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Quantifier Float in Hmong

Nathan M. White
James Cook University
and Western Institute for Endangered Language Documentation
nathan.white1@jcu.edu.au
ORCID: 0000-0003-4648-8040

Abstract

The typology of quantifier float (QF) in classifier languages has been the subject of research in several recent works. Some proposals suggest that languages should either have noun classifiers or the ability for the quantifier to “float,” that is, appear separate from the noun it quantifies. QF has never been described for any Hmong-Mien language, leaving a critical gap in existing work and limiting the existing typology. The current work fills this gap with an analysis of quantifier float in Hmong, and considers that Hmong possesses both bare classifiers and quantifier float, a combination previously unattested in the literature on QF and contrasts with current typological proposals. Hmong allows this via two quantifier + noun orderings (QN and NQ) related to two functions of the classifier system that both permit quantifier float. The QN-only ordering is canonically associated with indefinite nouns, and the NQ ordering involves a nested noun phrase structure and is associated with definite nouns (generally with inner NP-internal bare noun classifiers) and partitive or distributive readings. The QN-only ordering is particularly significant for the typology as quantifier float to the right is permitted for quantifier + classifier sequences associated with a prenominal NP-internal position, as the classifier involved in this QF pattern occupies the same syntactic position within the noun phrase as the bare noun classifier in noun phrases generally.

Keywords: Quantifier Float, Quantifiers, Classifiers, Hmong, Hmong-Mien, Applied Natural Language Processing

1 Introduction

The study of the separability of a noun and the quantifier that modifies it has been the subject of a number of studies over the past several decades. The typological proposals in Jenks (2010, 2013b) suggest that languages should have either bare classifiers or the ability for noun and quantifier to separate, where the two may have unrelated intervening material in between. However, this ability to separate, often termed “quantifier float” in the literature, has never been described for any Hmong-Mien/Miao-Yao language, leaving a critical gap in existing work. The current paper seeks to fill this gap, providing an analysis of quantifier

float in Hmong (specifically Laotian White Hmong; Hmong-Mien, Laos and diaspora; mww) and considering findings in light of the emerging typology of quantifier float, especially as it involves classifier languages.

The QF phenomena in Hmong expands our understanding of the relationship between classifiers and QF, as it attests both bare classifiers and QF.¹ Example (1) illustrates the use of a bare classifier, where the noun *dav* ‘eagle’ appears with the bare classifier *tus* ‘CLF.ANIM’, whose presence triggers a definite interpretation (cf. Simpson 2005; Simpson et al. 2011).

- (1) [***Tus*** ***dav***]_{NP} *dhia* *ob* *peb-plhaw...*
 CLF.ANIM eagle jump two three-VCL.JUMP
 ‘The eagle jumped two or three jumps...’
 (Cha 1994: 68)

At the same time, Hmong permits QF in the form of noun-phrase-internal quantifiers preceding the head noun that are allowed to float. For example, in (2), the quantifier *ntau* ‘many’ appears in situ in the noun phrase ‘many cars’, while in (3), *ntau* appears with the classifier *lub* ‘CLF.GNRL’ separated from its head noun *tsheb* ‘car’ at the right edge of the clause.

- (2) *Zoo-nkaus* *li* [[***ntau*** ***lub***]_{QCC} ***tsheb***]_{NP} *twb* *dhau* *tuaj* *lawm*
 be.like-INTS COMP many CLF.GNRL car already pass come CP
 ‘it seems that many cars had passed’
- (3) *Zoo-nkaus* *li* ***tsheb***_{NP,i} *twb* *dhau* *tuaj* *lawm* [***ntau*** ***lub***]_{QCC,i}
 be.like-INTS COMP car already pass come CP many CLF.GNRL
 ‘it seems that many cars had passed’
 (Cha 1994: 396)

This combination of bare classifiers and QF in a single language currently remains unattested in the typological literature on QF, which has predicted languages to have either bare classifiers or QF, but not both.

¹ Abbreviations used in the current work include: 1 first person, 1D one-dimensional, 2 second person, 3 third person, ADJ adjective, AL Altaic, ANIM animate, ATT attainment, CLF classifier, COMP complementizer, CP completion/change-of-state marker, DEM demonstrative, DP determiner phrase, DU dual, F final (headedness), GNRL general, HM Hmong-Mien, I initial (headedness), IMPT subjective importance, INTS intensifier, IO indirect object, IOM indirect object marker, IRR irrealis, KD Kra-Dai, LOCL localizer, LP localizer noun phrase, MK Mon-Khmer, MOD modifier, N noun, NP noun phrase, NQ noun-quantifier (order), OBJ direct object, PA non-singular/abstract, PL plural, POM preposed object marker, POSS possessive, Q quantifier, QCC quantifier-classifier combination, QF quantifier float, QN quantifier-noun (order), RC relative clause, RC relative clause marker, REDUP reduplication, SBJ subject, SEQ sequential, SG singular, ST Sino-Tibetan, TOP topic, V verb, and VCL verb classifier.

The current introduction provides a brief orientation to aspects of the Hmong language and the issues surrounding quantifier float in Hmong. Section 1.1 briefly discusses the framework for the current paper. Section 1.2 is an introduction to the structure of the noun phrase and clause in Hmong, and sources for the current study are presented in Section 1.3. A definition of quantifier float is discussed in Section 1.4, while goals and structure for the rest of the paper are delineated in Section 1.5.

1.1 Framework of the study

A descriptive-functional framework is followed for the current work that prioritizes the description of the quantifier phenomena found in Hmong for purposes of furthering the typological perspective without regard to the debate of whether a robust theory must involve derivation in cases of unbounded and other dependencies (see Chaves and Putnam 2020) such as quantifier float. Furthermore, following Dixon (2010: 4), it is assumed here that justification of typological claims must be achieved through independent proof from each language, which thus encourages empiricism-driven descriptive adequacy for language-internal phenomena to ensure adequacy at the level of explanation and prediction.

Moreover, the functional aspect of this approach leads to an emphasis on real-world examples and language use over artificial, constructed examples and context-less elicitation, as invented examples can lead to unreliable grammaticality judgments on data not naturally a part of the language (Mithun 2001: 48; Chelliah 2001: 160), or on data outside of an appropriate discourse context (Matthewson 2004: 393–394; cf. Schütze 1996: 148–157). Likewise, an overreliance on elicitation can lead to unreliable generalizations or a failure to discover what is actually possible grammatically in the language (Chelliah 2001: 152, 160; Gil 2001: 115). Rather, the focus here is on language as it is used in context, with limited forays into attempting and checking expressions that modulate on confirmed grammatical expressions couched in their original contexts (cf. Matthewson 2004: 392 on translation elicitation methods; Schütze 1996: 148–150 and the need to use context, citing Bolinger 1968), and where grammaticality preferably depends on a speaker's own willingness both to accept and to use the expression in question (Dixon 2007: 24).

1.2 Structure of the noun phrase and clause

The noun phrase in Hmong can be descriptively characterized as consisting of slots as presented in Figure 1.

LOCL	POSS NP	Q	CLF/ADJ	N	MOD N	RC	DEM	LOCL NP (=LP) ²
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Figure 1. A schematic of the slot structure of the noun phrase in Hmong (cf. White 2019: 224).

Each slot in the noun phrase may be optionally filled (White 2019: 224). Quantifiers may appear in Q, as in (4), where the quantifier *ib* ‘one’ appears in Q position in the noun phrase *ib rab qws* ‘one club’; they may also appear in a Q position within an LP, as in (5), where the quantifier *xya* ‘seven’ appears in Q position within the embedded LP *ntawm kuv xya leej ntshais* ‘(within) my seven daughters’.

- (4)
- | | | |
|-------------|------------|----------------------------|
| Q | CLF | N |
| [<i>ib</i> | <i>rab</i> | <i>qws</i>] _{NP} |
| one | CLF.TOOL | club |
- ‘...one club...’
(Cha 1994: 41)

- (5)
- | | | | | | |
|-----------------|----------------|------------|------------|-------------|--|
| | LOCL | POSS NP | Q | CLF | N |
| [<i>ib-tug</i> | [<i>ntawm</i> | <i>kuv</i> | <i>xya</i> | <i>leej</i> | <i>ntshais</i>] _{LP}] _{NP} |
| one-CLF.ANIM | LOCL.nearby | 1SG | seven | CLF.HUMAN | daughter |
- ‘one of my seven daughters’

One complication of the grammar of the noun phrase is that, in certain conventionalized situations, a quantifier and classifier can together form a single grammatical word (term following Aikhenvald et al. 2020), as with *ib-tug* ‘one-CLF.ANIM’. Where this occurs, the tone category of the second element may undergo lexical tone sandhi as indicated by the final tone letter in the orthography, as in the change *tus* ‘CLF.ANIM’ to *-tug* ‘CLF.ANIM’.³ Quantifiers include the set of lexical number words (that is, the set of cardinal numerals as numeral quantifiers), and what may be termed general modifiers, encompassing existential quantifiers as well as series terms, including *thawj* ‘first’, *lwm* ‘another’, *txhua* ‘each, every’, *ntau* ‘much/many’, *coob* ‘many.ANIM’, and *pes tsawg* ‘how many?’.

In terms of the clause, Hmong generally exhibits an S V / A V O word order, where S represents an intransitive subject and A a transitive subject. While word order inversions due to discourse can apply in Hmong, where a presentational construction may exhibit VS word

² Huang (2010) handles these phrases as localizer phrases (LP) in his analysis of the corresponding construction in Chinese, headed in his analysis by L (localizer) and taking a DP complement. His analysis is, *prima facie*, generally amenable to the phenomenon found in Hmong.

³ To be sure, tone sandhi generally applies phonologically, such that one would expect tone sandhi to apply to phonological words; however, as reported in White (2020), it has been lexicalized in Hmong and is thus no longer productive phonologically, and its presence in Hmong synchronically is generally associated with grammatical words, i.e., syntactic atoms, rather than with phonological words per se. The reader is directed to White (2020: 244–245) for more information on this phenomenon.

order for example, generally speaking, all core arguments of the verb precede the completion/change-of-state marker *lawm* ‘CP’, which is significant for the discussion below.

1.3 Sources of current study and methodology

The current study is based primarily on a number of sources, including:

- 1) a corpus of edited narrative texts found in the collection *Dab Neeg Hmoob* (Johnson and Yang 1992), written in White Hmong;
- 2) a corpus of narrative texts drawn from the Hmong literacy book *Kawm Ntawv Hmoob* (Cha 1994), likewise written in White Hmong;
- 3) a corpus of checked narrative texts from native speakers from the Hmong community in Queensland, Australia, of both White Hmong and Blue/Green Mong varieties;
- 4) interactions and utterances tried with Hmong consultants in Queensland, Australia; and
- 5) the 12 million-token soc.culture.hmong Usenet Corpus (Mortensen 2015; Mortensen et al. 2022).

Methodologically, a hybrid traditional descriptive and computational approach to data analysis was pursued. Computationally, natural language processing techniques were applied to data sources 2 and 5 above via NLTK (Bird et al. 2009), and a part-of-speech tagger for Hmong (White 2022) was utilized. These resources were used to find appropriate colligation sequences involving quantifier + classifier with the completion/change-of-state marker *lawm* ‘CP’, where *lawm* serves as a disambiguating marker for position, as well as with indications of clause-final position such as the set of clause-final markers and final punctuation.

1.4 Quantifier float defined

In his work on quantifier float in classifier languages, Jenks (2013b) provides a working definition of quantifier float for these languages, as reproduced in (6).

(6) *Quantifier Float*

The ability for adnominal quantifiers to shift from an adnominal position to an adverbial position with only scopal effects on meaning.

Given the descriptive-functional theoretical framework applied in the current work, which explicitly takes no stance on questions of whether a theory must assume the existence of derivations such as movement *per se* to account for dependencies (§1.1), the use of “quantifier float” here indicates that a modifier (i.e., the quantifier) that applies to a constituent (i.e., the noun phrase) appears separated from that constituent in the surface structure, where there is otherwise a clear “association” between the quantifier and a

quantifier position inside a noun phrase whose noun the quantifier quantifies. For those theories that assume it, this is equivalent to a non-local dependency that evidences movement.

This leaves the second part of Jenks’s definition, i.e., “with only scopal effects on meaning.” In Jenks (2013a, 2013b), evidence for scopal effects is provided specifically for two quantifier + classifier sequences in Thai, *sák-khon* ‘even.one-CLF’ and *thúk-khon* ‘every-CLF’, where floated quantifiers permit variable scope. Preliminary evidence from Hmong, as presented in Section 3.6, indicates that Hmong likewise exhibits a scopal effect on meaning in QF.

The details of how quantifier float has been analyzed in the literature, including in theoretical frameworks that posit movement or “float”, appear in Section 2 below.

1.5 Goals and structure of paper

The goal of the current paper is to provide an account of quantifier float in Hmong, specifically as it pertains to numeral classifiers, with a goal of informing the current typological perspective. The remainder of the paper has three sections. Section 2 covers the critical literature; Section 3 provides the details of quantifier float in Hmong. Section 4 provides a discussion of implications for the typology, and a brief conclusion appears in Section 5.

2 Literature

While the current account seeks to cast Hmong quantifier float in terms of a descriptive-functional framework, discussion of quantifier float cross-linguistically has been dominated by those analyzing the phenomenon within the generative theoretical tradition. These generative analyses have generally divided into two main viewpoints. The first is an adverbial analysis for quantifier float where floating quantifiers are analyzed as elements that are base-generated as adverbs adjunct to a verb phrase, a position articulated in Kayne (1975) and followed by a number of authors (including Baltin 1995; Belletti 1982; Bobaljik 1995; Bošković 2004; Brisson 1998; Doetjes 1992; Dowty and Brodie 1984; Koopman 2009; Miyagawa 1989; Nakanishi 2004, 2007; Torrego 1996). The second analysis, first proposed by Sportiche (1988), is a stranding analysis where the quantifier remains in situ and the rest of the nominal content as complement is raised leaving the quantifier stranded, and is a view with its own robust following (including Cinque 1999; Déprez 1989; Giusti 1990, 1994; Henry 2012; McCloskey 2000; Merchant 1996; Miyagawa and Arikawa 2007; Shlonsky 1991; Zyman 2018). Besides these, a third view has emerged that considers that quantifier

float in a given language may involve both adverbial and stranding phenomena, a position taken by Benmamoun (1999), Cirillo (2009), and Fitzpatrick (2006).

In specific regard to Mainland Southeast Asian languages, due to the presence of floated quantifiers in positions far to the right in surface form in Thai not adequately predicted by the above approaches, Simpson (2004, 2011) and Chaiphet (2017) have argued for a rightward extraposition analysis specific for Thai that operates in parallel to Heavy NP Shift (i.e., where a long noun phrase moves to the right past other intervening content due to its length) and extraposition of relative clauses, while Jenks (2011, 2013a) argues in favor of an analysis where quantifier float is motivated by Quantifier Raising (i.e., movement of a quantifier to serve as an adjunct to a constituent at a higher level in the syntactic tree; May 1985).

In a Lexical-Functional Grammar approach, Spector (2009) argues for a non-derivational relationship between quantifier float and non-float constructions in Hebrew due to differences in semantics, while Otoguro and Snijders (2016) claim that the structural distribution of floating quantifiers is determined both by syntax and by information structure, where floating quantifiers serve as a focused element modifying topic noun phrases. In a Basic Linguistic Theory-oriented approach, Jarkey and Komatsu (2019) analyze different numeral + classifier constructions, including floated quantifiers, in Japanese, and likewise determine that the “quantifier float” form has a distinct semantic function from the other constructions in that the noun-phrase external use signals indefiniteness while pre-nominal noun phrase-internal use signals specificity. They further argue that the quantifier float construction indicates an adverbial modification of the real-world referent rather than modification of the noun itself.

Relevant to the current discussion on Hmong, Jenks (2010, 2011, and 2013b) and Huang and Ochi (2014) propose typological generalizations affecting Southeast and East Asian languages, respectively, in regard to quantifier float (Section 2.1), while Simpson (2005, 2011) and Jarkey and Komatsu (2019) address partitivity and its relation to the structure of the noun phrase (Section 2.2).

2.1 Typological generalizations

In Jenks (2010, 2011, and 2013b), a typology of QF in classifier languages of East and Southeast Asia is formulated. As introduced in Section 1.4, Jenks defines QF as follows:

(6) *Quantifier Float*

The ability for adnominal quantifiers to shift from an adnominal position to an adverbial position with only scopal effects on meaning. (Jenks 2013b: 1)

He works out a typological generalization that combines several observations made regarding his sample of languages from several families. Specifically, he notes that some languages do not permit a classifier to appear without a numeral (i.e., do not permit bare classifiers), and that this patterns strongly with whether quantifier float appears in the language as well as whether the quantifier appears before or after its noun in terms of surface position. He provides a definition for this generalization as follows:

(7) *Quantifier Float Generalization*

Rightward quantifier float (of the Q/Num-Clf) is only attested in classifier languages which allow the noun phrase-internal order NQ. (Jenks 2013b: 2; cf. Jenks 2011: 307)

He provides an overview of several select parameters in several classifier languages of the region, focusing on family affiliation (Sino-Tibetan [ST], Mon-Khmer [MK], Hmong-Mien [HM], Kra-Dai [KD], and Altaic [AL]), headedness (initial [I] or final [F]), relative surface ordering of quantifiers with nouns (quantifier-noun [QN] or noun-quantifier [NQ]), permissibility of classifiers with nouns without a quantifier (yes [Y] or no [N]), and existence of QF; an adaptation appears in Table 1.

Table 1. Overview of parameters relevant to QF among selected East/SE Asian languages. (Jenks 2010: 2)⁴

	Mandarin	Cantonese	Vietnamese	Hmong	Nung	Burmese	Japanese	Korean	Khmer	Thai
Family	ST	ST	MK	HM	KD	ST	AL	AL	MK	KD
Headed	I	I	I	I	I	F	F	F	I	I
QN/NQ	QN	QN	QN	QN	QN	NQ	NQ	NQ	NQ	NQ
Clf-N	N	Y	Y	Y	Y	N	N	N	N	N
Q-Float	N	N	N	N	N	Y	Y	Y	Y	Y

Based on the patterns in Table 1, Jenks (2010) posits a correlation that only QN-ordered (i.e., QN-only) languages have bare classifiers, while quantifier float only appears in languages that permit NQ. He argues that languages that have quantifier float possess a classifier phrase (ClfP) that is adjunct to the noun phrase (NP), while languages with bare classifiers have classifier phrases that take noun phrases as complements. At the same time,

⁴ For Japanese and Korean, Jenks (2010) notes that NQ should receive the interpretation “allowing the NQ order,” as an alternative QN order is also available.

he argues that languages with an adjunct classifier phrase can have either QN or NQ order, where the structures are equivalent such that the classifier phrases are adjoined on the left or the right side of the noun phrase. Thus, if a language has bare classifiers, it should not be expected to also have quantifier float, given the $[_{ClfP} QP [_{ClfP'} Clf [_{NP} N]]]$ structure if the language permits bare classifiers, and $[_{NP} [_{ClfP} QP [_{ClfP'} Clf]] [_{NP} N]]$ structure with quantifier float, which are straightforwardly incompatible.

Given this, Jenks (2013b) proposes a more formal definition of his generalization:

(8) *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). (Jenks 2013b: 1; emphasis original)

In other words, in his view, quantifier float of the rightward kind (i.e., non-stranding) can apply only in languages that have a $[_{DP} [_{DP} N] [_{ClfP} QP [_{ClfP'} Clf]]]$ structure and thus NQ surface ordering.

For Hmong specifically, he notes that “All Hmongic languages appear to be QN, and none have attested Q-float” as well as “little else is known about quantification in these languages” (2013b: 4). Consistent with the dearth of adequate research on the Hmongic languages (see White 2021: 346), this reflects a critical gap in the extant literature, as I will show in Section 3 that Hmong is primarily a QN language within a single NP yet does indeed exhibit QF.

In other words, Jenks (2010) argues that QN-only languages have noun phrases with quantifiers and classifiers as functional projections, and NQ languages have noun phrases that take a quantifier + classifier constituent as an adjunct element. While this analysis has difficulty for handling the data from Thai given the corresponding arguments in Simpson (2011), the analysis will have parallels to the Hmong data discussed below.

Huang and Ochi (2014) have likewise made a generalization for numeral classifiers and their structure to account in part for patterns of specific and non-specific indefinite readings for quantifiers + classifiers in Japanese and Chinese. Interestingly, they account for the difference of specific vs. non-specific readings by assuming that a specific nominal expression is structurally larger as compared to a non-specific one (2014: 60), confirming this with evidence from Chinese, which requires a Q + Clf + N structure for a specific reading to apply. They use this to infer that the Japanese NQ ordering is specific for this reason, and that this structure has an optional abstract functional projection present, and the absence of this functional projection drives QF along with its non-specific interpretation.

2.2 Partitivity and the noun phrase

Simpson (2005) focuses on noun phrase structure (that is, DP in his analysis), especially involving classifiers, while Simpson (2011) provides a detailed description of quantifier float in Thai and Burmese.

Critical to the current discussion is his discussion of partitivity in both works. Simpson (2005) discusses the relationship between partitive readings of quantifiers and their status outside of the noun phrase (DP in his analysis). He specifically notes the general assumption that with definite noun phrases, quantification takes place outside the noun phrase, and quantification is not allowed within. He links this to Thai, where quantifiers either must be inside the noun phrase with a non-partitive reading, or elsewhere with a partitive reading. One diagnostic he uses to make the determination is the placement of the demonstrative in Thai, which he regards to be final in the Thai noun phrase. He considers Burmese as well, providing evidence for the adverbial status of quantifiers outside of the noun phrase and their partitive meaning in Burmese, and connects these to the parallel findings of works such as Fukushima (1991).

Simpson (2011) elaborates on these ideas, describing in detail the distinction between non-floated quantifiers with non-partitive meaning and floated quantifiers with partitive meaning in Thai. From this, he develops his “partitive generalization”:

(9) *Partitive Generalization*

A numeral which is external to and quantifies over a definite DP/NP gives rise to a partitive interpretation.

A numeral which is internal to a definite DP/NP does not give rise to a partitive interpretation. (Simpson 2011: 130)

With this generalization, he argues that partitive meanings can assist in determining whether a quantifier (with its classifier) is external to his DP. He argues for an “outer” position for partitive quantifiers structurally adjacent to his NP in Thai, given possessive and relative clause data which shows that partitive readings are permitted when the quantifier follows possessor or relative clause content.

In their discussion on numeral classifier constructions in Japanese, Jarkey and Komatsu (2019) explore how partitivity is produced semantically, and argue that partitivity is an interpretation that resolves a semantic clash between the definiteness encoded in a noun phrase and the indefinite reading supplied by the NP-external (i.e., quantifier float) construction when the two co-occur.

3 Quantifier float in Hmong

Six important aspects of the quantifier float phenomenon in Hmong are: 1) the basic quantifier float syntax and argument roles (Section 3.1); 2) NP-internal vs. NP-external modification and constituency (Section 3.2); 3) adverbial syntactic status (Section 3.3); 4) coreference resolution (Section 3.4); 5) co-occurrence of quantifiers in two positions with different readings (Section 3.5); and 6) questions of scope and focus (Section 3.6).

3.1 Basic quantifier float syntax and argument roles

Quantifier float in Hmong takes the form of a quantifier + classifier combination (QCC) that appears outside the noun phrase it modifies, where it would otherwise appear within it in other contexts as the default, unmarked case. In the default case, the quantifier and classifier appear preceding the head noun inside the noun phrase as in (10), where the quantifier and classifier *txhua tus* ‘each/every CLF.ANIM’ appear in situ inside the noun phrase preceding the noun *Hmoob* ‘Hmong’.

- (10) [[*Txhua tus*]_{QCC} *Hmoob*]_{NP.SBJ} *yeej* *zoo*
 every CLF.ANIM Hmong certainly be.good
 ‘Every Hmong (person) is good’
 (Mortensen 2015)

When quantifier float applies, the quantifier + classifier combination appears separated from the noun phrase, generally following the verb at or near the right edge of the clause in either the pre-completion or post-completion position (considered in Section 3.3), which are generally not associated with arguments of the verb. In example (11), the QCC, *txhua tus* ‘each/every CLF.ANIM’, appears at the clause’s right edge, separated from the noun phrase *Hmoob* ‘Hmong’ and follows the verb *zoo* ‘be good’.

- (11) [*Hmoob*]_{NP.SBJ.i} *yeej* *zoo* [*txhua tus*]_{QCC.i}
 Hmong certainly be.good every CLF.ANIM
 ‘Every Hmong (person) is good’
 (Mortensen 2015)

QF can also appear with a partitive or distributive relation where two noun phrases are nested within one another (see Section 3.2 for this analysis). The default distributive construction with a nested NP appears in (12), where *cov qub nom qub tswv* ‘the former government leaders’ appears as the inner noun phrase as the whole, and *txhua tus* ‘each/every CLF.ANIM’ appears in the outer noun phrase indicating distributivity.

- (12) *Koj chim rau [[txhua tus]_{QCC} [cov qub_nom_qub_tswv]_{NP}]_{NP}.*
 2SG be.angry EAM every CLF.ANIM CLF.PA old_official_old_master
 ‘You’re angry at all (i.e., every one) of the old government leaders.’

The above sentence can likewise be realized with the inner noun phrase and QCC in reverse order, as in (13).

- (13) *Koj chim rau [[cov qub_nom_qub_tswv]_{NP} [txhua tus]_{QCC}]_{NP}.*
 2SG be.angry EAM CLF.PA old_official_old_master every CLF.ANIM
 ‘You’re angry at all (i.e., every one) of the old government leaders.’

When quantifier float applies, the quantifier + classifier combination likewise appears separated from the noun phrase, at or near the right edge of the clause in one of the same positions as above. In example (14), the QCC, *txhua tus* ‘every CLF.ANIM’, again appears at the clause’s right edge, separated from the noun phrase *cov qub nom qub tswv* ‘the former government leaders’, and follows the completion/change-of-state marker *lawm* ‘CP’, where arguments of the verb cannot otherwise appear.

- (14) *Koj chim rau [cov qub_nom_qub_tswv]_{NP} lawm [txhua tus]_{QCC}.*
 2SG be.angry EAM CLF.PA old_official_old_master CP every
 CLF.ANIM
 ‘You’re angry at all (i.e., every one) of the old government leaders.’

The noun phrase associated with QF can take one of a number of argument roles of a verb: intransitive subject, transitive subject, direct object, and indirect object. Examples of each of these appear below with the completion/change-of-state marker *lawm* ‘CP’, which appears after all standard argument positions in the clause. First, in (15), the intransitive subject of the verb *ntuag* ‘break’, *koos phas xya cov hnab tsaj* ‘the seventh battalion’s sandbags’, is modified by the floated *ntau lub* ‘many’.

Intransitive Subject

- (15) *[koos.phas xya cov hnab.tsaj]_{SBJ.i} ntuag lawm [ntau lub]_{QCC.i}*
 battalion seven CLF.GNRL sack break CP many CLF.GNRL
 ‘many of the seventh battalion’s sandbags had broken’
 (Cha 1994: 153)

In (16), the transitive subject of the verb *pom* ‘see’, *cov neeg* ‘the people’, is modified by the floated *ntau tus* ‘many’.

Transitive Subject

- (16) *[Cov neeg]_{SBJ.i} pom [cov ntoo]_{OBJ} lawm [ntau tus]_{QCC.i}.*
 CLF.PA person see CLF.PA tree CP many CLF.1D.RIGID/ANIM
 ‘Many of the people saw the trees.’

Likewise, in (17), the (topicalized) object *cov cwj mem no* ‘these pens’ is modified by *pes tsawg tus* ‘how many’.⁵

Direct Object

- (17) [*Cov cwj.mem no*]_{TOP.OBJ.i} *koj*_{SBJ} *siv lawm* [*pes.tsawg tus*]_{QCC.i?}
 CLF.PA pen this 2SG use CP how.many CLF.1D.RIGID/ANIM
 ‘(As for) these pens, how many have you used?’

Finally, in (18), the indirect object *Hmoob* ‘Hmong’ is modified by *ntau tus* ‘many’.

Indirect Object

- (18) *Kuv*_{SBJ} *tau hais rau Hmoob*_{IO.i} *lawm* [*ntau tus*]_{QCC.i.}
 1SG ATT say IOM Hmong CP many CLF.ANIM
 ‘I (already) talked (lit., said [unstated]) to many of the Hmong.’

3.2 NP-internal vs. NP-external modification and constituency

In the most basic case, sequences of quantifier + classifier (or quantifier-classifier combination, QCC) in Hmong generally precede the noun they modify with a straightforward cardinal interpretation of the quantifier, as with the QCC *ib lub* ‘one CLF.GNRL’ with the noun *zos* ‘village’ in (19).

- (19) [*ib lub*]_{QCC} *zos*
 one CLF.GNRL village
 ‘a village’
 (Cha 1994: 163)

In contrast, nouns can be accompanied by a QCC in a post-nominal position that have a noun classifier in the NP, and the QCC appears in a position that follows all nominal content, including demonstratives. This QCC typically contains a quantifier that indicates distributivity or takes on a partitive interpretation (cf. Simpson 2011). In (20), uttered in a context where a container with a number of identical pens is sitting on a person’s desk, the noun phrase contains the classifier *cov* ‘CLF.PA’, and the QCC *pes tsawg tus* ‘how many CLF.1D.RIGID’ is placed after the entire noun phrase.

- (20) *Koj siv* [*cov cwj.mem no*]_{NP} [*pes.tsawg tus*]_{QCC?}
 2SG use CLF.PA pen this how.many CLF.1D.RIGID
 ‘How many of these pens have you used?’

Note that the demonstrative test is treated in the literature (e.g. Simpson 2005, as mentioned above) as the critical test to determine whether a QCC is indeed inside the NP (i.e., DP in the recent generative literature) in Southeast Asian classifier languages; for

⁵ To be sure, one might raise an objection regarding the topicalization issue; this is addressed in Section 3.2; the parallel example with the transitive object in situ appears in (14).

Hmong, this would indicate that the QCC is NP-external and follows the noun phrase. As presented in Section 1.2, the final elements in the Hmong noun phrase are the demonstrative and an embedded localizer noun phrase, which might suggest NP-external status for the post-nominal QCC, if no other data is considered.

However, evidence from coordination suggests that the NP + QCC together form a noun phrase. When the NP + QCC sequence in (13) is placed in coordination with the noun phrase *Nplog liab* ‘Red (i.e., Communist) Lao’, the result is grammatical:

- (21) *Koj chim rau [cov qub_nom_qub_tswv]_{NP} [txhua tus]_{QCC}*
 2SG be.angry EAM CLF.PA old_official_old_master every CLF.ANIM
thiab [Nplog liab]_{RC}_{NP}.
 and Lao be.red
 ‘You’re angry at all (i.e., every one) of the old government leaders and the Red Lao.’

Since coordination involves two constituents of the same kind, this would provide evidence that the NP + QCC together form a noun phrase.

A second line of evidence comes from pronouns. Replacing *cov qub nom qub tswv txhua tus* ‘all of the old government leaders’ in (13) with *lawv* ‘3PL’ is permitted while retaining the same reference in (22).

- (22) *Koj chim rau [lawv]_{NP}.*
 2SG be.angry EAM 3PL
 ‘You’re angry at them (i.e., all of the old government leaders).’

For (22), the consultant confirmed that *lawv* ‘3PL’ in this instance refers to the whole of *cov qub nom qub tswv txhua tus* ‘all of the old government leaders’. Furthermore, *lawv* ‘3PL’ can also replace the inner NP *cov qub nom qub tswv* ‘the old government leaders’, as in (23).

- (23) *Koj chim rau [lawv]_{NP} [txhua tus]_{QCC}.*
 2SG be.angry EAM 3PL every CLF.ANIM
 ‘You’re angry at all (i.e., every one) of them (i.e., the old government leaders).’

Comparing (22) and (23) provides evidence of a nesting structure indicating that two NPs are involved in (13), each of which can be replaced by a pronoun, as with *lawv* ‘3PL’. Thus, coordination and pronouns each provide independent evidence for constituency, and so the simplest conclusion is that these NP + QCC sequences are themselves noun phrases.

However, two other lines of evidence complicate the picture: usability in isolation and topicalization. For usability in isolation, if the QCC is placed after the noun phrase, the result often cannot appear in isolation, as in the following example.

- (24) *[*kuv xya leej ntXHais*]_{NP} *ib-tug*_{QCC}
 1SG seven CLF.HUMAN daughter one-CLF.ANIM
 Intended: ‘one of my seven daughters’

In the above case, when an utterance was attempted where the noun with its other modifiers and the post-nominal QCC are placed together in isolation, the consultant rejected it, in contrast to the following grammatical example which contains the same sequence in context.

- (25) *muab* [*kuv xya leej ntXHais*]_{NP} *ib-tug*_{QCC} *rau niag*
 give 1SG seven CLF.HUMAN daughter one-CLF.ANIM IOM IMPT
ntshiv.uab
 crow
 ‘give one of my seven daughters to the crow’ (Johnson and Yang 1992: 271)

However, a noun with its modifying content with the quantifier and classifier together in a single noun phrase can generally be uttered in isolation, as in (19) above. With the understanding that the QCC and noun phrase in NQ order forms a single noun phrase constituent, one would expect an example such as (24) to be acceptable, especially in contexts such as in responses to questions; however, this is not the case. In contrast, a nested NP structure with a partitive reading is acceptable if the QCC is placed first, as in (5), repeated below.

- (5) [*ib-tug* [*ntawm kuv xya leej ntXHais*]_{LP}]_{NP}
 one-CLF.ANIM LOCL.nearby 1SG seven CLF.HUMAN daughter
 ‘one of my seven daughters’

In other words, the nested noun phrase here is possible in isolation, if the QCC appears first, but not otherwise. However, having the QCC first in isolation is not automatically acceptable:

- (26) *[*Ob-tug* [*ntawm cov xuam.qhuav no*]_{LP}]_{NP}
 two-CLF.1D.RIGID LOCL.nearby CLF.PA pencil this
 Intended: ‘two of these pencils’

The speaker rejected (26), saying that it was incomplete, requiring a broader utterance, which would make it acceptable.

Returning to NP + QCC, note also that examples in isolation of the construction type in (24) is perfectly acceptable with a pronoun in NP position, as with *lawv* ‘3PL’:

- (27) [*lawv*]_{NP} [*txhua tus*]_{QCC}
 3PL every CLF.ANIM
 ‘all (i.e., every one) of them’

Given the varying acceptability for both QCC + LP and NP + QCC in isolation, the issue here is likely a function of context and the pragmatic requirements of Hmong rather than one of structure.

For topicalization, Hmong does not permit topicalization of a nested noun phrase with the QCC following the internal noun phrase (i.e., NQ ordering). In example (28), the NQ sequence *cov nom coob tus* ‘many of the officials’ appears, while in (29), attempting to insert the (often-ellipsed) topic marker *mas* ‘TOP’, a diagnostic for determining topicalization of what precedes it, fails.

- (28) *Cov nom coob tus muab cov kab.poom nqaij qaib*
 CLF.PA official many CLF.ANIM POM NS CLF.CAN meat chicken

noj tag.

eat finish

‘Many of the officials would eat all the cans of chicken meat.’

- (29) **Cov nom coob tus mas muab cov kab.poom nqaij*
 CLF.PA official many CLF.ANIM TOP POM NS CLF.CAN meat

qaib noj tag.

chicken eat finish

Intended: ‘Many of the officials would eat all the cans of chicken meat.’

However, under the right discourse circumstances, such as a contrastive topic (i.e., a topic selecting a subportion of a group in response to a question, following Lee 2017), a partitive nested noun phrase with the QCC first (i.e., nested QN) and the noun in an LP can appear as a topic. In example (30), in response to a question asking about whether one’s children like to eat spicy food, an implied contrast is made between one of the children, *ib tug ntawm kuv cov me nyuam* ‘one of my kids’, given as topic marked by *mas* ‘TOP’, and an optionally stated set of the other children, *lwm tus* ‘the others’.

- (30) [*Ib-tug [ntawm kuv cov me-nyuam]_{LP}]_{NP} mas, nyiam*
 one-CLF.ANIM LOCL.nearby 1SG CLF.PA little-small TOP like

noj zaub_mov ntsim

eat vegetable_rice be.spicy

‘One of my kids likes eating spicy food (i.e., but the others don’t).’

In contrast to the inability to topicalize NP + QCC sequences, topicalization of the inner noun phrase is fully possible, with the QCC in situ, evidenced again by inserting the topic marker *mas* ‘TOP’. In (31), the nested NQ sequence *cov Hmoob txhua tus* ‘every one of the Hmong’ appears, while in (32), the topic marker *mas* ‘TOP’ is successfully inserted

between *cov Hmoob* ‘the Hmong’ and *txhua tus* ‘each/every one’, indicating that *cov Hmoob* ‘the Hmong’ can serve as topic.

- (31) [Cov Hmoob [txhua tus]_{NP}]_{NP} tuaj Nplog-teb tuaj.
 CLF.PA Hmong every CL.ANIM come Lao-field come
 ‘Every one of the Hmong came from Laos.’

- (32) [Cov Hmoob]_{NP} mas, [txhua tus]_{NP} tuaj Nplog-teb tuaj.
 CLF.PA Hmong TOP every CL.ANIM come Lao-field come
 ‘As for the Hmong, every one (of them) came from Laos.’

To be sure, one might argue that the evidence from (31) and (32) indicates that *cov Hmoob* ‘the Hmong’ is actually the topic in (31) with the topic marker *mas* ellipsed, and *txhua tus* ‘every CL.ANIM’ is the subject, as in (32). However, this topicalization phenomenon does not only apply to subjects such as *cov Hmoob* in (32), but also other arguments such as objects, as shown in (33), where *cov cwj mem no* ‘these pens’ appears in topic position, yet the QCC *pes tsawg tus* ‘how many CLF.1D.RIGID’ remains in situ (cf. (20), where the entire NP + QCC is in situ).

- (33) [Cov cwj.mem no]_{TOP.NP.i} koj siv tas [pes.tsawg tus]_{QCC.i}
 CLF.PA pen this 2SG use finish how.many CLF.1D.RIGID
lawm?
 CP
 ‘How many of these pens have you used?’

Given that this pattern of topicalization applies to both subjects and objects, the simpler analysis is to consider that NP + QCC is the same phenomenon for both types of arguments rather than to posit that NP + QCC in subject position is topic + subject but not in object position where such an analysis is impossible.

Thus, given the evidence above, sequences of NP + QCC are best understood as forming a constituent, though the resulting noun phrase is resistant to topicalization and use in isolation, ostensibly due to reasons of context or pragmatics. As mentioned in Section 2.2, Simpson (2011) provides a “partitive generalization” connecting partitivity and noun phrase-external (DP-external, in his formulation) status of a numeral with definite nouns, and the available data in Hmong reflect this pattern. Moreover, the above evidence does indicate that the partitive/distributive element in the outer noun phrase is indeed outside the noun phrase containing the noun itself, consistent with Simpson (2011), and so a nested noun phrase structure is the best analysis, given the constituent status of both the inner noun phrase containing the noun and the outer noun phrase containing the partitive or distributive quantifier (i.e., the QCC).

These facts are relevant to QF with definite nouns in Hmong, as the QCC in the outer noun phrase can appear in a floated position, such as following *lawm* ‘CP’. Compare (20), repeated here for convenience, with (34): in (20), an NP + QCC pattern appears where the NP *cov cwj mem no* ‘these pens’ is followed by *pes tsawg tus* ‘how many’, which applies a partitive meaning to the NP it follows; however, in (34), the NP *cov cwj mem no* appears in topic position and *pes tsawg tus* ‘how many’ appears in QF position, with the same relation holding between the two constituents.

- (20) *Koj siv [[cov cwj.mem no]_{NP} [pes.tsawg tus]_{QCC}]_{NP?}*
 2SG use CLF.PA pen this how.many CLF.1D.RIGID
 ‘How many of these pens have you used?’

- (34) *[Cov cwj.mem no]_{TOP.NPi} koj siv lawm [pes.tsawg tus]_{QCC.i?}*
 CLF.PA pen this 2SG use CP how.many CLF.1D.RIGID
 ‘(As for) these pens, how many have you used?’

Returning to NP-internal, indefinite QCCs, an alternative NQ ordering can sometimes appear. In example (10), repeated below, the typical QN ordering appears with the noun phrase, *txhua tus Hmoob* ‘every one of the Hmong’.

- (10) *[[Txhua tus]_{QCC} Hmoob]_{NP.SBJ} yeej zoo*
 every CLF.ANIM Hmong certainly be.good
 ‘Every Hmong (person) is good’
 (Mortensen 2015)

In contrast, in example (35), an ostensible NQ ordering appears in the form of *Hmoob txhua tus*.

- (35) *[Hmoob]_{NP} [txhua tus]_{QCC} yeej zoo.*
 Hmong every CLF.ANIM certainly be.good
 ‘As for the Hmong, every one (of them) is good.’

Prima facie, this might suggest that both QN and NQ orderings are available inside a single noun phrase. However, as anticipated by the gloss in (35), evidence from insertion of the (omissible) topicalization marker *mas* ‘TOP’ suggests that this NQ ordering is actually two constituents. Compare (35) with (36) below, where *mas* appears between *Hmoob* ‘Hmong’ and *txhua tus* ‘each/every one’:

- (36) *[Hmoob]_{NP} mas [txhua tus]_{QCC} yeej zoo.*
 Hmong TOP every CLF.ANIM certainly be.good
 ‘As for the Hmong, every one (of them) is good.’

To be sure, one might argue that the relationship between (35) and (36) is parallel to that of the NP and QCC in (31) and (32); however, here there is an important difference: the definite

NP + QCC construction can appear as a constituent in object position, as in (20), but the indefinite noun + QCC pattern is problematic in an unmarked context:⁶

- (37) ??*Nws* *paub* [*Hmoob*]_{NP} [*txhua tus*]_{QCC}.
 3SG know Hmong every CLF.ANIM
 Intended: ‘He knows every Hmong person.’

This suggests that this indefinite noun + QCC pattern is structurally different from the definite NP + QCC structure found in (20), which can be found in object position.

Interestingly, where the indefinite noun + QCC sequence is unacceptable preceding the verb, it is also unacceptable with *mas* inserted. Compare (35) and (36) with (38) and (39) below, where the latter example pair is ungrammatical with and without the topic marker.

- (38) **[Tsheb]*_{NP} [*ntau lub*]_{QCC} *twb* *dhau* *tuaj* *lawm*.
 car many CLF.GNRL already pass come CP
 Intended: ‘As for cars, many had already passed.’
- (39) **[Tsheb]*_{NP} *mas*, [*ntau lub*]_{QCC} *twb* *dhau* *tuaj* *lawm*.
 car TOP many CLF.GNRL already pass come CP
 Intended: ‘As for cars, many had already passed.’

This also is amenable to an analysis of indefinite noun + QCC as simply a sequence of topic and subject, rather than a constituent in their own right, given the consistent grammaticality judgments between the presence vs. absence of *mas*. Altogether, the best analysis for these indefinite noun + QCC sequences is that the noun appears in topic position, and the QCC in situ, rather than a single NP-internal NQ ordering analysis.

Furthermore, single NP-internal QCCs (i.e., as in (10)) can also appear floated, as with *txhua tus* ‘every CLF.ANIM’ in (11), yet the same constituency phenomena described above apply to the floated QCCs themselves exactly as with floated QCCs associated with nested noun phrases: when floated, these QCCs are placed well after the last elements of the NP they modify. These floated elements are best analyzed as appearing in an adverbial syntactic position, as considered below.

⁶ That is, a context where a contrast interpretation is not present, and there are no phonetic cues indicating focus or contrast. Note that if a contrast is proposed, i.e., there is some debate over how many Hmong people the individual knows, then the speaker confirmed that this sentence would be acceptable. In this case, given that the NP-internal ordering *txhua tus Hmoob* ‘every one of the Hmong’ is acceptable here even without a contrast, the post-nominal QCC *txhua tus* is likely an example of QF following the independent object NP *Hmoob* ‘Hmong’, in parallel to (10) and consistent with the contrast analysis for QF presented in §3.6.

3.3 Adverbial syntactic position

In general, adverbs and adverbial expressions in Hmong appear in one of four locations: 1) before the subject NP, 2) between the subject NP and the verb, 3) alternating with the object NP (where the two elements can appear in either order), and 4) after the object. Individual adverbs and adverbial expression types are restricted to a specific location or set of locations, depending on the expression in question (White 2020: 227–229). Two positions of relevance after the object NP can be recognized in relation to the completion/change-of-state marker *lawm* ‘CP’: one immediately preceding *lawm* and the other after, in positions that may be termed pre-completion and post-completion positions, respectively.

The pre-completion and post-completion positions are often associated with adverbial expressions of time and manner using a quantifier with what Gerner (2015) terms “verb classifiers”. Gerner defines these elements as serving the purpose of categorizing or quantifying the verb rather than a noun, and so they serve as an excellent representative of an adverbial expression. His category of “verb classifier” encompasses Hmong time classifiers (or “mensural verb classifiers” in Gerner’s terminology) such as *zaus* ‘CLF.TIME’ and *hnub* ‘CLF.DAY’ as well as what he terms “sortal verb classifiers” such as *suab* ‘VCL.VOICE’ or *phom* ‘VCL.GUNFIRE’.

As adverbial expressions, Q + VCL sequences generally appear in the pre-completion and post-completion positions of the clause.⁷ For example, in (40), the time classifier *hnub* ‘CLF.DAY’ combines with the reduplicated form of *ntau* ‘many’ to form a QCC in the post-completion position after the completion/change of state marker *lawm* to express a time reference.

- (40) *Kuv tau mus lawm [ntau~ntau hnub]QCC...*
 1SG ATT go CP REDUP~many CLF.DAY
 ‘I went for many days...’
 (Cha 1994: 157)

Likewise, in (41), *ntau* ‘many’ combines with the time classifier *zaus* ‘time’ to form a QCC indicating that the event has occurred multiple times, here preceding *lawm* in pre-completion position.

⁷ To be sure, under certain circumstances, certain Q + VCL sequences could appear with a preceding quantifier in a position preceding the verb, such as with *tib-teg* ‘single-VCL.HANDFUL’. However, in cases like these, some evidence is available that another verb such as *ua* ‘do, make’ has in fact been ellipsed from before the Q + VCL, rendering this issue irrelevant for the purposes of the current discussion.

- (41) *Kuv pom koj tuaj rau ntawm qhov chaw no [ntau*
 1SG see 2SG come to LOCL.nearby CLF.DEFAULT place this many
*zaus]*_{QCC} *lawm.*
 CLF.TIME CP
 ‘I’ve seen you come to this place many times.’
 (Cha 1994: 287)

Parallel to these Q + VCL adverbial expressions, QF likewise generally appears in the same two positions, i.e., in the pre-completion and post-completion positions.⁸ In the following examples, the QCC *ntau lub* ‘many CLF.GNRL’ may appear immediately preceding the completion/change of state marker *lawm* in the pre-completion position as well as following it in the post-completion position.

- (42) [*koos.phas xya cov hnab.tsaj*]_{NP.i} *ntuag [ntau lub]*_{QCC.i} *lawm*
 battalion seven CLF.GNRL sack break many CLF.GNRL CP
 ‘many of the seventh battalion’s sandbags had broken’
- (43) [*koos.phas xya cov hnab.tsaj*]_{NP.i} *ntuag lawm [ntau lub]*_{QCC.i}
 battalion seven CLF.GNRL sack break CP many CLF.GNRL
 ‘many of the seventh battalion’s sandbags had broken’
 (Cha 1994: 153)

Note that these positions maintain their relative ordering compared to other elements in the sentence even if *lawm* ‘CP’ does not appear, as with the floated element *txhua tus* ‘each, every one’ in (44), which appears following the intransitive verb *tuaj* ‘come’ in a relative ordering consistent with (42).

- (44) [*Cov Hmoob*]_{NP.i} *tuaj Nplog-teb tuaj [txhua tus]*_{QCC.i}
 CLF.PA Hmong come Lao-field come each CLF.ANIM
 ‘Every one of the Hmong came from Laos.’

As it can be seen, these examples exhibit the same syntactic patterns for QF QCCs as with adverbial Q + VCL sequences, suggesting that the two expression types share their syntactic behavior. In other words, floated quantifiers appear with their classifiers in the same clausal positions as these adverbial expressions. This provides evidence that QF in Hmong is itself an adverbial phenomenon.

Notably, this syntactic pattern is involved with QF regardless of whether the QCC is associated with a nested noun phrase pattern (as analyzed in Section 3.2) or with a single NP-internal QCC pattern; in either case, the QF follows the same adverbial syntax. For the NP-

⁸ Initial evidence suggests that pragmatic factors may play a role in causing certain sentences with similar structures to the examples here to be unacceptable in certain contexts. This is left for further research.

internal case, this is exemplified with floated *ntau lub* ‘many’ in post-completion position following *lawm* ‘CP’ while modifying *tsheb* ‘car’ in (3), compared with *ntau lub* ‘many’ in NP-internal position in (2), repeated below for convenience.

- (2) *Zoo-nkaus* *li* *[[ntau lub]_{QCC} tsheb]_{NP}* *twb* *dhau* *tuaj* *lawm*
 be.like-INTS COMP many CLF.GNRL car already pass come CP
 ‘it seems that many cars had passed’
- (3) *Zoo-nkaus* *li* *tsheb_{NP.i}* *twb* *dhau* *tuaj* *lawm* *[ntau lub]_{QCC.i}*
 be.like-INTS COMP car already pass come CP many CLF.GNRL
 ‘it seems that many cars had passed’
 (Cha 1994: 396)

3.4 Coreference resolution

When QCCs appear in float environments separated from the nouns they modify, multiple possibilities of interpretation could plausibly occur, as the position where the floated QCC appears is ambiguous as regards which argument is involved (i.e., clausal subject, object, and so on). While the available data is limited to determine the parameters by which coreference is disambiguated, some preliminary parameters can be proposed. Generally speaking, resolution of coreference of QCCs is based on two identified parameters: choice of classifier and number. The application of the first two parameters appear in the examples below.

For choice of classifier, in (45), *-puav* ‘some’ appears in a quantifier-classifier combination in the post-completion position after *lawm* ‘CP’, where the selection of the classifier *lub* ‘CLF.GNRL’ provides an indication that the partitive reading should be applied to the zero anaphor inanimate subject rather than to the animate argument represented by *lawv* ‘3PL’ in the topicalized time reference.

- (45) [*Thaum* *lawv_{SBJ}* *muab* *coj* *los* *tuav* $\emptyset_{OBJ}$
 LOCL.when 3PL POM take come.back hold

ntawd]_{TOP} $\emptyset_{SBJ.i}$ *kujtawg* *lawm* *[lub-puav]_{QCC.i...}*
 LOCL.nearby SEQ explode CP CLF.GNRL-some
 ‘When they brought and held them, a few of them exploded...’
 (Cha 1994: 170)

For number, in (34), repeated below, the classifier in the QCC, *tus* ‘CLF.1D.RIGID/ANIM’ is ambiguous as to animate or one-dimensional rigid object reference, but *pes tsawg* ‘how many’ refers to an unspecified number; however, given that the subject pronoun *koj* ‘2SG’ is singular and the topicalized object *cov cwj mem no* ‘these pens’ is non-singular due to the presence of *cov* ‘CLF.PA’, *pes tsawg* ‘how many’ resolves in favor of the

non-singular argument, as the amount represented by the non-singular form is not exactly known while the amount represented by the singular form is.

- (34) [Cov cwj.mem no]_{TOP.i} koj siv lawm [pes.tsawg tus]_{QCC.i?}
 CLF.PA pen this 2SG use CP how.many CLF.1D.RIGID/ANIM
 ‘(As for) these pens, how many have you used?’

As it can be noted in the above examples and consistent with the discussion in Section 3.1, floated quantifiers are always interpreted as associated with the arguments of a verb. As QF can apply to QCCs modifying any core argument despite appearing in the same surface syntactic positions, this reinforces the adverbial analysis above, as the positions in question are not straightforwardly associated with one or another of the core arguments without reference to some other phenomenon.

3.5 Co-occurrence of quantifiers in two positions with different readings

One critical aspect of the classifier system of Hmong related to QF is that a definite noun may be classified twice (as anticipated in Section 3.2), where one classifier performs a typical bare noun classifier function to indicate definiteness within the inner NP and the second, outer NP classifier accompanies a quantifier to signal partitivity (cf. Simpson’s 2011 partitive generalization) or distributivity. In (25), repeated below, the noun *ntxhais* ‘daughter’ is classified by *leej* ‘CLF.HUMAN’ within the noun phrase, and by *tus* ‘CLF.ANIM’ in its bound lexical tone sandhi variant *-tug* in the QCC; the combination (with classifiers in bold below) produces a partitive reading.

- (25) *muab* [[*kuv* *xya* ***leej*** *ntxhais*]_{NP} ***ib-tug***_{QCC}]_{NP} *rau* *niag*
 give 1SG seven CLF.HUMAN daughter one-CLF.ANIM IOM IMPT

ntshiv.uab
 crow
 ‘give one of my seven daughters to the crow’
 (Johnson and Yang 1992: 271)

In (46), *Hmoob* ‘Hmong’ is classified by *cov* ‘CLF.PA’ inside the noun phrase, and by *tus* ‘CLF.ANIM’ in the QCC, where a distributive reading applies.⁹

- (46) [***Cov*** *Hmoob*]_{NP} [*txhua* ***tus***]_{QCC} *tuaj* *Nplog-teb* *tuaj*
 CLF.PA Hmong each CLF.ANIM come Lao-field come
 ‘Every one of the Hmong came from Laos.’

⁹ Some evidence also suggests that cardinality involving *tib-leej* ‘single-CL:HUMAN’ and similar expressions with the meaning ‘alone’ is possible with NP-external syntactic behavior with certain verbs such as *tshuav* ‘remain, be left’; this evidence suggests that there may be QF versions of these as well.

Likewise, in (47), a distributive reading applies when the definite NP *cov neeg ntawd* ‘those people’ is modified by the floated *txhua tus* ‘each (one)’.

- (47) [**Cov** *neeg* *ntawd*]_{NP.i} *yuam* *kev*_O [*txhua* **tus**]_{QCC.i.}
 CLF.PA person LOCL.nearby mistake way each CLF.ANIM
 ‘Each of those people has made a mistake.’

In these last two cases, the bare classifier *cov* ‘CLF.PA’ straightforwardly indicates definiteness in the NP.

This phenomenon is significant in that nouns generally cannot be classified by two classifiers at the same time in Hmong (Ratliff 1991).¹⁰ To be sure, one might argue that the examples with the quantifier *txhua* ‘each’ in (46) and (47) indicate that two classifiers are possible when *txhua* appears. However, within a single noun phrase, *txhua* ‘each’ occurs with exactly one classifier, as in (10), repeated below.

- (10) [[*Txhua* *tus*]_{QCC} *Hmoob*]_{NP.SBJ} *yeej* *zoo*
 every CLF.ANIM Hmong certainly be.good
 ‘Every Hmong (person) is good’
 (Mortensen 2015)

The presence of two classifiers within a nested partitive construction indicates that two distinct classifier functions are present. The first involves considerations of definiteness: the immediately pre-nominal, single NP-internal position is generally associated either with QCCs that accompany indefinite nouns or occasionally definite nouns where number is emphasized and indicates cardinality, or with bare noun classifiers indicating definiteness or referential salience (see Riddle 1989; Simpson et al. 2011); classifiers that co-occur with demonstratives or possessive NPs may also appear here (see Bisang 1993; White 2019). The other function associates with the outer NP position in a nested NP structure, reserved for those QCCs that accompany definite nouns indicating partitivity/distributivity. Either of the two roles can be associated with the quantifier float phenomenon, as QF is associated with QCCs that may otherwise (i.e., when QF is not present) appear either in the pre-nominal, single NP-internal position, indicating cardinality, or in the outer NP position of a nested NP, indicating partitivity/distributivity.

¹⁰ Specifically, Ratliff (1991) and Bisang (1993) discuss phenomena related to apparent co-occurrence of classifiers; at least two hypotheses could potentially be proposed: 1) certain classifiers used to disambiguate a noun may co-occur with a non-singular classifier, and 2) the disambiguating classifier is becoming a class noun in those contexts. In any case, both authors opt for the class noun interpretation. Otherwise, this would constitute the only other known exception.

3.6 Scope and focus

Jenks (2013a) reveals an important difference in scope for quantifiers in Thai: subject quantifiers scope above negation and object quantifiers below, but floated quantifiers can scope above or below negation regardless of whether the argument they modify is subject or object. Compare the following Thai examples involving the subject noun *nák-riian* ‘student’ and the universal quantifier *thúk-* ‘every’:

- (48) a. *nák-riian thúk-khon (yaŋ) mâj kin khâaw*
 student every-CLF still NEG eat rice
 ‘Every student still hasn’t eaten.’ $\forall > \neg, * \neg > \forall$
- b. *nák-riian (yaŋ) mâj kin khâaw thúk-khon*
 student still NEG eat rice every-CLF
 ‘Every student still hasn’t eaten.’ $\forall > \neg, \neg > \forall$
 (Jenks 2013a: 6)

While Hmong does not frequently combine negation with quantifier float, when it does, Hmong exhibits the same pattern with a subject and the universal quantifier *txhua* ‘each/every’: as a subject quantifier, it scopes above negation in situ, but may scope above or below negation when floated.¹¹ In example (49), *txhua tus* ‘each/every one’ appears in the subject noun phrase, where it scopes over negation, while in (50), *txhua tus* ‘each/every one’ appears in QF position modifying the coordinate compound noun *tub ntshais*, where it can scope above or below negation.¹²

- (49) *[[Koj cov tub_ntshais]NP [txhua tus]QCC]NP tsis hais lus Hmoob.*
 2SG CLF.PA son_daughter every CLF.ANIM NEG speak speech Hmong
 ‘None of your children speak Hmong.’ $\forall > \neg, * \neg > \forall$
- (50) *[Koj cov tub_ntshais]NP tsis hais lus Hmoob [txhua tus]QCC.*
 2SG CLF.PA son_daughter NEG speak speech Hmong every CLF.ANIM
 ‘None of your children speak Hmong.’ $\forall > \neg$
 ‘Some of your children speak Hmong.’ $\neg > \forall$

Like Japanese (Nakanishi 2008), Thai (Simpson 2011; Jenks 2013a), and Burmese (Simpson 2011), quantifier float in Hmong associates with focus. This is most obvious with quantity questions with a quantifier such as *pes tsawg* ‘how many’, placed in QF position, where the corresponding answer can contain just the QCC itself with the rest of the clause ellipsed, as with *txhua tus* ‘each/every one’ in the example below.

¹¹ Available evidence is insufficient for determining the scope of *txhua* ‘each/every’ with objects.

¹² The acceptability of the two possible meanings here often depends on context, but both with their corresponding translations have been confirmed when the appropriate context is supplied.

(51) Q: [Hmoob]_{NP} nyiam noj cov zaub_mov ntsim
Hmong like eat CLF.PA vegetable_rice be.spicy

[pes.tsawg tus]_{QF?}
how.many CLF.ANIM
'How many Hmong like to eat spicy food?'

A: Txhua tus.
every CLF.ANIM
'Every one.'

Likewise, as in Thai (Jenks 2013a: 11), a floated quantifier can permit ellipsis in fragment answers. In Hmong, a positive answer to a neutral polar question can take the form of repeating the verb from the question, as in the example below.

(52) Q: Puas yog ua li no_{PH?}
Q be.correct do like this
'Is it correct to do it like this?'

A: Yog.
be.correct
'It's correct.'

As the response to a question, the answer is comprised of the new information, which is repeated to indicate confirmation, exactly consistent with Jenks's observation for Thai. In parallel, where *txhua tus* 'each/every one' is focused information in a polar question (and so floated), a positive answer may contain *txhua tus* in QF position:

(53) Q: [Koj cov tub_ntxhais]_{NP} puas hais lus As Kiv
2SG CLF.PA son_daughter Q speak speech English

[txhua tus]_{QF?}
every CLF.ANIM
'Does every one of your children speak English?'

A: Hais [txhua tus]_{QF}.
speak every CLF.ANIM
'Every one (of them) speaks it.'

Altogether, given that 1) wh-expressions such as *pes tsawg* + CL 'how many CL' and their corresponding answers are expressions of focus, and 2) polar questions asking specifically about the totality of a number likewise place in focus that totality in question and answer, a focus analysis for QF in Hmong is adopted here.

4 Discussion: Jenks' typological generalization and Hmong

As discussed in Section 2.1, Jenks proposes a typological distinction between quantifier-noun languages and noun-quantifier languages. Critically, he associates the possibility of bare classifiers with QN, and quantifier float with NQ.

As demonstrated above, Hmong has quantifier float and a permissible NQ pattern where this NQ pattern takes the form of a noun phrase nested inside another, where the Q is in the outer noun phrase, and this structure indicates partitivity/distributivity. The equivalent QN order, made up of a QCC + LP, likewise contains two nested noun phrases, the quantifier is in the outer phrase, and the result indicates partitivity/distributivity. Example (46) exemplifies this NQ pattern, in that *Hmoob* 'Hmong' is modified by the QCC *txhua tus* 'each CLF.ANIM', where the noun phrase and QCC appear together in a nested structure; the QF version appears in (54), where *txhua tus* is floated away from the noun phrase *cov Hmoob* 'CLF.PA Hmong', where the noun phrase retains the definite reading.

- (46) [[*Cov Hmoob*]_{NP} [*txhua tus*]_{QCC}]_{NP} *tuaj Nplog-teb tuaj*
 CLF.PA Hmong each CLF.ANIM come Lao-field come
 'Every one of the Hmong came from Laos.'

- (54) [*Cov Hmoob*]_{NP.i} *tuaj Nplog-teb tuaj* [*txhua tus*]_{QCC.i}
 CLF.PA Hmong come Lao-field come each CLF.ANIM
 'Every one of the Hmong came from Laos.'

At first glance, this corresponds to Jenks's generalization. Interestingly, however, this NQ pattern (and its QN equivalent) in Hmong limits nouns to a definite reading, signaled by a second, bare classifier inside the inner noun phrase, as with the bare classifier *cov* 'CLF.PA' in (46) and (54). This presence of a bare classifier with the noun in the inner noun phrase conflicts with Jenks's (2010) generalization that languages that permit an NQ pattern (and therefore QF) do not also allow a bare classifier + noun sequence within a noun phrase.

Furthermore, not only does Hmong permit bare quantifiers with a noun in a NP, critically, it also permits QF with quantifiers associated with the quantifier position within a single noun phrase, where the noun takes an indefinite reading and the quantifier indicates (relative) cardinality. When QF applies, the quantifier and corresponding classifier—which could otherwise serve as a bare classifier if a quantifier does not appear—appear floated. Examples (2) and (3) represent this QF alternation associated with the single NP QN order: in (2), *ntau lub* 'many CLF.GNRL' appears inside the noun phrase with indefinite reference, while in (3), *ntau lub* appears floated outside the noun phrase with the same function, where *tsheb* 'car' retains an indefinite reading.

- (2) *Zoo-nkaus li [[ntau lub]_{QCC} tsheb]_{NP} twb dhau tuaj lawm*
 be.like-INTS COMP many CLF.GNRL car already pass come CP
 ‘it seems that many cars had passed’
- (3) *Zoo-nkaus li [tsheb]_{NP.i} twb dhau tuaj lawm [ntau lub]_{QCC.i}*
 be.like-INTS COMP car already pass come CP many CLF.GNRL
 ‘it seems that many cars had passed’
 (Cha 1994: 396)

This creates a curious situation for Jenks’s (2013b) quantifier float generalization, restated here:

(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. (Jenks 2013b: 2)

This generalization still technically holds, but not for the reason expected: the noun phrase-internal order NQ, while permitted in Hmong in a partitive/distributive function, does not account for every instance of QF, including that in (3), as the basic, non-QF sentence in (2) is a canonical QN pattern that could permit a bare classifier, as in (55).

- (55) *[Lub tsheb]_{NP} twb dhau tuaj lawm.*
 CLF.GNRL car already pass come CP
 ‘The car had passed.’

For Hmong, the indefinite/definite distinction is relevant: bare noun classifiers, which appear without a quantifier and indicate definiteness (Simpson et al. 2011), never appear in float positions away from their head noun. This in itself is not surprising, but more significantly, singular definite nouns in Hmong take the same classifier, whether as a bare noun classifier or a numeral classifier, while non-singular definite nouns have different classifiers for each of the two functions (as Jenks (2010) also mentions for Vietnamese).

Thus, in some sense, the system of numeral classifiers, and thus QCCs, involved in quantifier float is actually distinct to some extent from that of bare noun classifiers. In his typological generalizations, Jenks regards noun classifiers as belonging to one pattern, and quantifier float to another, and this is borne out with the classifier phenomena involving definite nouns in Hmong. Thus, as it interacts with the two syntactically distinct associations discussed in Section 3.5, with definite nouns, the post-nominal (i.e., outer NP) position is associated with quantifier float, much as it is in NQ languages, while the pre-nominal (i.e., inner NP) position is not. This contrasts with indefinite nouns, where QN is associated with quantifier float with certain quantifiers.

Considered from another angle, consistent with Downing's (1996) observations regarding specificity and numeral classifiers in Japanese and Huang and Ochi's (2014) larger discussion for Japanese and Chinese, Hmong QF involves a numeral classifier that itself always provides non-specific (and therefore indefinite) reference, whether the head noun is definite or indefinite. As seen in Section 3.5, this non-specific indefinite reference provided by the floated quantifier + numeral classifier is resolved as partitivity if the noun is definite and so co-occurs with a bare classifier, much as if it had appeared in the nested NP next to the noun, paralleling Jarkey & Komatsu's (2019) observation for Japanese. The non-specific reference associated with QF modifying indefinite nouns produces no such conflict, and is therefore resolved in a manner similar to if the quantifier had appeared in the noun phrase itself, explaining the apparent lack of a change of reading.

Finally, as Hmong is the first language to attest QF for a QN-only pattern with a single NP structure, i.e., one that also permits bare classifiers to appear alone (i.e., without the quantifier) within it, this is significant for the larger typology. Most importantly, as discussed above, QF for this pattern involves indefinite reference. Critically, this is consistent with Kang's (2002: 385) contention for Korean that indefiniteness forms part of QF semantics, as well as Jenks's (2013a: 6) considerations regarding the Thai indefinite quantifier *sák*, despite involving a QN-only pattern. This indicates that indefiniteness may be involved with QF regardless of whether NQ or QN ordering applies.

5 Conclusion

The analysis above is the first to recognize quantifier float phenomena in a Hmong-Mien language. As the evidence shows, not only does Hmong have quantifier float, it contrasts with other languages in the literature in that it attests both QF and bare classifiers.

Moreover, it has QF that pertains to two distinct syntactic associations involving definiteness and ordering. The first is a definite pattern associated with a permitted NQ ordering that matches the typological generalizations found specifically in Jenks (2010), except that a bare noun classifier is present in the inner NP, which Jenks does not anticipate. The second is an indefinite one associated with QN-only ordering where the numeral classifier appears in the same position as a bare noun classifier associated with definiteness, and where the same classifier may serve in either role. Both of these points involving bare noun classifiers is significant for the emerging typology of quantifier float in East and Southeast Asian classifier languages, as quantifier float associated with a single NP-internal QN-only ordering is not currently predicted. This suggests ultimately that the relative order of quantifier and noun within a single noun phrase alone does not determine whether

“rightward” quantifier float can occur in a classifier language, and, more importantly, that the underdocumented classifier languages in the region and elsewhere require significantly more descriptive attention to ensure the typology of quantifier float in classifier languages can reach explanatory and predictive adequacy.

Likewise, the evidence from Hmong presents interesting implications as regards NP nesting and partitivity. Specifically, while quantifiers associated with the nested NP NQ ordering typically indicate partitivity or distributivity, in line with Simpson (2011), Hmong also permits “rightward” floating quantifiers that quantify over indefinite nouns in an NP-external position but which are associated with an NP-internal position in non-float contexts.

Finally, in regard to ongoing debates about the status of quantifier float syntactically, the available evidence in terms of constituency, syntactic position, and syntactic ambiguity of argument coreference suggest an adverbial status for QF in Hmong, where QF, when present, serves in a focus role, similarly to Thai.

Ultimately, the presence of both QF and bare classifiers in Hmong and the indefinite and definite (and therefore partitive/distributive) patterns of the classifier system recognized above have significant implications for the existing typology, indicating that additional research on quantifier float in Hmong, other Hmong-Mien languages, and other underdocumented classifier languages should play a significant role in further research.

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