Thai Quantifier Float as Quantifier Raising

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GLOW in Asia 8
Beijing, China
August 2010
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The Phenomenon

- Q-float in Thai:

(1) นักเรียนสามคน [VP สามคน แล้ว] นักเรียน 3-CL person  read book  already

'Three students read a book already.'
The Phenomenon

• Q-float in Thai:

(1) **nák.riian** [vp ?aan nàŋsǔu leéw ] sǎam-khon
student read book already 3-cl\(_{\text{person}}\)
‘Three students read a book already.’
Questions

Questions for an analysis of Thai Q-float

1. What is the structural position of the FQ?
2. Only quantifiers float — what makes them special in that regard?
3. Is Q-float base-generated or is movement involved?
The answers to these questions connect Q-float to QR.

1. Subject and object FQs are right-adjointed to the clausal spine.
2. Quantifiers need to have scope in certain positions; Q-float affects scope.
3. Q-float is subject to locality constraints, implicating movement.
Sketch of the analysis

- The claim: Thai Q-float is an overt instance of QR.

\[(2) \quad a. \quad \text{nák.riian} \ [VP \ ?aan \ nàŋsûm \ mûñawaammí] \ sãam-khon\]
\[\text{student} \quad \text{read} \quad \text{book} \quad \text{yesterday} \quad 3-\text{CL}^\text{person}\]
\[\text{‘Three students read a book yesterday.’}\]

- A further claim: Q-float is DP movement where a chain is spelled out in two different positions.

- This argues for syntactic theories of scope inversion, i.e., the existence of QR more generally.
Basics of Thai structure

- Thai is an analytic language with isolating morphology:

  (3)  phûuak dèk khəy duu nǎŋ waan-níí
        PL   child PRF   watch movie day-this
  ‘The children have watched a movie today.’

- Rigid S-V-O-Adv word order.
- No inflectional morphology: Thai lacks obligatory tense or agreement on verbs or number on nouns.
- Bare nouns can appear as arguments.
Thai as a classifier language

- Distributive quantifiers require a numeral classifier:

(4) a. khruu 3-khon teacher 3-CL_{person} ‘(the) three teachers’

b. khruu thúk-khon teacher every-CL_{person} ‘every teacher’

- Thai DPs have the order N-Num-Clf, which is obligatory. Several proposals derive this order by NP movement (Simpson, 2005; Singhapreecha, 2001; Visonyanggoon, 2000).
Quantifiers float from subjects and objects

- The ability of Thai quantifiers to “float” to the right edge of the sentence is possible for both subjects (5) and objects (6).

(5) a. นักเรียน สามคน [VP สามคน] นักเรียน สามคน
      student  3-CL{person}  read  book  yesterday

     b. นักเรียน [VP สามคน] นักเรียน สามคน
      student  3-CL{person}  read  book  yesterday
      (both) ‘Three students read a book yesterday.’

(6) a. นักเรียน [VP สามคน] นักเรียน สามคน
      student  3-CL{volume}  already

     b. นักเรียน [VP สามคน] นักเรียน สามคน
      student  3-CL{volume}  already
      (both) ‘The students have already read every book/two books.’
The quantifiers that float

- Quantifiers which do not require a classifier, such as ทั้งหมด ‘all’, can also float.

(7) a. นักเรียนทั้งหมด [VP ผาน เขียน หนังสือ แล้ว]  
    student all-EXT read book already

b. นักเรียน [VP ผาน เขียน หนังสือ แล้ว] ทั้งหมด  
    student read book already all-EXT
    (both) ‘All the students read a book yesterday.’
The special status of Q-float

- Simpson (2004) suggests that Q-float in Thai is a form of extraposition.
- But Thai does not have relative clause extraposition:

\[(8) \begin{align*}
\text{a. } & \quad [\text{DP dèk } [\text{CP thïi phûut thai dâi }] ] \text{ gàb bân dâi.léew} \\
& \quad \text{child REL speak Thai can return home already}
\end{align*}
\begin{align*}
& \quad \text{‘The child that can speak Thai already went back home.}
\end{align*}
\begin{align*}
\text{b. } & \quad *[\text{DP dèk }] \text{ gàb bân dâi.léew } [\text{CP thïi phûut thai dâi }]
\end{align*}
\begin{align*}
& \quad \text{child return home already REL speak Thai can}
\end{align*}
\]

- Extraposition from objects and the extraposition of other modifiers, such as PPs, is impossible as well.
- **Conclusion**: Q-float is not part of a more general phenomenon of rightward movement.
Locality constraints on Q-float

- Previous work on Thai Q-float has shown that it is subject to locality constraints (Simpson, 2004): it is limited to argument NPs.
- Possessives NPs in Thai follow the preposition *kh∅on* ‘of, belonging to.’

(9) a. Pong c`a [VP h`ay [DP nɔːŋs`u kh∅on [DP d`ēk 2-khon ]] k`ap N`at ]
Pong will give book POSS child 2-CL_{person} to Nat
‘Pong will give the two children’s book to Nat.’

b. *Pong c`a [VP h`ay [DP nɔːŋs`u kh∅on [DP d`ēk ]] k`ap N`at ] 2-khon
Pong will give book POSS child to Nat 2-CL_{person}

- The same is true for NP complements and NPs within relative clauses.
- These locality constraints implicate movement, which cannot cross multiple phase (e.g. DP) boundaries.
Quantifier float and scope

- Q-float in Thai affects the scope of the FQ relative to negation:
  - Q-float lowers the scope of subject quantifiers.
  - Q-float raises the scope of object quantifiers.
The scope of subject FQs

- **Q-float lowers the scope of subject quantifiers.**
- **We can see this with the quantifier sák ‘even one,’ an NPI.**
- **NPIs must be c-commanded by negation.**

(10)  

a. *Paacaan sák-khon yaŋ mái [VP tii nák.riian ]
   teacher even.one-CL person still NEG hit student
   ‘Not even one teacher has hit a student.’ (intended)

b. Paacaan yaŋ mái [VP tii [DP nák.riian sák-khon person ]]
   teacher still NEG hit student even.one-CL person
   ‘Teachers haven’t hit even one student’

- **Sák** cannot quantify over subjects, above negation (10a).
- **Yet sák** can quantify over objects, inside of a negated VP (10b).

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NPIs as subject FQs

- As an NPI, *sák* can be used as a diagnostic for the structural position of FQs relative to negation.

\[(11) \text{ a. } \text{Nák.riian sák-khon yañ mâi [VP kin khâaw ] student even.one-CL^person still NEG eat rice}
\]
- ‘Not even one student has eaten.’ (Intended)

\[(11) \text{ b. } \text{Nák.riian yañ mâi [VP kin khâaw ] sák-khon student still NEG eat rice even.one-CL^person}
\]
- ‘Not even one student has eaten.’

- (11b) shows *sák* can occur as an FQ, even if associated with a subject.
- **Conclusion**: Subject FQs are structurally lower than subjects, and can be c-commanded by negation.
Further evidence

- **Conclusion**: Subject FQs are structurally lower than subjects, and can be c-commanded by negation.

- **Floated vs. in-situ universal quantifiers and negation**

  (12)  
  a. \( \text{Nák.riian thûk-khon (yâŋ) mái [VP kin khâaw ]} \)  
  \text{student every-CL^person still NEG eat rice}  
  ‘Every student still hasn’t eaten.’  
  \( \forall > \neg, *\neg > \forall \)

  b. \( \text{Nák.riian (yâŋ) mái [VP kin khâaw ] thûk-khon} \)  
  \text{student still NEG eat rice every-CL^person}  
  ‘Every student still hasn’t eaten.’  
  \( \forall > \neg, \neg > \forall \)

- Once again, Q-float serves to narrow the scope of the subject quantifier.
The scope of object FQs

- While Q-float can lower the scope of subject quantifiers, it can raise the scope of object quantifiers.
- Quantifiers in object position must scope below negation, while a floated object quantifier can scope above negation.

(13) a. Joe mái [VP phóp nákriian thúk-khon] mûñawaamníi
  Joe NEG meet student every-CL\textsubscript{person} yesterday
  ‘Joe didn’t meet all of the students yesterday’

  *∀ > ¬, ¬ > ∀

  b. Joe mái [VP phóp nákriian] mûñawaamníi thúk-khon
  Joe NEG meet student yesterday every-CL\textsubscript{person}
  ‘Joe didn’t meet all of the students yesterday’

  ∀ > ¬, ¬ > ∀

- Conclusion: Object FQs are structurally higher than objects, and can c-command negation.
Summary of scope facts

- Q-floating affects the scope of FQs relative to negation by
  1. permitting a narrower interpretation for subject Qs.
  2. permitting a wider interpretation for object Qs.

(14)

<table>
<thead>
<tr>
<th>Type</th>
<th>Scope Expression</th>
<th>Negation</th>
<th>Universal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject-Q</td>
<td>NP-∀ ... ¬ ...</td>
<td></td>
<td>×</td>
</tr>
<tr>
<td>Subject-FQ</td>
<td>NP ... ¬ ... ∀</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Object-Q</td>
<td>... ¬ ... NP-∀ ...</td>
<td></td>
<td>×</td>
</tr>
<tr>
<td>Object-FQ</td>
<td>... ¬ ... NP ... ∀</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- The scopal effects are different with multiple quantifiers, but we will not have time for these today.
Overview of the analysis

- The analysis consists of five main ingredients:
  1. A theory of quantifier raising/lowering.
  2. A theory of left vs. right specifiers.
  3. A principle requiring that scope be transparently reflected in the syntax (Bobaljik and Wurmbrand, 2008).
  4. A principle requiring that nouns be pronounced in their case positions in analytic languages.
  5. A constraint on the distribution of discontinuous DPs.

- Some of these have been proposed before, some must be modified, and (4) is completely new.
Johnson and Tomioka (cf. 1997) argue that QR consists of movement/reconstruction to the $vP$ field.

1. Object quantifiers raise to a projection above the subject trace.
2. Subject quantifiers reconstruct/lower to a position below objects.

\[(15)\]
QR and adjunction

• Most analyses of QR propose that these scope positions of quantifiers are clausal adjuncts.
• However, adjuncts in Thai are on the right:

\[(16)\]

```
TP
  /
 /    
/     
DP    vP
|     /
|    /  
|   /   
| /    
|/     
some boy       every girl
```

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Q-float as right adjunction

- Because quantifiers are on the right in Thai, they could be attached to one of any positions:

(17)

```
(17)  
    CP
   / 
  CP  FQ
 /     
C     TP
|      / 
|     TP  FQ
|     /   
|    T    VP
|   /     
|  VP      FQ
| /       
V NP
```
Recall that FQs can be c-commanded by negation, which is represented as adjunction to vP, below NegP:

(18)  

a. Nák.riian (yaŋ) mái [vP kin khāaw] sák-khon  
student still NEG eat rice even.one-CLperson  
‘Not even one student has eaten.’

b. 

\[
\text{TP} \\
\text{NP}_1 \quad \text{T'} \\
\quad \text{nák.riian} \\
\quad \text{T} \\
\quad \text{NegP} \\
\quad \text{Neg} \quad \text{vP} \\
\quad \text{mái} \\
\quad \text{vP} \quad \text{VP} \\
\quad \text{kin khāaw} \\
\quad \text{QP}_1 \\
\quad \text{t}_1 \text{sák-khon}
\]
Ambiguity relative to negation

- The different scope readings available for FQs are due to different positions available to negation (Visonyanggoon, 2000, §5.5):

\[(19) \quad \text{a. } Q > \text{Neg} \quad \text{b. } \text{Neg} > Q\]
Right adjunction and adverbs

- Evidence from adverbs also supports right-adjunction.
- While FQs cannot occur to the left of manner adverbs:

\[
\begin{align*}
(20) \quad & \text{a. nák.riian [ ʔaan nàŋsūŋ ] rew-rew 2-khon} \\
& \text{student read book quickly 2-CL\text{\textsuperscript{person}}} \\
& \text{‘Two students read the book quickly.’} \\
& \text{b. *nák.riian [ ʔaan nàŋsūŋ ] 2-khon rew-rew} \\
& \text{student read book 2-CL\text{\textsuperscript{person}} quickly}
\end{align*}
\]

- FQs can order freely with higher adverbs such as temporal adverbs:

\[
\begin{align*}
(21) \quad & \text{a. nák.riian [ ʔaan nàŋsūŋ ] mûŋawaanníi 2-khon} \\
& \text{student read book yesterday 2-CL\text{\textsuperscript{person}}} \\
& \text{b. nák.riian [ ʔaan nàŋsūŋ ] 2-khon mûŋawaanníi} \\
& \text{student read book 2-CL\text{\textsuperscript{person}} yesterday} \\
& \text{(both)‘Two students read the book yesterday.’}
\end{align*}
\]

- These facts indicate that FQs can attach above VP and below TP.
Complications

- Two remaining issues for an analysis of Q-float as rightward QR:
  - **Problem 1** Why is movement/adjunction to the right in this case?
  - **Problem 2** QR involves movement of the whole DP, but Q-float only involves overt movement of the Q-Clf constituent.
Excursus on right-adjunction

- Assume a theory where specifiers and adjuncts are the same thing (Kayne, 1994), but multiple specifiers are allowed (Chomsky, 1995; Ura, 1996).

- Modifying the approach of Fox and Pesetsky (2009), suppose that specifiers can be linearized on the right or the left in SVO languages, determined by specific syntactic factors:

  - **Specifiers on the left:**
    - Fully valued features and
    - Selected by the projecting head
  
  - **Specifiers on the right:**
    - Unvalued features or
    - Not selected by the projecting head
Excursus on right-adjunction

Specifiers on the left: 1) Fully valued features and 2) selected by the projecting head.

Selected by C, valued wh feature $\Rightarrow$

Selected by T, valued case feature $\Rightarrow$
Excursus on right-adjunction

**Specifiers on the right:** 1) Unvalued features or 2) not selected by the projecting head.

```
TP
   /\      PP
  /   \    \
  TP   vP  ⇐ Temporal adjunct, unselected by T
     /\    \
    vP DP_{uk}  ⇐ Subject trace, unvalued case feature
       \   \n       v   ...
```
Subject Q-float

- This allows us to maintain a view of subject Q-float where the FQ is simply the vP-internal position of the subject (Sportiche, 1988):

- The fact that the FQ marks the predicate-internal subject position accounts for the scope-lowering effect of Q-float.
The bipartite structure of quantification

• Quantifiers take two arguments, a restrictor and a scope.

(22)  a. All dogs are mammals.
     b. \( \text{all} = \lambda P \lambda Q \forall x (P(x) \to Q(x)) \)
     c. \( \forall x (D(x) \to M(x)) \)

• In the example above, dogs is the restrictor of all and are mammals is its scope.

• Quantificational determiners such as ‘all’ combine with their restrictor argument before their scope argument.
Q[float as DP movement

• As FQs are interpreted in their floated position, their host noun must be interpreted there as well.
• This means that Q-float should be represented as DP-movement.

(23) *[\text{VP klæb båan}] \text{nák.riian thúk-khon}
return home student every-CL\text{person}

• But (23) shows that the noun cannot appear there.
• Proposal: While (23b) is the correct derivation, principles of chain pronunciation conspire to produce a discontinuous DP at PF.
Pronouncing Q-float

- Assuming the copy theory of movement, suppose the following two principles govern the pronunciation of chains:
  
  **Scope Transparency** Pronounce scopal elements where they are interpreted (cf. Bobaljik and Wurmbrand, 2008).
  
  **Analytic NP Principle** Pronounce nouns in their case (feature-valued) position.
Scope Transparency and the 3/4 signature

- Scope Transparency (my version)
  Pronounce scopal elements where they are interpreted.
- This accounts for the rigid scope of subject and object quantifiers.

(24) a. Joe mái [VP phóp nákriian thúk-khon] mûuawaanníi
    Joe NEG meet student every-CL\textsubscript{person} yesterday
    ‘Joe didn’t meet all of the students yesterday’

b. Joe mái [VP phóp nákriian] mûuawaanníi thúk-khon
    Joe NEG meet student yesterday every-CL\textsubscript{person}
    ‘Joe didn’t meet all of the students yesterday’

- (24a): *∀ > ¬, ¬ > ∀, so the lower copy is pronounced.
- (24b): ∀ > ¬, ¬ > ∀, so the higher copy is pronounced (recall that the position of negation is variable).
- Connection: Hasegawa (1993) observes that FQs in Japanese have fixed scope, a possible extension for this approach.
Pronouncing the Noun

- The noun in Thai can always be pronounced in its case position. I propose this is a general property of SVO languages without case or agreement morphology:

  **Analytic NP Principle** If the syntactic role of an NP is not indicated by case or agreement morphology, then NPs must be pronounced in their case position.
More on the Analytic NP Principle

- This principle may account for why many analytic SVO languages share the following properties:
  1. Rigid word order
  2. Wh-in-situ
  3. Resumptive pronouns in relative clauses
  4. Subject and object pro-drop (i.e. Topic-drop, Huang 1984)

- The last point is derived from the fact that the position of the noun is always predictable, hence, it can be omitted.
Deriving Q-float

- The conflicting requirements of Scope Transparency and the Analytic NP Principle conspire to produce Q-float, which is actually DP movement:

\[
\begin{array}{c}
\text{vP} \\
\text{vP} \\
v \quad \text{VP} \\
v \quad \text{QP} \\
V \\
\text{QP} \\
dek \; thuk \; khon
dek \; thuk \; khon
\end{array}
\]

- Scope Transparency is only concerned with the “scope-marking element,” here, the quantifier.
Now it turns out that Q-float is actually quite common in classifier languages. In fact, we always find it in certain classifier languages, as stated by the following generalization:

(25) **Quantifier-Classifier Float Generalization** (Jenks, 2010)
If a classifier language allows the DP-internal order Noun-Number-Classifier, then the Number-Classifier constituent can float.

Ongoing work has found that this generalization is exceptionless: Khmer, Kayah Li, and Thai (all SVO), Burmese, Japanese, Korean, Lisu, and Yi (all SOV) all have quantifier float and have Noun-Number-Classifier as their DP-order.

In every case, this “float” is to the right.
Accounting for the Q-Clf Float Generalization

(26) **Quantifier-Classifier Float Generalization**
If a classifier language allows the DP-internal order Noun-Number-Classifier, then the Number-Classifier constituent can float.

- If DP is a spell-out domain, the following constraint on spell-out can account for the generalization:

(27) **Order Preservation**
If \( \alpha \) precedes \( \beta \), where \( \alpha, \beta \) are only in the spell-out domain of phase \( \phi \), then \( \alpha \) must precede \( \beta \) throughout the derivation.

- In the case of Q-float, since N precedes Q-Clf internal to the DP, which I assume is a phase, then N and Q-Clf can be spelled out discontinuously just in case N still precedes Q-Clf.
Summary

- Q-float in Thai DP is movement motivated for scope reasons.
- This movement is Quantifier Raising (QR), explaining why it is restricted to quantifiers.
- The discontinuity of the DP in Q-float is due to conflicting requirements on chain pronunciation at PF.
- One of these requirements is the Analytic NP Principle, accounting for the absence overt dislocation phenomena in analytic languages.
References I


Fox, Danny, and David Pesetsky. 2009. Rightward movement, covert movement, and cyclic linearization. Class handout, MIT.


