Accounting for a Generalization about Quantifier Float and Word Order in Classifier Languages

Peter Jenks
University of California, Berkeley

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1 Introduction

- Quantifier float is common in many Southeast Asian languages, e.g., Thai:

(1) a. *[Nák.riian **thúk-khon]* *aan* *nǎŋsɯ̌ɯ*
student every-cl^{person} read book
b. *[Nák.riian] aan nǎŋsɯ̌ɯ **thúk-khon***
student read book every-cl^{person}
(both) 'All the students read a book.'

- In this paper I show that the typological distribution of quantifier float is predictable:

(2) **Quantifier Float Generalization**
Rightward quantifier float (of the *Q/Num-Clf*) is only attested in classifier languages which allow the DP-internal order N-Q/Num-Clf (N-Q).

- This observation holds up across distinct families in East and Southeast Asia.
- The split reflects a east (Vietnam and SE China) vs. west (Thailand, Cambodia, Laos, Burma) areal difference in the nominal syntax of mainland SEA languages.
- I reject two possible explanations for (2):
Diachrony Both N-Q order and rightward Q-float are due to shifts towards head-finality.
Stranding Q-float is due to leftward movement of the noun within and out of the noun phrase (cf. Miyagawa 1989; Sportiche 1988).
- The explanation proposed in this paper:
1. Q-float is an instance of focalization (focus marking).
2. Focused material occurs on the right (a universal), subject to syntactic constraints.
3. Rightward displacement is order preserving.

2 Quantifier Float

- I will be working with the following definition of Q-float:

(3) *Quantifier Float*
The ability for adnominal quantifiers to shift from a adnominal position to an adverbial position with only scopal effects on meaning.

- Quantifier float (Q-float) has been extensively studied in European languages, particularly English (e.g Maling 1976; Dowty and Brodie 1984) and French (e.g. Kayne 1975; Sportiche 1988):

(4) a. All the children have seen this movie.
b. The children have all seen this movie.

- While English only allows Q-float from subjects, Q-float in French applies from both subject (5) and object (6) position:

(5) a. *Tous les enfants ont vu ce film.*
all the children have seen this movie
b. *Les enfants ont tous vu ce film.*
the children have all seen this movie
(both) 'All the children have seen this movie.'

(6) *Elle a tous voulu les lire.*
she has all wanted them to-read
'She wanted to read them all.'

- Q-float varies in two ways cross-linguistically:
  - In the quantifiers that can undergo Q-float.
  - In the syntactic positions that can host Q-float.

- Formal and typological research has found that Q-float is cross-linguistically widespread and common, though not universal (Whaley 2001; Bobaljik 2003).
- I will show that the availability of Q-float is predictable in classifier languages.

3 A Generalization about Quantifier Float

- It is well-known that mainland SEA languages basically have two orders of nouns (N) relative to Num-Clf (Q) (Jones 1970; Delancey 1986):

  'Eastern' (QN) order: Vietnamese, Chinese, Hmong-Mien, North and Central Tai
  'Western' (NQ) order: Khmer, Tibeto-Burman, Southwestern Tai

- This section defends the following observation:

  (7) *Quantifier Float Generalization*
  Rightward quantifier float (of Q/Num-Clf) is only attested in classifier languages which allow the noun phrase-internal order NQ.

- This generalization holds across several language families with classifiers.

3.1 Japanese and Korean

- Japanese and Korean both allow both QN and NQ orders; in both languages, the QN order requires a genitive suffix on the classifier:

  (8) a. *san -nin =no kasyu =ga*
  3 -clf gen singer =nom
  (both) 'three singers'

  b. *kasyu san -nin =ga*
  singer 3 clf nom
  (Japanese)

  (9) a. *sey -myeng =uy haksayng =i*
  3 -clf gen student =nom
  (both) 'three students'

  b. *haksayng sey -myeng =i*
  student 3 clf nom
  (Korean)

- Q-float in both languages has been extensively studied (Ko 2007; Nakanishi 2008, e.g.).

  (10) a. *Kinoo [kasyu **san-nin**] =ga utat-ta*
  yesterday singer 3-clf =nom sing-pst
  'Three singers sang yesterday.' (Nakanishi 2008, ex. 1)

  b. *[kasyu] =ga Kinoo **san-nin** utat-ta*
  singer =nom yesterday 3-clf sing-pst

  (11) a. *[Haksayng **sey-myeng**] =i maykcwu =lul masi -ess -ta.*
  student 3-clf =nom beer =acc drink -pst -dec

  b. *[Haksayng-tul] =i maykcwu =lul **sey-myeng** masi -ess -ta.*
  student-pl =nom beer =acc 3-clf drink -pst -dec
  'Three students drank beer.' (Ko 2007, ex. 2)

- NQ order in Japanese/Korean NPs is correlated with the availability of Q-float.

3.2 Sino-Tibetan

- Sino-Tibetan languages primarily split along the major historical divide:

  (12) a. **Tibeto-Burman:** NQ order, allow Q-float
  b. **Chinese:** QN order, no Q-float

- Burmese only allows the NQ order, and has a productive process of Q-float:

  (13) a. *dii-nee Yangoun-ko [caunthaa **thoun-yauq**] laa-ke-te*
  this-day Rangoon-to student 3-clf came

  b. *dii-nee [caunthaa] Yangoun-ko **thoun-yauq** laa-ke-te)*
  this-day student Rangoon-to 3-clf came
  (both) 'Today three students came to Rangoon.' (Burmese; Simpson 2011, ex. 3)

- Likewise, Nuosu/Yi (Loloish: Sichuan) has the NQ order and productive Q-float:

  (14) a. a^{44}-zi^{33} [$thu^{31}$$zɪ^{33}$ **$ñi^{31}$-po^{31}**] i^{31}-$ñi^{31}$ $pɪ^{31}$ o^{44}
  child book 2-clf today read dec

  b. a^{44}-zi^{33} [$thu^{31}$$zɪ^{33}$] i^{31}-$ñi^{31}$ **$ñi^{31}$-po^{31}** $pɪ^{31}$ o^{44}
  child book today 2-clf read dec
  (both) 'Children read two books today.' (Nuosu/Yi; Suhua Hu, p.c.)

- Finally, Eastern Kayah Li (Karenic: Burma) has both the NQ order and Q-float:

  (15) a. ***phúcè sí-sō*** *cwá dɤ́ hóhó*
  child 3-clf go to school

  b. ***phúcè*** *cwá dɤ́ hóhó* ***sí-sō***
  child go to school 3-clf
  (both) 'Three children went to school' (Kayah Li; Solnit 1997, p. 161)

- Chinese languages have the QN order and lack Q-float; the closest equivalent is a preverbal Q-adverb *dou* (Xiang 2008):

(16) a. *San-ge ren chi-le yi-guo pingguo pai.*
Three-clf person eat-pfv one-clf apple pie
'Three people ate an apple pie.'
b. *San-ge ren* ***dou*** *chi-le yi-guo pingguo pai.*
Three-clf dou person eat-pfv one-clf apple pie
'Three people each ate an apple pie.'

- In Sino-Tibetan, these orders also correlate with primarily VO (Chinese) vs. primarily OV (Tibeto-Burman):

(17)

Family	Language	QN	NQ	Q-float
Sino-Tibetan	Burmese	○	●	●
	Karen	○	●	●
	Yi	○	●	●
	Chinese	●	○	○

3.3 Kra-Dai

- Kra-Dai languages are VO, but split into two groups in their NP syntax:

(18) a. **Southwestern Tai:** NQ order, allow Q-float
b. **Central, Northern Tai:** QN order, no Q-float

- Thai has obligatory NQ word order and well-documented Q-float (Wongbiasaj 1979; Simpson 2011):

(19) a. *[Nák.riian* ***thúk-khon]*** *aan nǎŋsɯ̌ɯ*
student every-cl^{person} read book
b. *[Nák.riian] aan nǎŋsɯ̌ɯ* ***thúk-khon***
student read book every-cl^{person}
'All the students read a book.'

- In contrast, Nung (C. Tai) has the QN word order and no recorded Q-float:

(20) *áu hù' slóng óhng déhc tê*
take give 2 clf child that
'Give it to those two children.' (Nung; Saul and Wilson 1980, p. 27)

- Thus, available data from Kra-Dai supports the generalization:

(21)

Family	Language	QN	NQ	Q-float
Kra-Dai	Thai	○	●	●
	Nung	●	○	○

3.4 Austroasiatic

- Austroasiatic languages, at least those whose syntax is described, exhibit a similar split to Kra-Dai:

(22) a. **"Western" (e.g. Khmer, Mon, Palaung):** NQ order, apparent Q-float
b. **"Eastern" (e.g. Vietnamese):** QN order, no Q-float

- Like Thai, Khmer has NQ order in the NP and also allows Q-float:

(23) a. *[khruu* ***bəy-niet]*** *ɛ:n sip^{h}əl*
teacher 3-clf read book
b. *[khruu] ɛ:n siphəl* ***bəy-niet***
teacher read book 3-clf
(both) 'Three teachers read a book.' (Khmer; notes)

- Mon and other western Austroasiatic languages have the NQ order as well (Milne 1921; Jenny 2011) though little data is available on whether they have Q-float.

- Vietnamese has QN order (24), no attested Q-float, and makes use of a preverbal universal quantifier, like Chinese (25):

(24) *ba cuô'n sách*
three clf book
'Three books' (Vietnamese; Nguyen 2004, ex. 1d)

(25) *[cuôn sách nào]* ***cũng*** *bi cháy.*
clf book which **all** get burn
'Every book got burnt.' (Vietnamese; Nguyen 2012, ex. 6)

- Again, available data from Austroasiatic supports the generalization:

(26)

Family	Language	QN	NQ	Q-float
Austroasiatic	Khmer	○	●	●
	Vietnamese	●	○	○

3.5 Austronesian

- Most Austronesian languages lack generalized numeral classifiers. However Moken (Burma/Thailand) clearly falls into the NQ category while Malay shows an internal subject-object asymmetry:

(27) a. **Moken, Malay objects** NQ order, Q-float
b. **Malay subjects** QN, no Q-float

- Moken requires classifiers, and has general NQ order, likely due to Thai and Burmese influence, and allows quantifier float:

(28) a. *[manok **a-bulat**] adɛʔ*
chicken 1-clf big
b. *[manok] adɛʔ **a-bulat***
chicken big 1-clf
(both) 'One chicken is big.' (Moken; field notes)

- Malay allows both NQ and QN order in object position (Dan Kaufman, p.c.):

(29) a. *saya beli [**tiga ekor** sapi]*
1sg buy 3 clf cow
b. *saya beli sapi **tiga ekor***
1sg buy cow 3 clf
'I bought three cows'

- Yet subjects only allow the QN order, due to the indefiniteness of NQ:

(30) a. ***Tiga ekor** sapi makan semua rumput*
3 clf cow eat all grass
'Three cows ate all the grass'
b. ??*Sapi **tiga ekor** makan semua rumput*
cow 3 clf eat all grass
'Three cows ate all the grass'

- As predicted, Q-float is possible only from object position:

(31) a. *Saya beli [sapi] kemarin **tiga ekor***
I buy cow yesterday 3 clf 1
'I bought three cows yesterday.'
b. **[Sapi] makan rumput **tiga ekor***
cow eat grass 3 clf

- These facts are precisely predicted by the Q-float generalization:

(32)

Family	Language	QN	NQ	Q-float
Austronesian	Moken	○	●	●
	Malay (O)	○	●	●
	Malay (S)	●	○	○

- The behavior of Chamic w.r.t. Q-float is unknown, though I believe they allow classifiers in multiple positions like Malay.

3.6 Hmong-Mien

- All Hmongic languages appear to be QN, and none have attested Q-float:

(33) *ib tus tub.txib*
1 clf messenger
'one messenger' (Hmong: Bisang 1993, ex. 6)

(34) *tsɨ*^{55} *la*^{35} *tao*^{55}
3 clf.indef tau
'three hills' (Weining Amao: Gerner and Bisang 2010, ex. 6b)

- Little else is known about quantification in these languages.

3.7 Summary

(35) *Quantifier Float Generalization*
Rightward quantifier float (of Q/Num-Clf) is only attested in classifier languages which allow the noun phrase-internal order NQ.

(36)

Family	Language	QN	NQ	Q-float
	Japanese	●	●	●
	Korean	●	●	●
Sino-Tibetan	Burmese	○	●	●
	Karen	○	●	●
	Yi	○	●	●
	Chinese	●	○	○
Kra-Dai	Thai	○	●	●
	Nung	●	○	○
Austroasiatic	Khmer	○	●	●
	Vietnamese	●	○	○
Austronesian	Moken	○	●	●
	Malay (S)	●	○	○
Hmong-Mien		●	○	○

Some typological observations

- Western mainland SEA ⟶ NQ order, Q-float
- Eastern mainland SEA ⟶ QN order, no Q-float.
- OV word order ⟶ NQ order, Q-float
- (36) is independent from the position of N-A/RC/Dem.

4 Two partial explanations

- Two flawed explanations for the NQ-Q-float correlation:
  Headedness NQ word order and rightward Q-float are both head-final properties.
  Stranding Q-float is derived by leftward movement of the noun, stranding Q.

4.1 Contact-induced shift in headedness

(37) Proposed historical explanation:

a. NQ word order and rightward Q-float are properties of head-final languages.
b. VO languages which pattern with OV languages in this way are shifting to become head-final due to contact with TB.

- Putative support:
  1. Every head-final language in the survey above has Q-float.
  2. QN is demonstrably original in Kra-Dai, NQ occurs only in SW Tai.
  3. NQ languages have some head-final properties, e.g., sentence-final particles, post-verbal 'can', sentence-final negation (Moken).
- Some problems with this view:
  1. Thai, Khmer, Moken are still stably head-initial.
  2. QN order also occurs in head-final languages (Japanese and Korean)
  3. Chinese has many head-final properties (e.g. Rel-N, Adv-V), but no Q-float.
  4. Exceptions to the generalization are expected.

4.2 Stranding

- The stranding analysis of Q-float (Sportiche 1988; Miyagawa 1989; Shlonsky 1991; Miyagawa and Arikawa 2007):

  (38) $N_i \ldots [_{VP} [\ t_i\ Q\ ] [_{VP} \ldots]]$

  -Movement to the edge of some domain (e.g. NP) is necessary before moving out of that domain, potentially explaining the generalization.
- Two arguments against a stranding analysis of Thai:
  1. Thai FQs occupy positions which are never occupied by full noun phrases.
  2. Thai object FQs are structurally higher than objects, contrary to the predictions of the stranding analysis:
- Thai subject Qs must scope above negation (39a), while FQs can scope below (39b):

(39) a. *nák-riian* ***thúk-khon*** *(yaŋ)* ***mâj*** *[*$_{VP}$ *kin khâaw]*
student every-clf still neg eat rice
'Every student still hasn't eaten.' $\forall > \neg$, *$\neg > \forall$

b. *nák-riian (yaŋ)* ***mâj*** *[*$_{VP}$ *kin khâaw]* ***thúk-khon***
student still neg eat rice every-clf
'Every student still hasn't eaten.' $\forall > \neg$, $\neg > \forall$

- Object Qs must scope *below* negation (40a), while object FQs can scope above (40b):

(40) a. *Joe* ***mâj*** *[*$_{\text{VP}}$ *phóp nákriian* ***thúk-khon*** *] mûuawaannii*
Joe neg meet student every-clf yesterday
'Joe didn't meet all of the students yesterday' *$\forall > \neg, \neg > \forall$

b. *Joe* ***mâj*** *[*$_{\text{VP}}$ *phóp nákriian] mûuawaannii* ***thúk-khon***
Joe neg meet student yesterday every-clf
'Joe didn't meet all of the students yesterday' $\forall > \neg, \neg > \forall$

(41) a. Q-float lowers the scope of subject quantifiers relative to negation.
b. Q-float raises the scope of object quantifiers relative to negation.

- Evidence from ellipsis (Δ) that object FQs are higher than their object host:

(42) *ʔaacaan tɔ̂ɔŋ [*$_{\text{VP}}$ *ʔaan níyaay]* ***sɔ̌ɔŋ-khon****, sùuan nák.rian tɔ̂ɔŋ* Δ
teacher must read novel 2-clf^{person} but student must
thúk-khon
every-clf^{person}
'Two of the teachers have to read a novel but all of the students have to.'

(43) *ʔaacaan tɔ̂ɔŋ [*$_{\text{VP}}$ *duu lákhɔɔn]* ***sɔ̌ɔŋ-rûaŋ****, sùuan nák.rian tɔ̂ɔŋ* Δ
teacher must watch soap.opera 2-clf^{story} but student must
sǎam-rûaŋ
3-clf^{story}
'The teachers have to watch two soap operas but the students have to three (soap operas).'

- **Conclusion**: The stranding analysis is incorrect for Thai, so it cannot explain the Q-float generalization.

5 Towards a formal explanation

- Two ingredients:
  1. Q-float is focus-induced rightward movement.
  2. Rightward movement is order-preserving.

5.1 Evidence that floated quantifiers are in focus

- Arguments that FQs are in focus
  1. The ellipsis facts in (43) are focused contexts.
  2. Q-float is preferred in presentational contexts (Simpson 2011, ex. 65)

(44) *mii dèk maa ŋaanpaatîi raw sìisìp-kwàa khon*
have child come work.party around forty-plus clf
'There were more than forty children that came to the party.'

- These are necessarily existential, hence quantificational uses of indefinites.
- The assertion is the existential quantifier; it is new information.

  3. Quantity questions and their answers are preferentially floated:

(45) a. *nákriian chɔ̂ɔp kin ʔahǎan-faràŋ kìi-khon?*
student like eat food-western how.many-clf
'How many students like to eat western food?'

b. *(nákriian chɔ̂ɔp kin ʔahǎan-faràŋ) sǎam-khon*
student like eat food-western 3-clf
'Three students like to eat western food.'

- *Wh*-questions and their answers are focused, supporting a relationship between Q-float and focus.

  4. FQs must be the answer to polar questions when floated:

(46) a. *Q: nákrian sɔ̀ɔp tòk* ***thúk-khon*** *mǎj?*
students test fall every-clf Q
'Did every student fail the test?'
b. *A: sɔ̀ɔp tòk* ***thúk-khon***
test fall every-clf
'Yes.'
c. *A:* ***thúk-khon***
every-clf
'Yes.'

- These observations support the conclusion that (information) focus drives Q-float.
- This is typologically unsurprising: old information is typically aligned at the beginning of a clause, new information at the end (e.g. Birner 1994; Büring 2009)

5.2 Rightward movement and order preservation

- Rightward movement is well known to be order preserving:

(47) a. I saw the children from France already.
b. I saw the children already from France.

(48) a. I read the book that my brother wrote last week.
b. I read the book last week that my brother wrote.

(49) a. I read the interesting book last week.
b. *I read the book last week interesting.

- An possible explanation for this observation is that *NP/QP/DP is a phase, a cyclic domain for transfer to PF*:

(50) *Consistency*: If an order is established within a phase, that order must be respected at later stages. (Fox and Pesetsky 2005; Ko 2007)

(51) *Consistency in rightwards Q-float from object position with N-Q order*
a. QP = { NP ≺ Q ≺ Clf }
b. vP = { V ≺ QP$_i$ ≺ Adv ≺ QP$_i$ }
c. { V ≺ NP ≺ Adv ≺ Q ≺ Clf }
d. *{ V ≺ Q ≺ Clf ≺ Adv ≺ NP }

- This accounts for the absence of Q-float to the right in SVO languages with Q-N order (e.g. Mandarin):

(52) *Inconsistency in rightward Q-float from subject position with Q-N order*
a. QP = { Q ≺ Clf ≺ NP }
b. CP = { QP$_i$ ≺ Adv ≺ QP$_i$ ≺ VP }
c. { Q ≺ Clf ≺ Adv ≺ NP ≺ VP }
d. *{ NP ≺ Adv ≺ Q ≺ Clf ≺ VP }

- Leftwards Q-float does not occur because leftward movement is not focus-driven.

6 Conclusion

(53) **Quantifier Float Generalization**
Rightward quantifier float (of the *Q/Num-Clf*) is only attested in classifier languages which allow the DP-internal order N-Q/Num-Clf (N-Q).

- This generalization is particularly clear and across all language families in SE Asia.
- Historical/contact-driven explanations fail to account for the non-tendencial nature of the generalization.
- Stranding-based explanations fail to account for Q-float in VO languages like Thai.
- Viewing Q-float as rightward focus-driven movement allows an explanation to be offered based on the interface between syntax and phonology.
- Further questions:
  1. Is the generalization in (53) generally true outside of classifier languages?
  2. What accounts for the difference between QN and NQ order?
  3. Should Q-float receive the same analysis in head-initial and head-final languages?

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