book, there were more than two men who bought that book.'*

c. Mọi/mỗi người-đàn-ông mua nhiều hơn hai quyển-sách.

Every/each Cl-man buy many than two Cl-book

Every/each man bought more than two books.

'For every/each man, he bought more than two books.'

**'There were more than two books that every/each man bought.'*

d. Không người-đàn-ông nào mua nhiều hơn hai quyển-sách.

No Cl-man which buy many than two Cl-book

No man bought more than two books.

'There was no man such that he bought more than two books.'

**'There were more than two books which no man bought.'*

e. Không người-đàn-ông nào mua mọi/mỗi quyển-sách.

No Cl-man which buy every/each Cl-book

No man bought every/each book.

'There was no man such that he bought every/each book.'

**'For every/each book, there was no man such that he bought that book.'*

As shown in examples (1a-e), the only possible scope interpretation is the surface one while inverse scope is absent. This observation contrasts with the English data but mirrors the patterns in Chinese. Specifically, it appears that surface structural relation corresponds to scope relation at LF. Huang's (1982, p.220) General Condition on Scope Relation states as follows:

(2) Suppose A and B are both QPs or both Q-NPs or both Q-expressions, then if A c-commands B at SS, A also c-commands B at LF.

This principle does seem to explain the data in example (1) quite nicely. In (1a-e), the QP in the subject c-commands the object QP. As a result, we expect the former to take scope over the latter at LF. This expectation is borne out. On the other hand, no inverse scope is predicted as

the scope relation must mirror the surface-structural one. Hence, if one wants to obtain inverse scope, a different syntactic structure is required.

There is, nonetheless, a counterexample to this principle: transitive constructions with an indefinite object.

(3) Mọi/mỗi người-đàn-ông mua một quyển-sách.
Every/each Cl-man buy one Cl-book
Every/each man bought a book.
'For every/each man, he bought a book.'
'There was a specific book that every/each man bought.'

In (3), the object indefinite seems to be able to scope over the subject, contrary to the prediction from (2). This wide-scope property, however, is known in the literature as *exceptional scope*. Fodor & Sag (1982) point out that indefinites do not respect scope islands.

(4) a. If a friend of mine from Texas had died in the fire, I would have inherited a fortune.
'If it is the case that a random friend of mine from Texas had died in the fire, I would have inherited a fortune.'
'There is a specific friend of mine from Texas that if he died, I would have inherited a fortune.'
b. If each friend of mine from Texas had died in the fire, I would have inherited a fortune.
'If, for each friend of mine from Texas, he had died in the fire, I would have inherited a fortune.'
**'For each friend of mine from Texas, if he had died in the fire, I would have inherited a fortune.'*
c. If no friend of mine from Texas had died in the fire, I would have inherited a fortune.
'If it is the case that none of my friends from Texas had died in the fire, I would have inherited a fortune.'
**'For none of my friends from Texas, if they had died in the fire, I would have inherited a fortune.'*

(Fodor & Sag, 1982, p.369-370)

It is clear from examples (4b) and (4c) that quantifiers such as *each* and *no* respect *if*-clause island. Indefinites, on the contrary, apparently can scope out of the island, as demonstrated in (4a). Fodor & Sag propose that indefinites are ambiguous between a quantified expression and a referential one. The quantified expression does obey island boundaries like other quantifiers whereas the referential expression points to a specific entity that the speaker has in mind. For

instance, in (4a), the first reading shows the indefinite being interpreted as a quantifier and obeying the *if*-clause island. The second reading, on the contrary, is produced by interpreting the indefinite as a referential expression, thus giving the impression of a wide-scope reading that does not respect islands. Similarly, Vietnamese shows a dichotomy between indefinites and other quantifiers when it comes to scope islands.

(5) a. Nếu mọi đứa-bạn của tôi trúng sổ-xố, tôi sẽ có một căn-nhà.
If every CL-friend POSS I hit lottery, I FUT have one Cl-house
If every friend of mine wins the lottery, I will have a house.
'If for every friend of mine, they win the lottery, I will have a house.'
**'For every friend of mine, if they win the lottery, I will have a house.'*

b. Nếu một đứa-bạn của tôi trúng sổ-xố, tôi sẽ có một căn-nhà.
If one CL-friend POSS I hit lottery, I FUT have one Cl-house
If a friend of mine wins the lottery, I will have a house.
'If a random friend of mine wins the lottery, I will have a house.'
'There is a specific friend of mine such that, if they win the lottery, I will have a house.'

c. Nếu không đứa-bạn nào của tôi trúng sổ-xố, tôi sẽ có một căn-nhà.
If no friend which POSS I hit lottery I FUT have one Cl-house
If no friend of mine wins the lottery, I will have a house.
'If there is no friend of mine who wins the lottery, I will have a house.'
**'There is no friend of mine such that, if they win the lottery, I will have a house.'*

Examples (5a-c) demonstrate clearly how the indefinite *một đứa-bạn của tôi* seems to be able to scope out of the *if*-clause island while the universal *mọi đứa-bạn của tôi* and the negative quantifier *không đứa-bạn nào của tôi* cannot. Schwarzschild (2002) advances a different analysis, focusing on the domain restriction of quantifiers. In particular, according to him, indefinites are not ambiguous, contra Fodor & Sag, but their domain can be implicitly restricted to a singleton set. As a result, the singleton indefinite behaves similarly to a referential expression. In (4a), the indefinite *a friend of mine from Texas* can have its domain implicitly restricted to a singleton set.

(6) a. A man sings.
b. $\exists x \in D[\text{man}(x) \wedge \text{sing}(x)]$
c. $D = \{z\}$
d. $\text{man}(z) \wedge \text{sing}(z)$

(6b) shows the domain of the indefinite in (6a). If there exists a specific man *z* that the speaker wants to refer to, the domain is implicitly restricted to a singleton set as shown in (6c). As a result, the indefinite will yield a referential reading as in (6d). This, nonetheless, does not mean the indefinite is ambiguous between a referential and a quantifier reading. Instead, the referential interpretation is produced as an effect of restricting the indefinite's domain.

A third line of analysis is cast in terms of choice functions (Reinhart 1997, Winter 1997, Winter 2001). Indefinites, in this case, can be interpreted as choice functions which map a non-empty set to one of its members.

(7) a. Every lady reads some book.

b. $\exists f\ (CH(f) \wedge \forall z\ (lady(z) \longrightarrow z \text{ read } f(book)))$

(Reinhart 1997, p.372)

What (7b) means is that there exists a choice function f such that, for every z such that, z is a lady, z reads the book picked out by this function f. In effect, this is the wide-scope reading of the object indefinite. This approach can generate exceptional-scope readings of indefinites without resorting to movement or domain restriction and incurring any island effect.

So far, I have presented three main approaches to the exceptional-scope interpretation of indefinites. Nonetheless, it is not the goal of this paper to decide which is the best for Vietnamese. The point is showing that wide-scope readings of indefinites in Vietnamese can be achieved through one of those three analyses without the need for QR.

3.2. Ditransitives

I will now look at ditransitive constructions. There are two separate ditransitive constructions in Vietnamese, as shown in (8).

(8) a. Tôi đưa quyển-sách *(cho) Nam.
I give CL-book to Nam
I give the book to Nam.

b. Tôi đưa (cho) Nam quyển-sách.
I give to Nam CL-book
I give Nam the book.

The preposition is obligatory for the IO in the V-DO-IO order in (8a). The V-IO-DO order (8b), on the other hand, can optionally have the preposition before the IO. Oehrle (1976) observes that in English, the double object construction (V-IO-DO) requires its goal to be

animate while in the dative construction (V-DO-IO), the goal can be either a location or an animate entity.

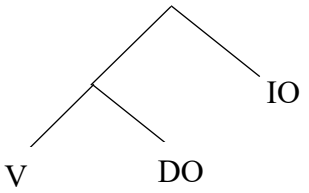
(9) a. The King sent a telegram to London.
b. The King sent London a telegram.

In (9a), London can be interpreted as either the location (the city) or an animate entity (the government) while in (9b), it has to be understood as the government. (10a) appears to show a similar situation in Vietnamese. However, (10b) immediately dispels this impression as the goal here is also interpreted as an animate entity.

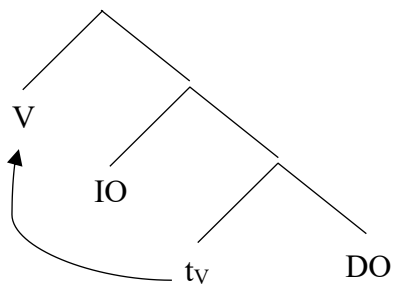
(10) a. Nhà-vua gửi London một bức-điện-tín.
Cl-king send London one Cl-telegram
The King sent London a telegram.
b. Nhà-vua gửi một bức-điện-tín cho London.
Cl-king send one Cl-telegram to London
The King sent a telegram to London.

The reason is the preposition. It turns out that Vietnamese employs two different prepositions to express what *to* does in English. The preposition used in (9) and (10) has to be associated with an animate entity, explaining why (10b) forces such a reading. The other preposition, *tới*, is related to a location. Thus, if we replace *cho* with *tới* in (10b), we get the location reading. Similarly, the IO in (10a) can be construed as a location should it be preceded by *tới*. However, if it opts to take no preposition, it can only be interpreted as an animate entity. Of course, this is merely a passing observation on the semantics of Vietnamese ditransitives, which is not the goal of this paper. For reasons of space, I now move on to the main point. I propose that the V-DO-IO and V-IO-DO orders assume the structures in (11a) and (11b) respectively.

(11) a.



b.



The structure in (11b) was proposed by Larson (1988b, 1990) to account for double-object constructions in English while the one in (11a) is a more traditional treatment challenged by Larson but later backed by Ernst (1994).

Janke & Neeleman (2012) argue that English ditransitive constructions assume these two structures. In addition, Polish ditransitives have also been analysed similarly to English ones (Abels & Grabska, 2022). Drawing on their work, I advance three arguments in support of the idea that Vietnamese ditransitives have two distinct hierarchical structures, a rightward ascending one for the V-DO-IO order and a rightward descending one for the V-IO-DO order: topicalisation, interactions of ditransitive constructions with numerically quantified adverbs, and quantifier scope in doubly-quantified ditransitives.

First, topicalisation demonstrates that in Vietnamese dative construction, the verb and DO can be fronted, whereas the V-IO or the DO-IO cannot be.

(12) a. Gửi một bức-thư thì tôi đã làm tới mọi thành-phố.
send one Cl-letter TOP I PRF do to every city
Send a letter I did to every city.
b. *Gửi tới mọi thành-phố thì tôi đã làm một bức-thư.
send to every city TOP I PRF do one Cl-letter
**Send to every city I did a letter.*
c. *Một bức-thư tới mọi thành-phố thì tôi đã gửi.
one Cl-letter to every city TOP I PRF send
**A letter to every city I sent.*

Examples (12a-c) show that the verb and the DO form a constituent while the V and the IO or the IO and the DO do not. Thus, these results rule out a rightward ascending structure and favour a rightward ascending one.

The second argument comes from the scopal interaction of numerically quantified adverbs in Vietnamese ditransitive constructions. Drawing on the argument made in Abels & Grabska (2022), I argue that the insertion of a numerically quantified adverb, such as *hai-lần* (two-time) highlights the fact that in both the V-DO-IO and V-IO-DO orders, DO is hierarchically lower than IO, which is compatible with the structures presented in (11).

(13) a. Lan đưa một con-cá **hai-lần** cho vị-thuyền-trưởng.
Lan give one CL-fish two-time to CL-ship-leader
Lan gives a fish twice to the captain.

twice > a fish => two fish

b. Lan đưa con-cá **hai-lần** cho một vị-thuyền-trưởng.
Lan give CL-fish two-time to one CL-ship-leader
Lan gives the fish twice to a captain.
a captain > twice => one captain

In (13), which shows the V-DO-IO order, when *hai-lần* is inserted between DO and IO, the adverb takes scope leftward over DO and not rightward over IO in both examples, indicating again that the former is structurally lower than the latter.

(14) a. Lan đưa vị-thuyền-trưởng **hai-lần** một con-cá.
Lan give CL-ship-leader two-time one CL-fish
Lan gives the captain a fish twice.
twice > a fish => two fish

b. Lan đưa một vị-thuyền-trưởng **hai-lần** con-cá.
Lan give one CL-ship-leader two-time CL-fish
Lan gives one captain the fish twice.
a captain > twice => one captain

Examples (14a) and (14b) show how the V-IO-DO order interacts with *hai-lần*. This time, the adverb scopes rightward over DO instead of leftward over IO in both cases, suggesting that DO is lower than IO, similar to the situation of (13).

Lastly, the third argument also hinges on scope, but of quantifiers instead. In ditransitive constructions with DO and IO as quantifiers, their scopal interactions point to IO being structurally higher than DO in both orders.

(15) a. Lan đưa một con-cá cho mọi/mỗi vị-thuyền-trưởng.
Lan give one CL-fish to every/each CL-ship-leader
Lan gives a fish to every/each captain.
a fish > every/each captain
every/each captain > a fish

b. Lan đưa mọi/mỗi con-cá cho một vị-thuyền-trưởng.
Lan give every/each CL-fish to one CL-ship-leader
Lan gives every/each fish to a captain.
a captain > every/each fish
**every/each fish > a captain*

c. Lan đưa mọi/mỗi vị-thuyền-trưởng một con-cá.
Lan give every/each CL-ship-leader one CL-fish
Lan gives every/each captain a fish.
Every/each captain > a fish
A fish > every/each captain

d. Lan đưa một vị-thuyền-trưởng mọi/mỗi con-cá.
Lan give one CL-ship-leader every/each CL-fish
Lan gives one captain every/each fish.
One captain > every/each fish
**every/each fish > one captain.*

Examples (15a) and (15b) show the V-DO-IO order while (15c) and (15d) show the V-IO-DO one. Examples (15b) and (15d) offer interesting insights into the positions of DO and IO relative to each other. Given how principle (2) seems to be able to capture scopal interactions between QPs in Vietnamese, we expect scopal relations to mirror hierarchical ones. Specifically, in (15b), the DO is a universal while the IO is an existential. The outcome is an absence of a $\forall > \exists$ reading. (15d) shows an identical scopal situation with the difference being the structure. Again, we notice no wide-scope interpretation for the universal if it is the DO. The lack of wide-scope reading for the universal in both these cases means that the quantifier is structurally lower than the existential. Hence, the position it occupies, the DO, should be low. On the contrary, an analysis that assumes IO is hierarchically lower than DO in either order cannot explain the data presented in (15a-d) as the DO in (15b,d) should then have scope over the IO due to the former c-commanding the latter, contrary to fact.

3.3. Passives

Passive constructions in Vietnamese typically resemble those in Chinese (Huang et al. 2009, Simpson & Ho 2008). Specifically, there is the short passive in which the subject is followed by the passive morpheme *bị/được*, followed by a VP. On the other hand, the long passive differs in that the passive morpheme is followed by a DP which represents the Agent and a VP. Example (16) demonstrates these two types.

(16) a. Tôi bị đánh. (short)
I PSS hit
I was hit.

b. Tôi bị Nam đánh. (long)
I PSS Nam hit
I was hit by Nam.

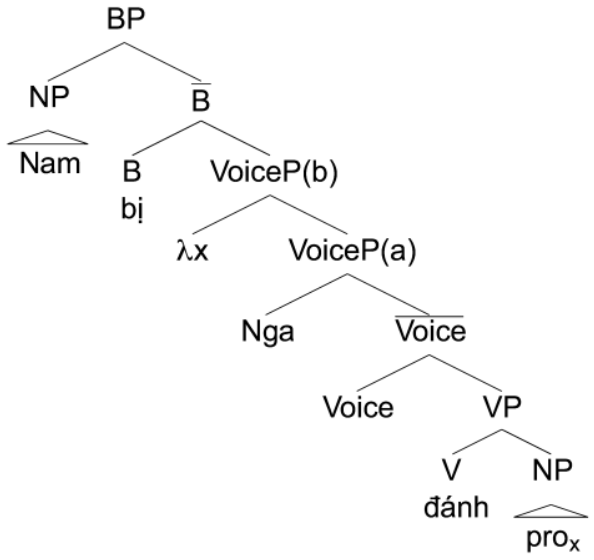
Our main concern here is the long passive, which involves two arguments: the Patient/Theme DP and the Agent DP as this type of passive can contain two QPs, which may shed further light on QP scope in Vietnamese.

There are two possible analyses for the structure of the long passive in Vietnamese. Bruening & Tran (2015) propose the structure (18) for (17), which they term differently as the 'active BI construction'.

(17) Nam bị Nga đánh.
Nam PSS Nga hit
Nam was hit by Nga.

(Bruening & Tran 2015, p.155, ex.91)

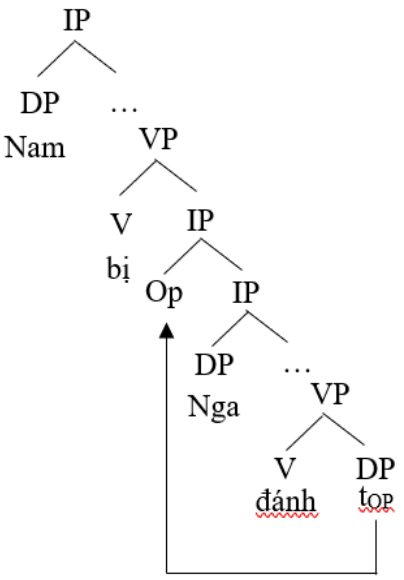
(18)



(Bruening & Tran 2015, p.155, ex.92)

This structure involves no movement. The object of the verb is a *pro* and not a PRO since this is a case-assigned position. Then, the lambda operator adjoined to VoiceP binds *pro*. Additionally, it turns VoiceP into a property that the passive morpheme *bị* in B will predicate of the subject NP in Spec,BP. In short, the meaning of BP is that the property of Nga hitting someone is true of Nam. The other treatment draws on Huang et al.'s (2009) analysis of Chinese long passives in terms of the *tough*-construction.

(19)



A *tough*-construction analysis resembles Bruening & Tran's one in its use of predication. In this case, the relationship between the moved operator and the subject DP is a predicative one. On the other hand, a *tough*-analysis does employ movement, albeit not of the subject DP but of the null operator as the sister of the embedded verb. Data from island-sensitivity seems to favour a *tough*-analysis over Bruening & Tran's.

(20) *Nam bị Nga nhìn-thấy người mà đã đánh.
Nam PSS Nga see person REL PRF hit
*Nam was affected by Nga having seen the person who hit him.

The analysis by Bruening & Tran will have no trouble deriving the meaning of (20). In specific, there will be a *pro* as the object of the verb *đánh*, which will be bound by a lambda operator higher up. As a result the property of Nga having seen the person who hit someone is true of Nam, giving us the meaning in (20). However, (20) is ungrammatical. This can be explained if we adopt the *tough*-analysis as the ill-formedness can be attributed to the movement of the operator out of the complex-NP island *người mà đã đánh* to a higher position. On the other hand, Bruening & Tran's account predicts no ungrammaticality due to the absence of movement. Nonetheless, it is not within the scope of this paper to argue which analysis to adopt. What matters is that in either analysis, the agent DP will be c-commanded by the patient DP. Therefore, according to (2), we expect surface scope readings only, apart from those constructions with the agent NP as an indefinite. This prediction is borne out, as demonstrated in (21).

(21) Một học-sinh bị mỗi/mọi giáo-viên khiển-trách.
One student PSS each/every teacher reprimand

A student was reprimanded by each/every teacher.

'There is a specific student who was reprimanded by each/every teacher.'

**'For each/every teacher, there is a student who was reprimanded by that teacher.'*

In (21), the only reading available is one where the existential assumes wide scope over the universal, not vice versa.

Although I have mentioned that the main concern is the long passive, short passives might still be able to offer insights into quantifier scope if we look at ditransitive short passives.

(22) a. Một quyển-sách đã được đưa (cho) Nam.
One Cl-book PRF PSS give to Nam
A book was given to Nam.

b. Nam đã được đưa (cho) môt quyển-sách.
Nam PRF PSS give to one Cl-book
Nam was given a book.

Examples (22a-b) show that both the DO and IO can be promoted to subject position. The expectation is that the promoted object will always have wide scope over the unpromoted one.

(23) a. Một quyển-sách đã được đưa (cho) mỗi/mọi người-đàn-ông.
One Cl-book PRF PSS give to each/every Cl-man
A book was given to each/every man.
'There is a specific book that was given to each/every man.'
**'For each/every man, he was given a book.'*

b. Mỗi/mọi quyển-sách đã được đưa (cho) một người-đàn-ông.
Each/every Cl-book PRF PSS give to one Cl-man
Each/every book was given to a man.
'For each/every book, it was given to a man.'
'There is a specific man that each/every book was given to.'

c. Mỗi/mọi người-đàn-ông đã được đưa (cho) một quyển-sách.
each/every Cl-man PRF PSS give to one Cl-book
Each/every man was given a book.
'For each/every man, he was given a book.'
'There is a specific book that was given to each/every man.'

d. Một người-đàn-ông đã được đưa (cho) mỗi/mọi quyển-sách.
One Cl-man PRF PSS give to each/every Cl-book
One man was given each/every book.

'There was a specific man who was given each/every book.'

*****'*For each/every book, there was a man who was given it.*'

Example (23a,d) lend support to our prediction as the wide-scope reading of the unpromoted object is unavailable. In (23b,c), the wide-scope reading of the unpromoted object can be attributed to the exceptional-scope property of indefinites as opposed to actual QR, which I have discussed in section 2.1.

Thus, scopal interactions in Vietnamese long passives and ditransitive short passives suggest again the absence of QR as a scope-shifting mechanism.

4 Inverse-linking

In this section, we turn to inverse linking and the potential problem it poses for our analysis. Inverse-linking (henceforth ILC) refers to a configuration where a quantified DP is embedded within another (May 1977), as shown in (24):

(24) a. [$_{DP1}$ A painting of [$_{DP2}$ every king]] was hung on the wall.
b. [$_{DP1}$ Every gate of [$_{DP2}$ a house]] was open.

DP2, despite being structurally lower than DP1, can have semantic scope over it. (24a) and (24b) can have the readings (25a) and (25b) respectively:

(25) a. For every king, there was a painting of him that was hung on the wall.
b. There existed a specific house whose gates were all open.

Vietnamese also has this type of construction, as shown in (26).

(26) Một vị-hiệu-trưởng của mọi trường đã có mặt tại hội-nghị.
One CL-headmaster of every school PST have face at conference
A headmaster of every school was present at the conference. (∀>∃/∃>∀)

Interestingly, ILCs in Vietnamese do allow the inverse reading where the lower QP scopes over the higher one. Furthermore, they allow quantifier binding of a pronoun in the main clause, as demonstrated in (27).

(27) Một vị-hiệu-trưởng của **mọi trường**$_i$ đại-diện cho **nó**$_i$ tại hội-nghị.
One CL-headmaster of every school represent for it at conference
A headmaster of every school represents it at the conference.

This presents a peculiar situation as it seems to suggest that QR is present in Vietnamese and principle (2) is too restrictive. However, I will show later that inverse-linking reading can be generated without resorting to QR.

4.1. Quantifier Raising

May (1977) argues that the salience of such inverse readings lends support to the existence of QR, which is needed for DP2 to achieve wide scope over DP1. To further this claim, May (1985) uses inverse linking sentences with a pronoun which appears bound by DP2, as demonstrated in (28):

(28) [$_{DP1}$ A headmaster of [$_{DP2}$ **every school$_i$**]] represents **it$_i$** at the conference.

He argues that for *it* to be interpreted as bound by DP2, the latter needs to c-command the former, which is not the case at surface structure. As a result, DP2 has to undergo QR at LF to a position adjoined to IP where it can bind the pronoun. Similarly, one can argue that the presence of a reading where the embedded QP *mọi trường* binds the pronoun *nó* (in example (27)) suggests the presence of QR as a scope-shifting mechanism.

However, this proposal has some problems. The first is that such a kind of movement amounts to island violation as the embedding DP constitutes an island environment for extraction. May (1985) remarks that QR should be subjected to island effects similar to wh-movement.

(29) ***Which city$_i$** does someone from **t$_i$** despise it?

In (29), the movement of the wh-phrase *which city* out of the complex DP to Spec,CP causes ungrammaticality. Therefore, we should expect QR, a movement out of DP to an IP-adjoined position, to be blocked. The second problem was first noticed by Larson (1985), and later termed *Larson's Generalization* by May & Bale (2006). Larson observes that in a sentence such as (30), there is no reading where the QP *every linguistic paper* has scope over the subject QP *two students* while the QP *a review* is still in the scope of the subject QP. This is called a 'split-scope' interpretation.

(30) Two students submitted a review of every linguistic paper. (*$\forall > 2 > \exists$)

According to Larson, QR will allow the split-scope reading to be generated through adjoining the universal QP to IP, allowing it wide scope over the subject QP, contrary to fact. Vietnamese sentences with a subject QP and an object ILC also corroborate this observation.

(31) Hai người-đàn-ông mua một quyển-sách của mọi tác-giả.
Two Cl-man buy one Cl-book of every author

Two men bought a book of every author. (*∀ > 2 > ∃/ 2 > ∀ > ∃/ 2 > ∃ > ∀)

Example (31) disallows a reading where the universal has wide scope over the other two QPs, despite it being logically possible. Hence, these two points illustrate the problems with the idea of QR as movement and adjunction to IP.

The third problem is the availability of surface readings. May & Bale (2006) propose that sentences such as (28) can have the surface reading of the ILC: there is a headmaster who is the headmaster of every school. They argue that even for a non-inversely-linked reading, the two QPs still have to undergo QR to IP-adjoined positions for scope interpretation. As a result, we would expect pronominal binding with surface construals as well, contrary to fact. Worse, May (1977) concluded that the surface reading should not be available as the application of QR to both QPs would leave the trace of the embedded QP unbound. Yet, we know that the surface reading of ILCs is fully obtainable.

May (1985) attempts to remedy the issue of DP extraction by restating QR as adjoining QPs to the embedding DP, thereby preventing it from crossing an island boundary. This, nevertheless, creates two new problems. First, a DP-adjunction approach forces a flexible type semantics to be adopted (Heim & Kratzer 1998), as there seems to be no way for ILCs to be derived compositionally without such an assumption. Second, adjoining the QP to the subject DP instead of IP results in the quantifier being structurally not high enough to c-command and bind the pronoun in cases like (27) or (28).

4.2. Zimmerman's approach: Surface interpretation

Zimmerman (2001) notices how the ordering of postnominal modifiers correlates with the availability of the inverse reading.

(32) a. One person who was famous from every city died last year.
b. One person from every city who was famous died last year.
(Zimmerman 2001, p.4, ex.13)

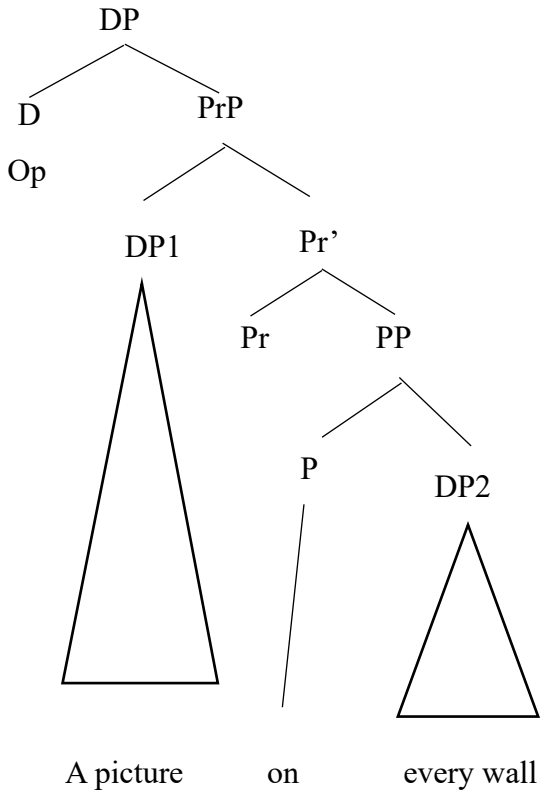
His observation is that the inversely-linked reading is only available in (32a) but not (32b). He argues that ILCs are structurally ambiguous at the surface (see Thoms 2023 for similar ideas). On the one hand, ILCs with the surface reading assume the canonical structure like (33):

(33) $[_{DP}$ A $[_{NP}$ picture $[_{PP}$ of $[_{DP}$ every actor]]]]

On the other hand, ILCs with the inverse reading have an entirely different geometry. The phonetically null head D of the main DP hosts an operator that selects a predicative small clause

PrP. DP1 sits in Spec,PrP and is the subject of the phrase while the head Pr selects the PP which predicates a place of DP2.

(34)



The head P will then combine with Pr to form a complex head whose denotation [[Pr + on]] takes in the denotation of DP1 and that of DP2 before mapping them onto a set of functions with [[DP2]] as the inputs and [[DP1]] as the outputs. The resultant denotation of the PrP is a set of Skolem functions which take in an entity and returns another. (35), drawing on the working in Zimmermann's paper, provides a derivation of (34).

(35) a. [[**Pr+on**]] = $\lambda G_{<et,t>}\lambda R_{<et>}.\lambda f.\ Q(\lambda x.R(f(x)) \wedge on'(f(x),x))$

b. [[**Pr+on every wall**]] = $\lambda R_{<et>}.\lambda f.\forall z[wall'(z) \rightarrow (R(f(z)) \wedge on'(f(z),z))]$

c. [[**a picture Pr+on every wall**]] = $\lambda f.\ \forall z\ [wall'(z) \rightarrow (picture'(f(z)) \wedge on'(f(z),z))]$

(35c) denotes a set of functions mapping a wall to a picture that is on it. The finishing touch is having the operator in D quantify existentially over the denotation of PrP. To combine with a predicate such as *is broken*, Zimmermann proposes that Spec,DP will host a different operator

which, in this case, quantifies over a set of Skolem functions and at the same time attributes a property to the output values of those functions.

(36) a. [[**Op1**]] = $\lambda F_{<ee,t>}\lambda G_{<et>}$. $\exists f[F(f) \wedge \forall x[dom(f)(x) \longrightarrow G(f(x))]$

b. [[**Op1**]]([[**PrP**]]) = $\lambda G_{<et>}$. $\exists f[\forall z$ [wall'(z) → (picture'(f(z)) ∧ on'(f(z),z))]
∧ $\forall x[dom(f)(x) \longrightarrow G(f(x))]$

c. [[**DP**]]([[**VP**]]) = $\exists f[\forall z$ [wall'(z) → (picture'(f(z)) ∧ on'(f(z),z))]
∧ $\forall x[dom(f)(x) \longrightarrow$ broken'(f(x))]

d. A picture on every wall is broken.

(36a-c) demonstrates the compositional derivation of (36d). An obvious advantage of this analysis is that it does not resort to movement of the embedded DP. By eschewing covert movement, the approach might contribute to a unified treatment of QPs in Vietnamese, being that they do not undergo QR at LF.

A second advantage of this analysis is its ability to account for the pronominally bound reading in inverse linking sentences, like (37):

(37) A worker from every **company$_i$** sues **it$_i$**.

According to Zimmermann, the head D of the subject DP would now host a different operator that, besides existentially quantifying over [[**PrP**]], attributes a relation R to the input and output values of the Skolem functions.

(38) a. [[**Op2**]] = $\lambda F_{<ee,t>}\lambda G_{<e,et>}$. $\exists f[F(f) \wedge \forall x[dom(f)(x) \longrightarrow G(f(x))(x)]$

b. [[**Op2**]]([[**PrP**]]) = $\lambda G_{<e,et>}$. $\exists f[\forall z$ [company'(z) → (worker'(f(z)) ∧ from'(f(z),z))]
∧ $\forall x[dom(f)(x) \longrightarrow G(f(x))(x)]$

c. [[**DP**]]([[**VP**]]) = $\exists f[\forall z$ [company'(z) → (worker'(f(z)) ∧ from'(f(z),z))]
∧ $\forall x[dom(f)(x) \longrightarrow$ sue'(f(x),x)]

(38c) means that there is a function that maps every company to a worker from it and for every company, the worker from that company sues it. In this way, we can still get the interpretation in which the pronoun appears bound without having to move the embedded DP to a c-commanding position.

In spite of the strengths of Zimmermann's analysis, it is not without limitations. The first one is its inability to account for ILCs with PP-complements, such as (39):

(39) [$_{DP}$ A [$_{NP}$ criticism [$_{PP}$ of [$_{DP}$ every argument]]]]

Since the PP *of every argument* is the complement of the head N *criticism*, the latter selects the former, which will have to be base generated as the complement of N. This is a problem for Zimmermann's analysis as the PP in ILCs with the inverse reading is base generated in a small clause structure. Either a third structure will have to be proposed for ILCs with PP-complements or the complex structure for inverse ILCs has to be revised, both of which make the analysis more complicated than it already is. This is a serious drawback as Vietnamese does allow ILCs with PP-complement.

(40) a. Một người-ủng-hộ của mọi đội-bóng
One Cl-support of every team-ball
A supporter of every football team
'one specific supporter who supports every football team'
'a different support of every football team'
b. Một con-đường tới mọi thành-phố
One Cl-road to every city
A road to every city
'One specific road which leads to every city'
'A different road to different cities'

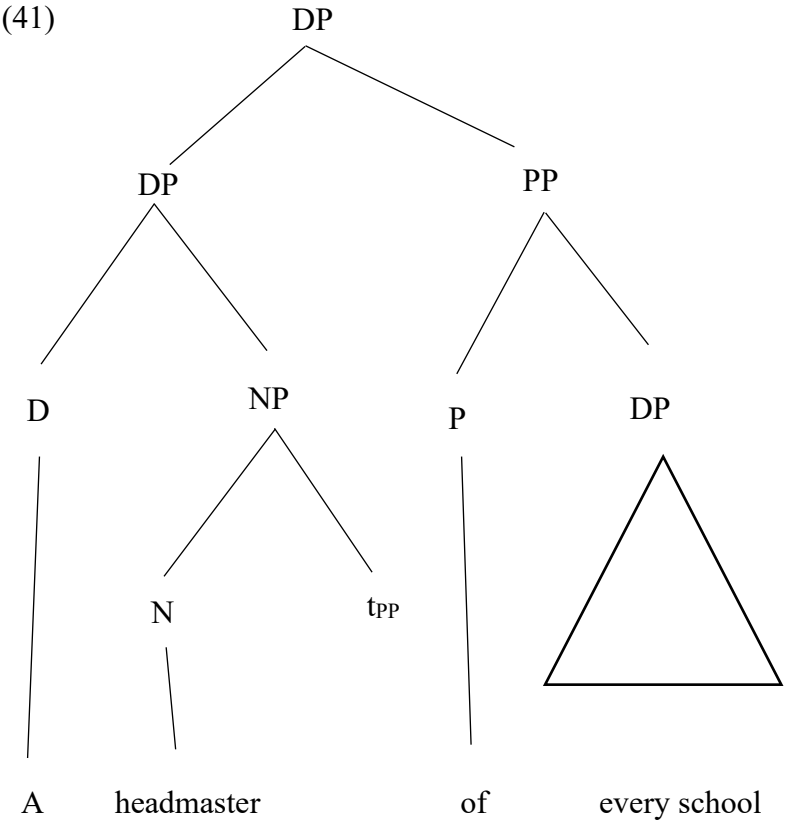
Examples (40a-b) show ILCs with PP-complement, which both exhibit inversely-linked construals apart from surface ones.

Another limitation concerns the status of the null operator in D. The explanation requires different operators for different structures. For sentences with a simple predicate, there is an operator that attributes a property to the denotation of the subject DP while another operator attributes a certain relation to the inputs and outputs of the Skolem functions in sentences with pronominal binding. It seems a large amount of work is assigned to these operators, besides having to existentially quantify over the PrP. In addition, it is strangely convenient that there are a range of operators, each of which is 'designed' to do specific tasks and can only do exactly those tasks. Meanwhile, there is yet no morphological evidence for the existence of such operators in ILCs. Therefore, the heavy number of theoretical stipulations renders the analysis overly descriptive.

4.3. Thoms's extraposition approach

Another approach to ILCs assumes an interestingly different view on inverse linking. Particularly, Thoms (2023) suggests that the inverse reading is obtained through extraposition of the PP to a position right-adjoined to the embedding DP. (41) shows the ILC in (28) with the PP extraposed.

(41)



The motivation behind this proposal hinges on Thoms's observations of scopal interactions in inverse linking sentences with multiple modifying PPs.

(42) a. I read a review of every foreign fable. (∀>∃, ∃>∀)
b. I read a review of every foreign fable by Tom. (*∀>∃, ∃>∀)
c. I read a review by Tom of every foreign fable. (∀>∃, ∃>∀)

Thoms argues that in examples like (42b), the PP *of every foreign fable* is situated lower than the PP *by Tom* and the embedding DP *a review…*, making the inverse reading impossible to get. In sentences like (42c), nonetheless, the PP *of every foreign fable* has undergone extraposition to a higher position at the edge of the embedding DP, thus allowing for the inverse interpretation. The same line of reasoning is applied to (42a) where the inverse reading is produced by PP extraposition. However, as there is no intervening material like in (42c), we are unable to see whether the PP has moved or not. The English observations in (42) carry over to Vietnamese, as demonstrated in (43).

(43) a. Tôi đã gặp một người-hâm-mộ của mọi diễn-viên Trung-Quốc.
I PST meet one Cl-admire of every actor China
I met a fan of every Chinese actor. (∀>∃, ∃>∀)

b. Tôi đã gặp một người-hâm-mộ của mọi diễn-viên Trung-Quốc từ Việt-Nam.
I PST meet one Cl-admire of every actor China from Vietnam
I met a fan of every Chinese actor from Vietnam. (*∀>∃, ∃>∀)

c. Tôi đã gặp một người-hâm-mộ từ Việt-Nam của mọi diễn-viên Trung-Quốc.
I PST meet one Cl-admire from Vietnam of every actor China
I met a fan from Vietnam of every Chinese actor. (∀>∃, ∃>∀)

Thoms's approach, unlike Zimmerman's, can be applied to both ILCs with PP-adjuncts and those with PP-complements. However, it is not QR-free as Thoms does consider the possibility that the extraposed position acts an escape hatch for the embedded QP to undergo QR. If so, it suffers from the same disadvantages of a QR-analysis discussed in section 4.1.

5 A surface interpretation analysis

In this section, I propose an analysis that draws on both Keenan's (2012, 2016) treatment of quantifiers and Thoms' extraposition approach.[1]

Keenan (2012, 2016) proposes that quantified DPs are of a rich type <**Pn+1**, **Pn**>, where n is the number of arguments the predicate takes. For instance, they can map P1 to P0, which is effectively <e,t> to <t>. In this instance, they resemble the type of quantifiers that we all know, <et,t>. Nevertheless, they can also be of type <P2, P1>, meaning they combine with transitive verbs and yield a VP denotation. Keenan also proposes a definition as follows.

(44) $F(H)(b_n)...(b_1) = F(\lambda x.(H(x)(bn)...(b1)))$ all $b_1,...,b_n \in E$ (Keenan 2012, p.97)

This formula allows quantifiers to combine in-situ with the verb. H is a function with a **Pn+1** denotation, taking an n+1 number of arguments (b) of type <e>, while F is the function that takes H and yields a function of **Pn** denotation. The function F on the left-hand side denotes the quantifier which can assume complex types. H is a function mapping n+1 arguments to a truth value. The function F on the right-hand side is the basic form of the left-hand-side one of type <et,t>. (44) tells us that F(H) is a function mapping n arguments (b1 to bn) to a truth value and it is true if $F(\lambda x.(H(x)(bn)...(b1)))$ is true. To generate surface scope readings of sentences with object QPs, one does not need QR to resolve type mismatch. A doubly-quantified sentence, furthermore, can be interpreted without any QR.

(45) a. Some teacher reads every book.
b. (**every** (**book**))(**reads**) = (**every** (**book**)) (**reads**))

[1] This analysis was developed through multiple detailed discussions between me and Klaus Abels.

= (**every** (**book**))(λx.λz.(**read**)(x)(z))

= λz.∀x[**book**(x) ⟶ **read**(x)(z)]

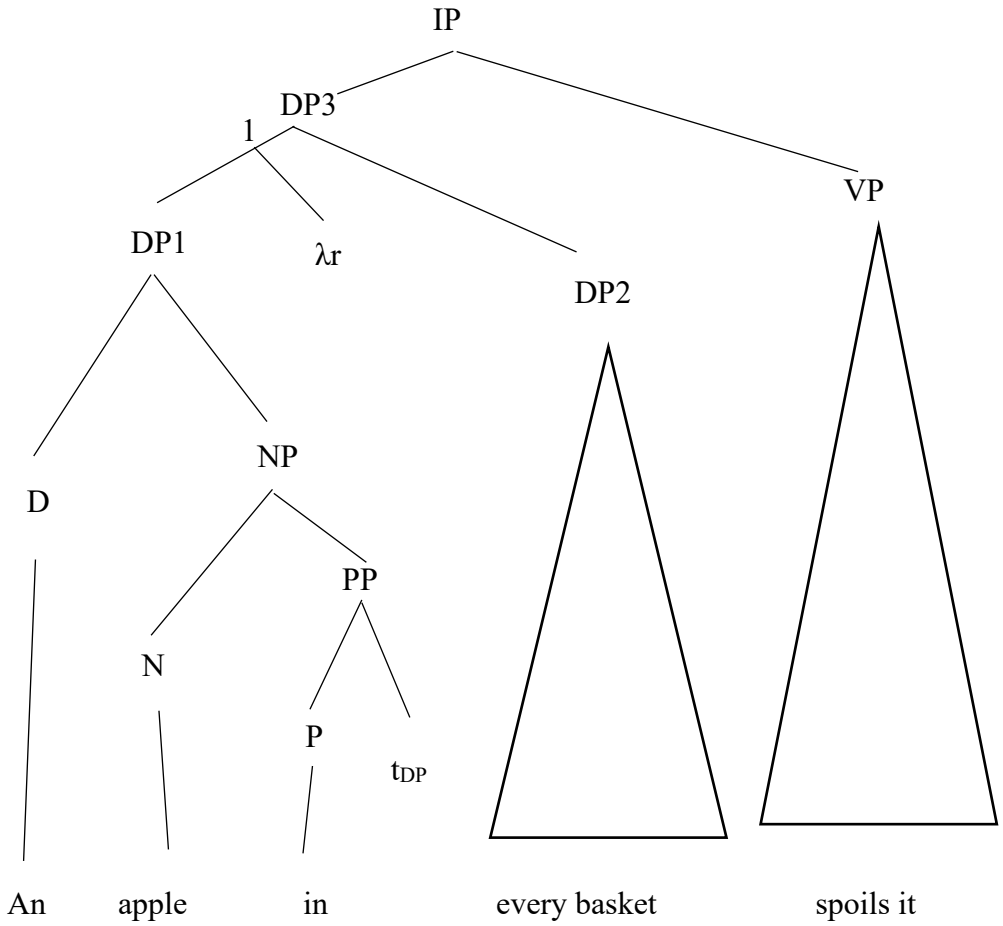
c. (**some** (**teacher**))((**every** (**book**))(**reads**)) = (**some** (**teacher**))(λz.∀x[**book**(x)⟶ **read**(x)(z)]

= ∃y[**teacher**(y)](λz.∀x[**book**(x) ⟶ **read**(x)(z)]

= ∃y[**teacher**(y) ∧ ∀x[**book**(x) ⟶ **read**(x)(y)]

Example (45) demonstrates the derivation of (45a) using Keenan's in-situ approach. Hence, we can now capture the surface scope readings in Vietnamese without resorting to QR for interpretation. In addition to surface scope, we can extend Keenan's approach to capture inverse-linking readings. First, drawing on May (1985) and Thoms (2023), I propose that in Vietnamese ILCs, the embedded DP undergoes extraposition to the edge of the embedding DP to create the syntactic condition for the 'inversely-linked' reading as shown in (46), which is effectively a surface reading according to the structure.

(46)



Obviously, (43) shows the evidence of the whole PP instead of only the DP being extraposed in Vietnamese. Nonetheless, moving the PP will create further complications for the derivation. Thus, for ease of exposition and reasons of space, I will assume that it is only the DP that is extraposed. The problem of extraposed PP can be dealt with in another paper. For the semantic derivation, Keenan's system has to be extended so that it works for not just predicates but any expression of a type ending in <t>. Specifically, as proposed by Klaus Abels (pers. comm.), quantified determiners can be treated as of type <<et>, <eτ,τ>>, where τ is a type ending with <t>. Hence, <et> is type τ , <et,t> is type τ, <e,et> is type τ, and so on. QPs will be of type <eτ,τ>. This allows QPs to combine with any expression of a type ending with <t> and beginning with <e>, not just predicates. The new formula will resemble Keenan's original one in (44).[2]

(47) $Q(G)(b_n)...(b_1) = Q(\lambda x.(G(x)(bn)...(b1)))$ all $b_1 \in E$, $b_2,...,b_n$ is of any type

On the left, Q is our quantifier with a general denotation of type <eτ,τ> while G is a function of type <eτ>, mapping an individual (b1) and a number of arguments (b2…bn) to a truth value. On the right, Q is a basic denotation of the general Q on the left-hand side, being of type <et,t>. Q(G), of type <τ>, is true when Q(λx.(G(x)(bn)...(b1))) is true. Now we can derive the meaning of (48).

(48) a. [[**PP**]] = λx. x is in z

b. [[**NP**]] = λw. apple(w) ∧ w is in z

c. [[**DP1**]] = $\lambda f \in D_{<et>}$. ∃t[apple(t) ∧ t is in z ∧ f(t)]

d. [[**1**]] = $\lambda r.\ \lambda f \in D_{<et>}$. ∃t[apple(t) ∧ t is in r ∧ f(t)]

e. [[**DP2**]] = $\lambda f \in D_{<e,<et,t>>}$. $\lambda g \in D_{<et>}$.∀s[basket(s) ⟶ f(s)(g)=1]

f. [[**DP3**]] = [[**DP2**]]([[**1**]]) = $\lambda g \in D_{<et>}$. ∀s[basket(s) ⟶ ∃t[apple(t) ∧ t is in s ∧ f(t)]

g. [[**VP**]] = λp. p spoils v.

h. [[**IP**]] = [[**DP3**]]([[**VP**]]) = ∀s[basket(s) ⟶ ∃t[apple(t) ∧ t is in s ∧ spoils(s)(t)]

We can see that using this surface interpretation method, an ILC can be interpreted with the extraposed DP having wide scope over the embedding one, hence creating the inversely-linked reading. Moreover, this analysis can also generate the pronominally bound reading without placing the embedded DP at a higher position, as demonstrated in (48f-h). In particular, the denotation of DP3 in (48f) shows that the denotation of the VP *f(t)* will be in the scope of the

[2] It was only after having completed this thesis and the ensuing viva exam that I was aware that Büring (2004) had already proposed a similar analysis. The only difference is the addition of the κ-operator that has the function of mapping the left-hand side of (47) to the right-hand side and his treatment of pronouns as E-type.

universal operator. (48g) is the denotation of the VP with the free variable v. Once we do Function Application, *f(t)* is replaced with the denotation of VP, causing the free variable to be in the scope of the universal operator and thus bound by it. In the end, we have a system that can derive inversely-linked readings, surface readings, and pronominally-bound readings without requiring QR, flexible types, or extra structures.

6 Conclusion

To conclude, I have argued that QR is not needed for either scope interpretation or scope shifting in Vietnamese. One reason is that inverse scope is not available in Vietnamese, thus removing the need for any scope-shifting mechanism. Another one is that surface-scope construals can be derived through a Keenan-style system, thus neutralising the requirement of QR for interpreting scope.

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