The structures of quantifier phrases in Thai are studied in the X-Syntax framework. Syntactic and semantic arguments are provided to prove that this model remedies the deficiency of traditional and early transformational grammar as it provides insightful analyses based on distinctions between intermediate level nodes that display internal hierarchical structures as well as the linear structure of the phrase. This leads to an account of the different meanings of the structure itself. (Author)
A Study of Quantifier Phrases in Thai

Phawadee Deephuengton

Abstract: The structures of quantifier phrases in Thai are studied in the X-Syntax framework (Jackendoff 1977). Syntactic and Semantic arguments are provided to prove that this model remediates the deficiency of traditional and early transformational grammar as it provides insightful analyses based on distinctions between intermediate level nodes which display internal hierarchical structures as well as the linear structure of the phrase. In addition, this leads to an account of the different meanings of the structure itself.

A quantifier phrase in Thai always has a noun as its first element.

\[ \text{NP} \quad \text{cloth} \quad \text{three} \quad \text{class.} \quad \text{the first} \]

The quantifier phrase is somehow embedded in the NP. We cannot yet classify the constituents within this NP because we have to provide arguments for it whether syntactic or semantic. However, if we attempt to diagram the NP in (1) as follows:

we will encounter a number of immediate problems, i.e., this model provides only the most meager structural framework for the syntactic units. Quite clearly, we cannot suspend all the constituents in (1) from the same node. Such an analysis ignores the fact that the NP has internal hierarchical structure as well as a linear structure which can account for potentially different meanings of the structure itself.
because one might argue that this NP may mean ‘the three first meters of cloth’ or ‘three meters of the first cloth,’ etc. rather than ‘the first three meters of cloth.’

To see this clearly, consider the quantifier phrase in (2a) and its associated diagram (2b) provided by the phrase structure rule.

(2) a. kâ:w sã:m bai
glass three class.

three glasses

b. 

Empirical arguments to support the position that the quantifier phrase is embedded and attached at a different level within the NP are provided by using standard constituent structure ‘tests’: deletion, substitution, and conjunction.

(3) a. da:ŋ mi: kâ:w sã:m bai
Dang have glass three class.

Dang has three glasses.

b. da:ŋ mi: kâ:w thâurai
Dang have glass how many

How many glasses does Dang have?

c. da:ŋ mi: e sã:m bai
Dang have three class.

Dang has three.

In (3b) sã:m bai can be substituted for thâurai in response to questions, and in (3c) which is the answer to (3b) the word kâ:w (glass) has been left out as the understood constituent (e). sã:m bai can occur alone without its head noun kâ:w.
This proves that sāːm bai constitutes a constituent. It is an ‘internal unit’ within its own phrase (NP): kāː:w sāːm bai

(4) a. dæ:ŋ miː kāː:w sāːm bai  
   Dang have glass three class.
   Dang has three glasses.

b. dam kɔː miː e sāːm bai  
   Dam also have three class.
   Dam also has three.

c. *dam kɔː miː e sāːm phĩːn  
   Dam also have three class.
   Dam also has three.

(4c) shows additional evidence that kāː:w has been deleted from the NP due to the ungrammaticality of the sentence. phĩːn is the classifier used with sīa (mat). The native speaker intuitively knows that the deleted unit is kāː:w (glass) not sīa (mat). If phĩːn is unacceptable in (4c), it clarifies the point that there is something deleted or else every classifier could be used in this slot without making the sentence unacceptable. This can be accounted for by a co-occurrence restriction, i. e., the head noun in NP selects its classifier; for instance, kāː:w selects bai, sīa selects phĩːn etc.

From the arguments proposed, we may tentatively claim that the NP kāː:w sāːm bai has the structure below:

(5)

This diagrammatic representation in (5) has not yet clearly displayed how the constituents are attached at the different levels as to show larger phrasal expansions
of a given head constituent. I adopt the system of X'-Syntax to label the different
level attachments as follows:

(6)

\[
\begin{array}{c}
\text{kæk:w} \\
\text{N'} \\
\text{QP'} \\
\text{N''}
\end{array}
\]

In (6) kæk:w is under N' node because it is a head noun and its projection to N''
denotes the larger phrasal expansion. QP' modifies N', thus it attaches to the N''
node and expands the scope of N' into N'' which corresponds to the traditional
category of NP.

Another syntactic argument to support that kæk:w of N' is definitely separated
from QP' can be seen from the evidence in (7).

(7) a. kæk:w anjkrit sā:m bai
     glass English three class.
     three English glasses

b. dae:ŋ mi: kæk:w anjkrit thâuurai
     Dang have glass English how many
     How many English glasses does Dang have?

c. dae:ŋ mi: e sā:m bai
     Dang have three class.
     Dang has three.

d. *dae:ŋ mi: e sā:m bai anjkrit

(7c) shows that the whole chunk of kæk:w anjkrit can be deleted. This means that
ankrit goes together with N kæk:w not QP' sā:m bai. That is why when we
move the element anjkrit and attach it with QP' sā:m bai in (7d), the sentence
becomes unacceptable. Moreover, it is even clearer to see the evidence in the
diagrammatic structure in (8) and (9).
(8) is the structure associated with (7a). (9) is ruled out because it violates the 'no crossing of branches' restriction. (8) contains no crossing branches, and thus is well-formed. This argument strongly supports placing \( kā:w \) at the N' level and \( sā:m \) \( bai \) of the QP at the N" level.

A further argument to support the prediction about the different nodes of N' and N" can be captured by using the conjunction test.

\[
\text{(10) } dā:m \ mi: \ chó:n \ lāe \ sō:m \ an'krit \ sā:m \ khan
\]

Dang has three English spoons and forks.

In (10) the noun \( chó:n \) (spoon) and \( sō:m \) (fork) select the same classifier \( khan \) so they can be conjoined under the same node as displayed in the tree diagram (11).

\[
\text{(11) }
\]

On the other hand, if the nouns do not select the same classifier, they cannot be conjoined under the same node. Let's look at the structure in (12) and its associated diagram (13) to elucidate the point.
(12)  $da\text{ː}n$  $mi\text{ː}t$  $an\text{ː}krit$  $sä\text{ː}m$  $lêm$
Dang have knife English three class.

$lê$  $sô\text{ː}m$  $an\text{ː}krit$  $sä\text{ː}m$  $khan$
and fork English three class.

Dang has three English knives and forks.

(13)

From (13), we can see that if the nouns do not select the same classifier, there will be a repetition of the $N''$. The super $N$-double-prime has to be proposed in this case.

The data of the quantifier phrases I have provided so far is not exhaustive. As a matter of fact, there can be more elements attached within the quantifier phrase. I categorize all the elements that can occur within the quantifier phrase in the following table.
> Syntactic functions  Quantification premodifiers  Head  Quantification postmodifier

<table>
<thead>
<tr>
<th>Types of words</th>
<th>Padv.</th>
<th>Degree word</th>
<th>QW</th>
<th>DW</th>
<th>Classifier</th>
<th>Residual</th>
<th>Seminumeral</th>
<th>Postadv.</th>
<th>word</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examples</td>
<td>ʔ:k</td>
<td>sāk</td>
<td>1-9</td>
<td>sip</td>
<td>bai</td>
<td>kwāː</td>
<td>rāː:k</td>
<td>'the first'</td>
<td>thāunān</td>
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<tr>
<td></td>
<td>'again'</td>
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<td></td>
<td>kheː'just'</td>
<td>kriŋ 'the tenth'</td>
<td>classifier</td>
<td>'plus'</td>
<td>thānːŋ</td>
<td>'only'</td>
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<td></td>
<td>phiaŋ 'half'</td>
<td>rāːi for glass'</td>
<td>kriŋ</td>
<td>thānːi</td>
<td>phoːdi:</td>
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<tr>
<td></td>
<td>chiaːt</td>
<td>khɔːn 'the hun-phān'</td>
<td>'half'</td>
<td>'the last'</td>
<td>'exact'</td>
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<tr>
<td></td>
<td>jiaːp</td>
<td>almost'three dreds'classifier</td>
<td>sēːt</td>
<td>amount'</td>
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<td>kiaːp</td>
<td>fourth' phaːn for mat'</td>
<td>'residue'</td>
<td>thūan</td>
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<td>riaːm</td>
<td>bāːŋ 'the thou-lēm'</td>
<td>'exact'</td>
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<td></td>
<td>nāp</td>
<td>'certain' sands'classifier</td>
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<td></td>
<td>thiaː</td>
<td>'up to' laːi min for knife'</td>
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<td>riaːm</td>
<td>many, 'the ten' khan</td>
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<td>thūk</td>
<td>'all, much'thousands'classifier</td>
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<td></td>
<td>thiaː</td>
<td>every' prāmaːn sēːn for spoon'</td>
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<td></td>
<td>kiaːn</td>
<td>'more about' 'the hundred</td>
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<td>than' 'the hundred</td>
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<td>than' thousands'</td>
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<tr>
<td></td>
<td></td>
<td>láːn 'the millions'</td>
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</tbody>
</table>

QW = Quantity word

DW = Digital word

At this point, I claim that the classifier functions as the head of the quantifier phrase. The argument to support this claim is as follows:

(14) a. daːŋ miː kāː:w thāurai
Dang have glass how many

How many glasses does Dang have?
In (14b), which is the answer to (14a), the classifier bai substitutes for thâurai. The quantity word (cardinal) can be deleted. We have already shown that N kâ:w is a separate node from the QP' from the previous argument. Now, we are going to concentrate only on the QP (e bai). Since the quantity word can be deleted, it is obvious that there must be some internal structure within the QP itself. Nonetheless, note that the cardinal deleted here is only the number 'one.' When the QP is expressed only with the classifier, the number of objects perceived intuitively by the native speaker is only 'one.' As far as the evidence is expressed, we may have to re-diagram the structure as follows:

In (15) bai is the head of the quantity phrase under QP' and its projection to QP'' denotes the larger phrasal expansion. QW modifies QP', thus it comes off QP'' node and expands the scope of QP' into QP'' which corresponds to the category QP.

I will see how the elements of the quantifier phrase get attached to the head of the quantifier phrase.

(16) kâ:w khâ: sâ:m bai
glass just three class.

just three glasses
We do not know how *khâ:* gets attached to *sâ:m bai*. The way to proceed is to try a constituent structure test.

(17) a. *dæ:ŋ mî: kâ: w khâ:* sâ:m bai
    Dang have glass just three class.
    Dang has just three glasses.

b. *dæ:ŋ mî: khâ:* _thâurai_ ná (echo question)
    Dang have just how many particle
    Dang has just how many?

c. *dæ:ŋ mî: e sâ:m bai*

The native speaker’s perception of the answer to an echo question and a common question is quite different. (17c) is an answer to the echo question (17b) in which the native will perceive the missing element as *khâ:* (cf. a common question in (3b) and its associated answer (3c). This proves that *khâ:* must be attached to another level as follows from the previous deletion test so far. The following tree diagram represents the structure for *kâ: w khâ:* sâ:m bai

(18)

(19) *kâ:w ?i:k khâ:* sâ:m bai
    glass again just three class.
    just three more glasses

In (19), again, we will find the argument where *?i:k* is attached to by using the same test.
(20)  

a. \( dæːŋ \ miː \ kækːw \ ?ːk \ khâː \ sāːm \ bai \)
   Dang have glass again just three class.

Dang has just three more glasses.

b. \( dæːŋ \ miː \ ?ːk \ khâː \ thâuːrai \ ná \) (echo question)
   Dang have again just how many particle

Dang has just how many more?

c. \( dæːŋ \ miː \ e \ khâː \ sāːm \ bai \)

In (20c), the deleted element is perceived as \( ?ːk \). Consequently, \( ?ːk \) must be attached to another level within the phrase. Nonetheless, we might notice that \( sāːm, \ khâː, \ ?ːk \) have the same function within the phrase, i.e., they modify the head classifier. Moreover, they are optional elements and recursive. (21) represents (19).

(21)

(22) \( kækːw \ sāːm \ bai \ thâuːnán \)
   glass three class. only

only three glasses

In (22), \( thâuːnán \) occurs after the head classifier. We still have to adopt the same test to see how \( thâuːnán \) interacts within the QP.

(23)  

a. \( dæːŋ \ miː \ kækːw \ sāːm \ bai \ thâuːnán \)
   Dang have glass three class. only

Dang has only three glasses.
b. *daːŋ mi: kiː bai thûnân ná* (echo question)
Dang have how many class. only participle
Dang has how many only?

c. *daːŋ mi: sãːm bai e*

In the same fashion, the deleted element in (23c) is understood as *thûnân* So it must be attached at another level. The only difference from *ʔiːk*, and *khêː* is that it is postmodifier.

(24)

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(24) represents the diagrammatic structure of (22).
```

(25) *kæːw khêː sãːm bai thûnân*
glass just three class. only
just only three glasses

(26) *kæːw ʔiːk khêː sãːm bai thûnân*
glass again just three class. only
just only three more glasses

From (25) and (26), we will use the same deletion test and put them in the tree diagrams.

(27) a. *daːŋ mi: kæːw khêː sãːm bai thûnân*
Dang have glass just three class. only
Dang has just only three glasses.
b. dae:ŋ mi: khâ: kì: bai thàunán ná (echo question)
Dang have just how class. only particle
many
Dang has just how many only?

c.  

(28) a.  

dae:ŋ mi: kâ:w ñik khâ: sâ:m bai thàunán
Dang have glass again just three class. only
Dang has just only three more glasses.

b.  

dae:ŋ mi: ñik khâ: kì: bai thàunán ná (echo question)
Dang have again just how class. only particle
Dang has just only how many more?

c.  

(29)

N''

| N'

Q P''

| Postadv.

QP'

| Deg.

kâ:w thàunán

khâ:

sâ:m class.

(30)

N''

| bai

N'

| N

Q P''

| Postadv.

QP'

| Preadv.

kâ:w thàunán

?í:k Deg.

khâ:

sâ:m class.

bai
(29) and (30) represent (25) and (26) respectively. It is needless to repeat the same explanation as to how thâunán is attached within the QP. But the obvious evidence that supports why the postadverb comes off the QP and modifies the whole chunk of sâm bai, khê: sâm bai, and ?i:k khê: sâm bai underscored in (23c), (27c), and (28c) respectively, is that we have to repeat every element before the empty element thâunán.

(31)  phâ: sip mé:t kwâ:  
cloth ten class. plus  
ten meters of cloth plus

In (31), kwâ: is one of the postmodifiers and acts the same way as thâunán.

(32)  a. dae:n mi: phâ: sip mé:t kwâ:  
Dang have cloth ten class. plus  
Dang has ten meters of cloth plus.

b. dae:n mi: kî: mé:t kwâ: ná (echo question)  
Dang have how class. plus particle many  
Dang has how many plus?

c. dae:n mi: sip mé:t e

If we attach khê: and ?i:k khê: to (31) and go through the deletion test we will get:

(33)  a. dae:n mi: khê: sip mé:t e

b. dae:n mi: ?i:k khê: sip mé:t
(34)

\[
\begin{array}{c}
N'' \\
| \\
N \\
| \\
Q_P' \\
| \\
Postadv. \\
\end{array}
\]

\[
\begin{array}{c}
phâ: \\
| \\
Q_W \\
| \\
Q_P' \\
| \\
klass. \\
\end{array}
\]

\[
\begin{array}{c}
sip \\
| \\
mé:t \\
\end{array}
\]

phâ: sip mé:t kwâ:

(35)

\[
\begin{array}{c}
N'' \\
| \\
N \\
| \\
Q_P' \\
| \\
Postadv. \\
\end{array}
\]

\[
\begin{array}{c}
phâ: \\
| \\
Deg. \\
| \\
Q_P' \\
| \\
kwâ: \\
\end{array}
\]

\[
\begin{array}{c}
khâ: \\
| \\
Q_W \\
| \\
Q_P' \\
| \\
klass. \\
\end{array}
\]

\[
\begin{array}{c}
sip \\
| \\
mé:t \\
\end{array}
\]

phâ: sip mé:t kwâ:

(36)

\[
\begin{array}{c}
N'' \\
| \\
N \\
| \\
Q_P' \\
| \\
Postadv. \\
\end{array}
\]

\[
\begin{array}{c}
phâ: \\
| \\
Predadv. \\
| \\
Q_P' \\
| \\
kwâ: \\
\end{array}
\]

\[
\begin{array}{c}
?i:k \\
| \\
Deg. \\
| \\
Q_P' \\
| \\
khâ: \\
| \\
Q_W \\
| \\
Q_P' \\
| \\
klass. \\
\end{array}
\]

\[
\begin{array}{c}
sip \\
| \\
mé:t \\
\end{array}
\]

phâ: ?i:k khâ: sip mé:t kwâ:
We know that the postadverb \textit{kwa}: attaches to the QP'' and modifies the whole QP' \textit{?i:k kh\&: sip m\&:t} from the evidence in (32c), (33a), and (33b) such that we have to repeat every element before the empty element \textit{kwa}:

\begin{equation}
\text{ph\&: } \textit{?i:k kh\&: sip m\&:t kwa: th\&un\&n}
\end{equation}

\begin{center}
cloth again just ten class. plus only
\end{center}

only just ten more meters of cloth plus

(37) represents the quantifier phrase which contains the most elements. (38) is its associated diagrammatic representation.

\begin{equation}
\text{(38)}
\end{equation}

\begin{center}
\text{The argument to support placing th\&un\&n in the outermost layer of the quantifier phrase is from the evidence in (39) below:}
\end{center}

\begin{equation}
\text{(39)}
\end{equation}

\begin{enumerate}
  \item \text{d\&en mi: ph\&: ?i:k kh\&: sip m\&:t kwa: th\&un\&n}
  \begin{center}
  Dang have cloth again just ten class. plus only
  \end{center}

  Dang has only just ten more meters of cloth plus.

  \item \text{d\&en mi: ?i:k kh\&: ki: m\&:t kwa: th\&un\&n (echo question)}
  \begin{center}
  Dang have again just how class. plus only particle many
  \end{center}

  Dang has only just how many plus?
\end{enumerate}
c.  
\[ \text{Dāng mi: ?ī:k khā: sip mė:t kwā: e} \]
Dāng have again just ten class. plus
Dāng has just ten plus.

In (39c), we have to repeat every element before the empty element thâu nán. Hence, thâu nán is the outermost layer of the QP. Moreover, there are no phrase like (40) which is additional evidence to prove the status of thâu nán.

(40)  
*phā: sip mė:t thâu nán kwā:  
cloth ten class. only plus

If we use brackets to show the constituents, it goes as follows:

(41)  
\[ [\text{phā:} \left[ \left[ ?ī:k \left[ \text{khā:} \left[ \text{sip} \left[ \text{mė:t} \right] \right] \right] \right] \text{kwā:} \right] \text{thâu nán} \] \]

(41) a.

(41a) is the modified tree diagram from (38). The reason why the postadverb kwā: attaches to QP' is that kwā: modifies the whole chunk of ?ī:k khā: sip mė:t as already been proven earlier. The postadverb thâu nán, proven as the outermost layer of the QP, attaches to QP", denoting the larger phrasal expansion. It modifies the whole chunk of ?ī:k khā: sip mė:t kwā:.

A further semantic argument to support that kwā: and thâu nán are postmodifiers of the quantifier phrase is from the restriction of the question word used with these two elements in the echo question test frame. We have to use \( kī: \).
(how many) + classifier (accorded with the given noun) with postadverbs kwä: and thâunán. On the other hand, with premodifiers: Preadverb, Degree word, QW, we have to use the question word thâurai. Thâurai includes a semantic notion of general classifier.

(42)  
\[ \text{dae}:\eta \text{ mi: mít lè sɔ:m thâurai} \]
Dang have knife and fork how many

How many knives and forks does Dang have?

(43)  
*\[ \text{dae}:\eta \text{ mi: mít lè sɔ:m ki: khan} \]
Dang have knife and fork how many class.

How many knives and fork does Dang have?

In (42), mít and sɔ:m do not select the same classifier. Mít selects lem while sɔ:m selects khan. However, we can use thâurai to make a question form. In addition, the ungrammaticality of (43) helps prove that thâurai has the semantic notion of a general classifier because we cannot use ‘ki: + classifier’ the same way as thurai. Unlike thâurai, ki: must be used with a specific classifier according to its selectional restrictions.

We can now address the problem proposed at the beginning of how we know the meaning of the quantifier phrase:

(44)  
\[ \text{pha: sā:m mé:t rā:k} \]
cloth three class. the first

is ‘the first three meters of cloth’ rather than ‘the three first meters of cloth’ or ‘three meters of the first cloth.’ We have already been provided with the syntactic arguments for the different levels of attachment for the QP. A further argument in support of this is of a semantic nature.
In (45), sāːm is closely linked to its head classifier and they have already been proven to be in the same constituent. The internal hierarchical structure tells us that the constituent [sāːm [mēːt]] is embedded in the constituent [[sāːm [mēːt]] rāːk]. sāːm modifies mēːt and rāːk modifies the whole constituent of sāːm mēːt.

Thus, we obtain the first reading as the correct one.

(46) phâː mēːt nīŋ
cloth class. one

one meter of cloth

(46) is one of the few quantifier phrases that have reversed the order of cardinal and classifier. As a matter of fact, in Thai, the word order is generally fixed. Moreover, the only cardinal number that can occur in this position is nīŋ (one). There is no quantifier phrase in Thai like (47).

(47) *phâː mēːt sāːm
cloth class. three

three meters of cloth

The reversed order of classifier + cardinal can occur in more complicated QP as follows:

(48) a. phâː mēːt nīŋ
b. phâː mēːt nīŋ thâun
b. phâː khâː mēːt nīŋ
d. \textit{phâ: khâ: mé:t nîg thâunan}

e. \textit{phâ: ?î:k khâ: mé:t nîg}

f. \textit{phâ: ?î:k khâ: mé:t nîg thâunan}

\textit{nîg} is moved across the classifier but not across the postadverb \textit{thâunan} and \textit{kwâ}; and also not across the premodifiers \textit{?î:k} and \textit{khâ}:

(49) a. \textbf{*phâ: mé:t kwâ: nîg}

b. \textbf{*phâ: mé:t thâunan nîg}

c. \textbf{*phâ: nîg ?î:k mé:t}

d. \textbf{*phâ: nîg khâ: mé:t}

The evidence from (49a, b, c, d) proves that \textit{nîg} can move only within its own internal structure and this also supports the argument that each element has its own level of attachment.

(50) a.

\begin{center}
\begin{tikzpicture}
  \node (N) at (0,0) {N''}
  \node (NP) at (-2,-1) {N'}
  \node (NP1) at (-3,-2) {N}
  \node (NP2) at (-1,-2) {N}
  \node (QP) at (-1,-1) {QP'}
  \node (QP2) at (0,-1) {QP''}
  \node (Postadv) at (1,-2) {Postadv.}
  \node (QW) at (2,-2) {QW}
  \draw (NP) -- (NP1)
  \draw (NP) -- (NP2)
  \draw (NP1) -- (QP)
  \draw (QP) -- (QP2)
  \draw (QP2) -- (Postadv)
  \draw (Postadv) -- (QW)
  \node (phâ) at (-2.5,-2.5) {phâ:}
  \node (mé:t) at (-1,-2.5) {mé:t}
  \node (kwâ) at (0,-2.5) {kwâ: nîg}
\end{tikzpicture}
\end{center}

b.

\begin{center}
\begin{tikzpicture}
  \node (N) at (0,0) {N''}
  \node (NP) at (-2,-1) {N'}
  \node (NP1) at (-3,-2) {N}
  \node (NP2) at (-1,-2) {N}
  \node (QP) at (-1,-1) {QP'}
  \node (QP2) at (0,-1) {QP''}
  \node (Postadv) at (1,-2) {Postadv.}
  \node (QW) at (2,-2) {QW}
  \draw (NP) -- (NP1)
  \draw (NP) -- (NP2)
  \draw (NP1) -- (QP)
  \draw (QP) -- (QP2)
  \draw (QP2) -- (Postadv)
  \draw (Postadv) -- (QW)
  \node (phâ) at (-2.5,-2.5) {phâ:}
  \node (mé:t) at (-1,-2.5) {mé:t}
  \node (thâunan) at (0,-2.5) {thâunan nîg}
\end{tikzpicture}
\end{center}
(50 a, b, c, d) show that the movement of nirj violates the 'no crossing of branches' restriction. Thus they all are ruled out.

The transformational rule that can account for the structure of classifier + cardinal is ‘nirj Movement.’

‘nirj Movement’ (optional)

<table>
<thead>
<tr>
<th>S.D.</th>
<th>x</th>
<th>nirj</th>
<th>classifier</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

This is a local transformation, for, the movement only occurs between adjacent constituents (local node).

The movement of nirj across the classifier node gives rise to some phrasal structures that need to pass a semantic filter.

(51) *

*phâ: nîj kwa:
cloth class. one plus

a meter of cloth plus
When *nįg is moved across the classifier node and followed by the postmodifier *kwà: and *râ:k, *nįg must be deleted. But the empty element is still perceived as *nįg by the native speakers. This is because kwà: and râ:k always semantically contain the notion of 'singularity.' *nįg is a part of their meaning so their combination with *nįg will be redundant. These two words act as a semantic filter to rule out quantifier phrases like (51) and (53).

The *nįg that appears after the classifier can also be viewed as a postmodifier. (51) and (53) are ungrammatical because all three postmodifiers nįg, kwà:, râ:k can only appear in a single postmodifier position. This is a case where one lexical item can have two functions but still carries the same meaning. So both cardinal nįg and postmodifier nįg are derived from the phrase structure rule. Thus, there is no need for a transformational rule if the phrase is analyzed in this way.

There are still some quantifier phrases in which the different word orders create differences in meaning.

(55) phâ: sip mé:t kwà:
cloth ten class. plus
ten meters of cloth plus
(a little bit more than ten but not eleven)
(55) a.

\[
\begin{array}{c}
\text{phâ:} & \text{NUM} \\
\text{sip} & \text{kwâ:} \\
\text{mét} & \text{Postadv.} \\
\text{Class.} & \\
\text{N} & \text{Q P} \\
\text{N} & \text{N} \\
\end{array}
\]

(56) phâ: sip kwâ: mét
cloth ten plus class.

ten meters of cloth plus.
(upper to nineteen but not twenty)

(56) a.

\[
\begin{array}{c}
\text{phâ:} & \text{NUM} \\
\text{sip} & \text{kwâ:} \\
\text{mét} & \text{Postadv.} \\
\text{Class.} & \\
\text{N} & \text{Q P} \\
\text{N} & \text{N} \\
\end{array}
\]

(55) and (56) have different meanings as mentioned above. (55) has its meaning as such because kwâ: expresses the meaning of 'plus 1 unit.' This is why the meaning perceived by the native speaker is a bit more than the number given but not up to the following number; for instance, if the given number is '10' then '10 plus' in this situation is equal to 10 + .01-.99 but not 11. In this case, the focus is on the classifier mét. Every cardinal can occur before the classifier in this phrasal structure. On the other hand, (56) has its meaning as ten meters of cloth plus (upper to nineteen but not twenty). The important fact in this structure is that the only cardinals that can occur before the classifier are digital words as in (57).
(57)  
\[ \text{phå: } \text{sìp} \quad \text{kwå: } \text{mè:t} \]
\[ \text{cloth} \quad \text{ten} \quad \text{plus} \quad \text{class.} \]

\[ \text{ró:j} \]
\[ \text{‘hundred’} \]

\[ \text{phan} \]
\[ \text{‘thousand’} \]

\[ \text{mùn} \]
\[ \text{‘ten thousand’} \]

\[ \text{sâ:n} \]
\[ \text{‘hundred thousand’} \]

\[ \text{lå:n} \]
\[ \text{‘million’} \]

There are no phrase like (58)

(58)  
\[ \text{*phå: } \text{sâ:m} \quad \text{kwå: } \text{mè:t} \]
\[ \text{cloth} \quad \text{three} \quad \text{plus} \quad \text{class.} \]

Since not every cardinal can occur in the phrasal structure like (57), there must be a difference in meaning between (55) and (56). As a matter of fact, we can provide an explanation by using a semantic argument. (56) means ten meters of cloth plus (up to nineteen but not twenty): \(10 + 1\text{-}9.99\) but not 20 and if the number is 100, the plus number is 1\text{-}99.99 not 200 etc. In this case, the focus is on the cardinal (all the digital words). These two examples demonstrate the subtle range of meanings created by the different word orders. As far as the evidence goes, they are more or less accounted for by the constituent structures.

There are still some more interesting facts about numbers in QP. Thai uses the decimal system for numbers.

(59)  
\[ \text{sìp} = 10 \]
\[ \text{‘ten’} \]

(60)  
\[ \text{sâ:m sip} = 30: (3\times10) \]
\[ \text{‘three ten’} \]
(61) \[ \text{síp sā:m} = 13: (10+3) \]
'ten three'

(62) \[ \text{sā:m síp sā:m} = 33: [(3\times10)+3] \]
'three ten three'

(60) and (61) have structural difference between the prenumber and postnumber modifiers. 'The prenumber expresses 'multiplication,' but the postnumber modifier expresses 'addition.'

\[ \begin{array}{c}
\text{NUM}'' \\
\text{NUM'} \\
\text{Prenumber mod.} \\
\text{NUM} \\
\text{Postnumber mod.} \\
\text{sā:m} \\
\text{síp}
\end{array} \]

In (63), the number phrase has been proposed. The evidence that sā:m (postnumber modifier) attaches to the upper level node (NUM'') is that logically the operation of multiplication precedes the operation of addition. If the operations were performed in the opposite order, the result would be 39 rather than 33. The number phrase is the most internal structure within the QP. It modifies the head classifier. Clearly enough, this answers why we have a difference in meaning between sā:m síp kwāː méːt and sā:m síp méːt kwāː:

(64) \[ \text{sā:m síp kwāː méːt} \]
three ten plus class.

thirty plus (up to thirty nine but not forty)

(65) \[ \text{sā:m síp méːt kwāː} \]
three ten class. plus

thirty plus (a little bit more than thirty but not up to thirty one)
(66) and (67) are the associated phrase markers of (64) and (65) respectively. In (66), the number phrase modifies the head classifier ᵐᵉᵗ. ḵʷᵃ: becomes postnumber modifier modifying ˢᵃᵐ ˢⁱᵖ in the very internal structure of QP, but in (67) ḵʷᵃ: is postadverb (QP") modifying ˢᵃᵐ ˢⁱᵖ ᵐᵉᵗ in QP'.

(68) *ˢᵃᵐ ˢⁱᵖ ˢᵃᵐ  ḵʷᵃ: ᵐᵉᵗ

(68) is unacceptable because there is a restriction on the postnumber modifier. There is only one place in the phrase marker for the element. We have to choose between lexical items ḵʷᵃ: and the cardinal numbers.

prenumber modifier + number + postnumber modifier

\[
\begin{array}{c}
\text{sā:m} \\
\text{kwā:}
\end{array}
\]
(69)  
\[ \text{sā:m sip sā:m mé:t kwà:} \]
three ten three class. plus

thirty three meters plus

(69) is well-formed because \( \text{sā:m} \) is chosen to fill the postnumber modifier instead of occurring together with \( \text{kwà:} \) which leads to the unacceptability of (70)

(70)  
\[ *\text{sā:m sip sā:m kwà: mé:t} \]
three ten three plus class.

The phrase marker of (69) is displayed in (71).

(71)
\[
\begin{align*}
\text{QP''} & \\
\text{QP'} & \text{Postadv.} \\
\text{class'} & \text{kwà:} \\
\text{NUM''} & \text{mé:t} \\
\text{NUM'} & \text{Postnumber mod.} \\
\text{Prenumber mod.} & \text{NUM} \\
\text{sā:m} & \text{sip}
\end{align*}
\]

Now we can include the number phrase which is the very internal structure within QP and makes the most complicated QPs as follows:

(72)  
\[ \text{phā: ṭi:k khà: sā:m sip sā:m mé:t kwà: thàunán} \]
cloth again just three ten three class. plus only

just only thirty three meters of cloth plus more
(a little bit more than thirty three meters of cloth but not to thirty four meters)

(73)  
\[ \text{phā: ṭi:k khà: sā:m sip kwà: mé:t thàunán} \]
cloth again just three ten plus class. only

just only thirty meters of cloth plus more
(up to thirty nine but not forty meters of cloth)

(74) and (75) are the associated phrase markers of (72) and (73) respectively.
The other two things to observe within the quantifier phrase is how it interacts with demonstrative adjectives and prepositional phrases.
(76) phà: sà:m mét ní: thàunán
cloth three class. these only
only these three meters of cloth

(77) a. dæŋ mi: phà: sà:m mét ní: thàunán
Dang have cloth three class. these only
Dang has only these three meter of cloth.
b. dæŋ mi: phà: kì: mét nai thàunán ná (echo question)
Dang have cloth how class. which only particle
many one
Dang has how many only?
c. dæŋ mi: sà:m mét ní: e
Dang have three class. these
Dang has these three meters...

(77c) is the answer to an echo question in (77b). The deleted element perceived by the native speaker is thàunán. This proves that thàunán is the external node and there is no quantifier phrase like (78).

(78) *dæŋ mi: phà: sà:m mét thàunán ní:
Dang have cloth three class. only these

The ungrammaticality in (78) proves that demonstrative adjective is attached in the internal structure of QP. (79) is the phrase marker of (76).

(79)

```
(79)  N''
    /   \
   /     \
 N     QP''
     /     \
    /       \
QW  Postadv.  QP'
     /     \
    /       \
phà: Dem. th àunán
   /      \
  /        \
 sà:m  ní:  mét
   class.
```
(80) \( \text{phâ: sā:m mé:t kwâ: nǐ: thâu nán} \)
cloth three class.plus these only
only these three meters of cloth plus

(81) \( \text{phâ: sā:m mé:t râ:k nǐ: thâu nán} \)
cloth three class. the first these only
only these first three meters of cloth

(82) \( ^{*}\text{phâ: sā:m mé:t nỳ: thâu nán} \)
cloth three class. one this only
only this one meter of cloth

(80), (81), (82) show how \( nǐ: \) interacts with the postmodifiers kwâ: and râ:k. These two postmodifiers can occur before demonstrative nǐ: but not the postmodifier nỳ which is not surprising because ‘this one’ is quite redundant in Thai; even though, there are some languages that permit this structural configuration. kwâ: and râ:k always occur before nǐ: because we cannot have the sentences like (83) and (84).

(83) \( ^{*}\text{phâ: sā:m mé:t nỳ: kwâ: thâu nán} \)

(84) \( ^{*}\text{phâ: sā:m mé:t nỳ: râ:k thâu nán} \)
The demonstrative nì: gets attached to another level within the QP. The evidence that can support this is from (85).

(85) a. \( \text{dæ:ŋ mì: phâ: sā:m mé:t kwâ: nài thâu nán ná} \)
Dang have cloth three class. plus which only particle one (echo question)

Which three meters of cloth plus does Dang have?

b. e nì: nài
this one particle

(86) a. \( \text{dæ:ŋ mì: phâ: sā:m mé:t râ:k nài thâu nán ná} \)
Dang have cloth three class. the which only particle first one

Which first three meters of cloth does Dang have?
b. e ni: nāi
   this one particle

In (85a) and (86a), ni: is substituted by the question word nāi. In (85b) and (86b) which are the answers to (85a) and (86a) respectively, ni: can occur alone and the empty elements are perceived as sā:m mé:t kwā: and sā:m mé:t rā:k respectively. (87) and (88) represent the phrase markers of (85) and (86) respectively.

(87)

(88)

In (87) and (88), ni: comes off at upper level (another QP') from the arguments developed in (85) and (86) aforementioned.

(89) phə: sā:m mé:t thāunān kho:n phə:n ni:
cloth three class. only of class. this

only three meters of this cloth
Dang has only three meters of this cloth.

Dang has only how many?

Dang has only three meters...

(90c) is the answer to the echo question of (90b). The empty element is perceived as the prepositional phrase (PP). This reveals the evidence that PP should be detached from QP and is a different phrase-level category all by itself as displayed in (91).

In (92), PP and QP are reversed in order. This shows that the PP and QP have free relative ordering and therefore are attached at the same level of phrase structure. (93) is the diagrammatic representation of (92).
Last but not least, the postadverb *thāunān* can modify only nouns without the numeral classifier as in (94).

(94)  
\[ kā:w \quad thāunān \]

that many glasses

However, the meaning of *thāunān* is not 'only' anymore. It means 'that much' or 'that many.'

(95)  
\[ dā: n \quad mi: \quad kā:w \quad thāunān \quad mâi \quad pho: \quad ro:k \]

Dang have glass that many not enough particle

Dang has not enough glasses.

In this case, *thāunān* does not occur in the QP but it modifies the head noun all by itself and comes off N". (96) is the associated tree diagram of (94).

(96)  
\[ N'' \quad \text{Postadv.} \quad thāunān \quad kā:w \]

From the overall structures of the quantifier phrases and the arguments provided thus far, we have seen how X' Syntax deals with the data in Thai. This model remedies the deficiency of traditional and early transformational grammar as it
provides insightful analyses based on distinctions between intermediate level nodes which display internal hierarchical structure as well as a linear structure of the phrase. In addition, this leads to an account of the different meanings of the structure itself.

NOTES

1 a kind of question one utters when a previous sentence one has heard was either somewhat inaudible or unbelievable.

2 or any cardinal numbers except all the digital words: 10, 100, 1,000, 10,000, 100,000, 100,000,000

3 the question word used in an echo question when QP has demonstrative adjective as its member: き: + classifier + nail. ない means 'which one' which characterize the semantic nature of demonstrativeness.

REFERENCES

