(Im)possible Constituent Orders: Nominals, Numerals, Classifiers and Ordinal Markers

Yuta Tatsumi

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Abstract

By investigating ordinals in a wide range of languages, this paper addresses a puzzle regarding (im)possible constituent orders of nominals, numerals and ordinal markers, which is similar to Greenberg's (1972) observation about constituent orders of nominals, quantifiers and classifiers. I propose that my observation and Greenberg's (1972) observation can be captured by assuming that ordinal markers occur in the same positions as numeral classifiers.

(Im)possible constituent orders: Nominals, numerals, classifiers and ordinal markers

Yuta Tatsumi*

1 Introduction

By investigating ordinals in a wide range of languages, this paper addresses a puzzle regarding (im)possible constituent orders of nominals, numerals and ordinal markers, which is similar to Greenberg's (1972) observation about constituent orders of nominals, quantifiers and classifiers. I propose that my observation and Greenberg's (1972) observation can be captured by assuming that ordinal markers occur in the same positions as numeral classifiers.

2 Issues: (Im)possible constituent orders

2.1 (Im)possible constituent orders of nominals (N), numerals (#) and ordinal markers (Ord)

My typological observation regarding constituent orders of nominals (N), numerals (#) and ordinal markers (Ord) is summarized in Table 1, which does not include languages which have numeral classifiers. I will discuss ordinals in classifier languages in Section 5.

#-Ord-N	✓	English, Italian, Spanish, English, Italian, Spanish, Greek, Turkish, Breton, Hindi, Russian, Serbian, Lezgian, Dutch, Basque, Earstern Khanty (Uralic), Kashmiri, Welsh
N-#-Ord	✓	Kove (Austronesian), Koromfe, Kurmanji, Persian, Sumerian (Isolate), Wutun (mixed Mandarin-Bonan),
N-Ord-#	✓	Abui (Papuan), Sawu, Crow, Gkuyu, Tobelo (Papuan), Western Pantar, Sawila, Helong, Choctaw
Ord-#-N	✓	Àhàn
Ord-N-#	NA	unattested
#-N-Ord	NA	unattested

Table 1: (Im)possible constituent orders of nominals (N), numerals (#) and ordinal markers (Ord)

In my survey, I do not include ordinal circumfixes (cf. Stump 2010). Moreover, I exclude suppletive ordinals such as *first* from my observation because (i) they can be analyzed as superlative adjectives such as *last*, and (ii) we cannot see a constituent order between a numeral and an ordinal marker in suppletive forms. Note also that I count pronominal clitics and possessive markers as ordinal markers if they are used to distinguish cardinals from ordinals.[1] In what follows, I will provide some examples of the combinations in Table 1.

Many non-classifier languages make use of ordinal suffixes. For example, ordinals in Kashmiri are formed by attaching the suffix *-im* to a numeral, as in (1).

*I would like to thank Thuy Bui, Jonathan David Bobaljik, Shengyun Gu, Jayeon Park, Ian Roberts, Panat Taranat, Shuyan Wang, Ting Xu and Muyi Yang for their comments and help with collecting data. Examples not attributed to any source are from my consultants. I am also grateful to the audience at PLC43. The abbreviations are as follows: ABS = absolutive case; ACC = accusative; ALT = alternative; ASP = aspect; CLS = classifier; COS = change of state; CTP = centripetal; DEM = demonstrative; ERG = ergative case; GEN = genitive; LOC = locative; NOM = nominative; PART = particle; PAST = past tense; QUOT = quotative; real = realis; SG = singular; TOP = topic marker.

[1]There are some languages in which ordinals are expressed by using relative clauses, as will be discussed in Section 5. When an ordinal occurs in a relative clause, the head noun and the ordinal appear in a different extended nominal projection. I exclude languages where ordinals are expressed by relative clauses because the current paper focuses on constituent orders of N, # and Ord in a single extended nominal projection.

(1) *trey-im-i* *ko:r-i* *li:ch* *cith'*. [Kashmiri: #-Ord-N]
three-ORD-ERG girl-ERG wrote letter
'The third girl wrote the letter.'
(Wali and Koul 1997: 263)

The constituent order N-#-Ord is also attested in some languages. (2) is an example from Sumerian.

(2) *dumu* *min-kamma=ane* [Sumerian: N-#-Ord]
son two-ORD=his
'his second son'
(Jagersma 2010: 259)

In Sawu, ordinals are formed by attaching the prefix *ke-* to a cardinal, as shown in (3).

(3) *ta* *kako* *ke* *∅* *ne* *anan-mone* *ke-d'ue* *ne.* [Sawu: N-Ord-#]
NON.PAST go PART ABS PART child-male ORD-two DEM.1.SG
'the second male-child goes.'
(Walker 1983: 18)

In my sample languages, I found one language which exhibits Ord-#-N. (4) is an example from Àhàn, a language spoken in the Southwestern part of Nigeria.[2]

(4) *ól-íro* *ashí* [Àhàn: Ord-#-N]
ORD-eight dog
'the eighth dog'
(Ogunmodimu 2015: 69)

Crucially, the last two combinations in Table 1 are not attested in my sample. Since there are six mathematically possible combinations of three items (factorial 3 = 3 × 2 × 1 = 6), we need an explanation for the two unattested constituent orders. In section 4, I will argue that the two unattested constituent orders in Table 1 are due to syntactic constraints.

2.2 (Im)possible constituent orders of nominals (N), quantifiers (Q) and classifiers (Cls)

It is important to note that the unattested combinations in Table 1 correspond to Greenberg's (1972) unattested constituent orders of nominals (N), quantifiers (#), and classifiers (Cls).[3] Greenberg (1972) reports that only four combinations of N, #, and Cls are attested in his sample. The two unattested combinations are *#-N-Cls and *Cls-N-#. His observation is summarized in Table 2, to which I also added several languages from my sample.[4] (See also Jones 1970, Aikhenvald 2003.)

[2]Belep (Austronesian), which has a certain set of numeral classifiers, seems to show the constituent order Ord-#-N. Ordinal numerals in Belep are formed by attaching the derivational proclitic *ba=*, as shown in (i).

(i) ô ta-me-li ba-pwadu gawaar. [Belep: Ord-#-N]
REAL go.uphill-CTP-GEN ORD-two day
'The second day came.'
(McCracken 2012: 293)

[3]Greenberg's (1972) observation contains numerical interrogatives such as *how many* and indefinite quantifiers such as *many*, in addition to numerals. In this paper, I make use of # as a general term of numerals and quantifiers, for expository purposes.

[4]Bangla also allows post-nominal numeral classifier constructions (i.e. N-#-Cls). However, it seems that post-nominal numeral classifiers are derived by NP-movement (Bhattacharya 1999). Japanese also has pre-nominal and post-nominal numeral classifiers.

#-Cls-N	Frequent	Bangla, Chinese, Vietnamese, Hmong, Uzbek, Hungarian
N-#-Cls	Frequent	Burmese, Khmer, Lahu, Mal, Thai
Cls-#-N	Rare	Ibibio (Niger-Congo)
N-Cls-#	Rare	Abun (Papuan), Bodo (Sino-Tibetan)
#-N-Cls	NA	unattested
Cls-N-#	NA	unattested

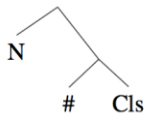
Table 2: Greenberg (1972): (Im)possible combinations of nominals, quantifiers and classifiers

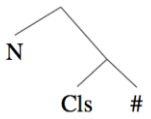
Based on the fact that ordinal markers and numeral classifiers exhibit the same pattern as shown in Table 1 and 2, this paper pursues an analysis in which ordinal markers and numeral classifiers occur in the same positions in the extended nominal projection.[5]

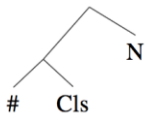
3 An analysis of Greenberg's (1972) observation: Her (2017)

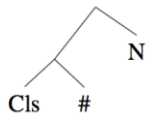
Since my observation in Table 1 is essentially similar to Greenberg's (1972) observation in Table 2. one may consider the unattested constituent orders can be analyzed in the same way. Let us consider first Her's (2017) analysis of Greenberg's (1972) observation in Table 2.

Her (2017) investigates whether the pattern in Table 2 can be captured by previous approaches to Greenberg's (1963) Universal 20. Specifically, Her (2017) argues that Abels and Neeleman's (2012) analysis can capture the the pattern in Table 2, together with one additional assumption that classifiers and numerals form a constituent, to the exclusion of the head noun. Under Her's (2017) analysis, we have four possible underlying structures, as in (6).

(6) a. 

b. 

c. 

d. 

The structures in (6) result in the attested combinations in Table 2. Moreover, the two unattested word orders (i.e. #-N-Cls and Cls-N-#) cannot be derived under Her's (2017) analysis that classifiers and numerals form a constituent, to the exclusion of the head noun.

Her's (2017) argument hinges on the assumption that classifiers and numerals form a constituent before combining with the head. However, this assumption faces a problem when we consider nominal ellipsis in Vietnamese. Nguyen (2004) reports that classifiers in Vietnamese can be elided together with the head noun, while leaving a numeral as the remnant. In (7b), the elided part is interpreted as 'three books', just like (7a).

(7) *Nguyên mua năm cuón sách và ...*
Nguyen bought five CLS book and
'Nguyen bought five books and ...'
a. *Khanh mua* [*ba cuón sách*] .
Khanh bought three CLS book
b. *Khanh mua* [*ba* Δ] .
Khanh bought three
'Khanh bought three books.'

The acceptability of (7b) is not expected if we assume that classifiers and numerals form a constituent, to the exclusion of the head noun, as schematically represented in (6). In (6), there is no constituent which can undergo ellipsis while leaving the numeral as the remnant.[6]

[5]It is worth noting that the combination Cls-#-N is observed in a few languages. My survey shows that ordinal markers are similar to numeral classifiers in this respect, too.

[6]Note that it seems difficult to analyze (7b) as an example of ellipsis with a null classifier, as in (i).

As proposed by Nguyen (2004), what we need is a structure where a classifier and the head noun form a constituent, to the exclusion of a numeral, as represented in (8).

(8) $[_{\#P}$ # $[_{ClsP}$ Cls $[_{NP}$ N]]]

In (8), the numeral projects its own projection, taking the classifier phrase (ClsP) as its complement. In this structure, the ClsP can be the target of ellipsis, yielding the elided part in (7b).

What is important is that the structure in (8) is unavailable under Her's (2017) analysis. If we adopt Her's (2017) assumption about constituency of classifiers and numerals, we face a problem regarding the nominal ellipsis in Vietnamese. On the other hand, if we allow the structure in (8), we need another explanation for Greenberg's (1972) two unattested constituent orders (i.e. *Q-N-Cls and *Cls-N-Q) in Table 2.

4 Analysis

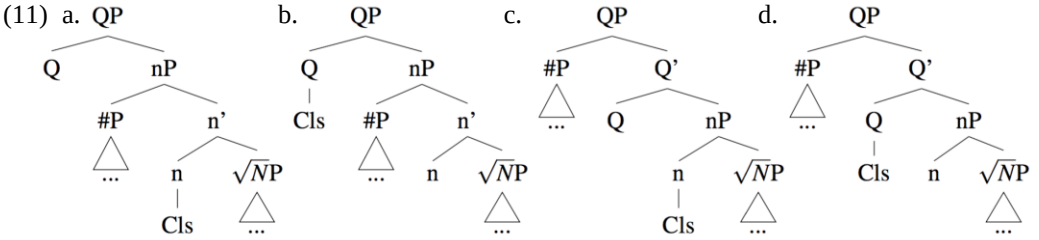
4.1 (Im)possible constituent orders of N, # and Cls

In this paper, I propose that my observation in Table 1 and Greenberg's (1972) observation in Table 2 can be captured by assuming a modified version of Sheehan et al.'s (2017) structure of the extended nominal projection. Based on a wide range of languages, they suggest that numeral classifiers can appear either in Q or in F, as shown in (10).

(10) a. $[_{DP}$ D $[_{QP}$ #P Q $[_{FP}$ (AP*) $[_{F}$ Cls] $[_{nP}$ DemP n $[_{NP}$ N (PP) (CP)]]]]]
b. $[_{DP}$ D $[_{QP}$ #P $[_{Q}$ Cls] $[_{FP}$ (AP*) F $[_{nP}$ DemP n $[_{NP}$ N (PP) (CP)]]]]]

Following Sheehan et al. (2017), I propose that numeral classifiers can occur in two different positions. I assume there are four underlying structures of numeral classifier constructions, as in (11).

(11)



(i) [[three $[_{Cls}$ ∅]] ~~$[_{NP}$ book]~~]

Some common nouns in Vietnamese can be modified by a numeral without an intervening classifier as in (iia). However, *sách* 'book' is an obligatory-classifier noun and an overt classifier is required, as in (iib).

(ii) a. *bốn* (*căn*) *phòng* b. *bốn* *(*cuón*) *sách* [Vietnamese]
four CLS room four CLS book
'four rooms' 'four books'
(Simpson and Ngo 2018: 213-214)

Moreover, the acceptability of (7b) is not related to the availability of *pro* in Vietnamese. Mandarin Chinese and Japanese, which also allow *pro*, do not have an elliptical construction like (7b). In these classifier languages, a numeral classifier is required to license the elliptical construction, as shown in (iii).

(iii) a. *Zhangsan mai-le wu ben shu. Lisi mai-le* {*san ben* Δ | **san* Δ}. [Mandarin Chinese]
Zhangsan buy-asp five cls book Lisi buy-asp three cls three
'Zhangsan bought five books. Lisi bought three books.'
b. *Yuta-wa go-satsu-no hon-o katta. Hiro-wa* {*san-satsu* Δ | **san* Δ}-o *katta*. [Japanese]
Yuta-top five-cls-gen book-acc bought Hiro-top three-cls three -acc bought
'Yuta bought five books. Hiro bought three books.'

If the elided part in (7b) contains *pro*, it is not clear why Mandarin Chinese and Japanese do not allow the same type of elliptical construction.

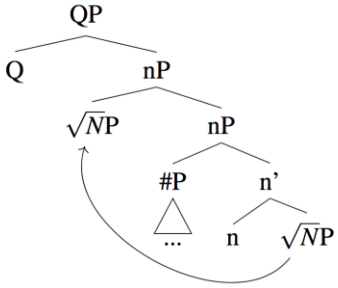
In (11a,c), the classifier head appears in n. In (11b,d), the classifier head appears in Q. The numeral phrase (#P) can also occur in two different positions; either in Spec,nP or in Spec,QP. (11a,c,d) result in the constituent order #-Cls-N, and (11b) results in Cls-#-N. √NP can also move to a higher functional head like Q in the extended nominal projection, yielding N-#-Cls and N-Cls-#.

Regarding the unattested combinations (i.e. *Cls-N-# and *#-N-Cls), I propose that they are ruled out because of the anti-locality condition, which has been independently motivated in the literature (Bobaljik and Thráinsson 1998, Abels 2003). My assumptions are summarized in (12).

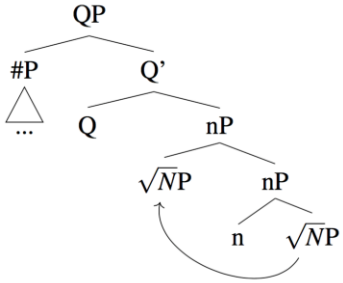
(12) a. all (relevant) movements move a subtree containing N(P);
b. all movements target a c-commanding position;
c. all movements are to the left;
d. a complement phrase cannot recombine with a projection of its selecting head.

Following Abels and Neeleman (2012), I make the assumptions in (12a-c), in addition to the anti-locality condition given in (12d). When a classifier occurs in Q, (13a) yields the combination Cls-N-#. When a classifier occurs in n, (13b) yields #-N-Cls. However, these derivations are impossible due to the anti-locality condition in (12d). Therefore, Cls-N-# and #-N-Cls are unattested.

(13) a.



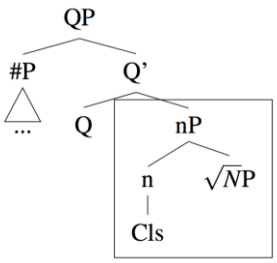
b.



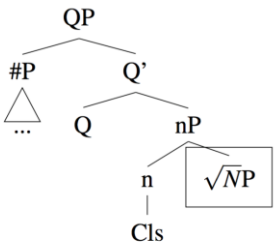
The structures in (11) thus generate all and only the attested constituent orders of N, # and Cls.

The current analysis can also capture the data about nominal ellipsis in Vietnamese, which are problematic for Her's (2017) analysis. Recall that in Vietnamese classifiers can be elided together with the head noun, while leaving a numeral as the remnant. I propose that in Vietnamese numeral classifiers are base-generated in n, and that numerals in Vietnamese appear in Spec,QP, as in (14).

(14) a.



b.



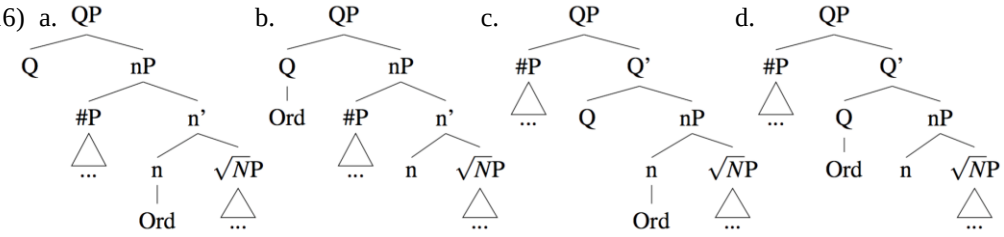
As shown in (14a), the nP containing the classifier can undergo ellipsis, yielding (7b). It should be noted that the head noun alone can be elided in Vietnamese, as shown in (15).

(15) *Nguyên mua năm cuón sách và Khanh mua* [*ba cuón* Δ]. [Vietnamese]
Nguyen bought five CLS books and Khanh bought three CLS
'Nguyen bought five books, and Khanh bought three books.'

The structure in (14) can capture the acceptability of (15). As shown in (14b), √NP can be the target of ellipsis. The proposed analysis can thus account for Greenberg's (1972) observation about (im)possible constituent orders of N, # and Cls and the data about nominal ellipsis in Vietnamese.

4.2 (Im)possible constituent orders of N, # and Ord

The fact that ordinal markers behave like classifiers regarding the (im)possible constituent orders can be accounted for by assuming that ordinal markers occur in the same positions as numeral classifiers. According to the current analysis, ordinals have the following four underlying structures.

(16) a. 

The underlying structures in (16) result in the two attested orders (i.e. #-Ord-N and Ord-#-N) in my sample languages. Moreover, when √NP move to a higher functional head in the extended nominal projection, we obtain the other two attested combinations (i.e. N-#-Ord and N-Ord-#). The anti-locality condition in (12d) rules out the unattested constituent orders (i.e. #-Ord-N and N-Ord-#). My observation in Table 2 can be accounted for under the current analysis.

5 Ordinals in classifier languages

The proposal that ordinal markers and numeral classifiers occur in the same positions (Q or n) in the extended nominal projection immediately raises a question concerning ordinals in classifier languages. In my sample, I found six combinations of N, #, Ord, and Cls, as shown in Table 3.

#-Cls-Ord-N	✓	Japanese, Korean, Chontal Maya
N-Cls-#-Ord	✓	Atong
Ord-#-Cls-N	✓	Chinese, Xong
N-Ord-#-Cls	✓	Mokilese
N-Cls-Ord-#	✓	Thai, Abun
Cls-N-Ord-#	✓	Vietnamese

Table 3: Ordinals in classifier languages

These attested constituent orders in my sample will also be captured under the current analysis.

5.1 #-Cls-Ord-N and N-Cls-#-Ord

In Japanese, Korean and the Tapotzingo dialect of Chontal Maya, ordinal markers immediately follows a classifier, yielding the constituent order #-Cls-Ord-N, as shown in (17).

(17) a. *kare-wa san-nin-me-no zyosei-o aisi-teita*. [Japanese: #-Cls-Ord-N]
he-TOP three-CLS-ORD-GEN woman-ACC love-ASP.PAST
'He loves the third woman'

b. *sumwul han pen-ccay-uy mwun-ul yele-cwu-seyyo*. [Korean: #-Cls-Ord-N]
twenty one CLS-ORD-GEN door-ACC open-please
'Please open the twenty first door.'

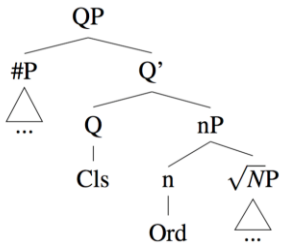
c. *ʔu čaʔ peă-ib haʔas* [Chontal Maya: #-Cls-Ord-N]
A3 two CLS.bunch-ORD banana
'the second bunch of banana'
(Knowles 1984: 282)

(18) is an example from Atong, which shows N-Cls-#-Ord.

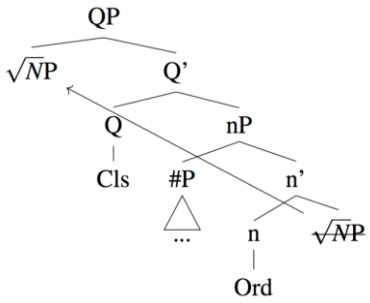
(18) *unasa boba məŋʔ sa-gaba teʔew abun boba nuk-ay-siga-ak=no*
then crazy.person CLS.human one-ORD now other crazy see-towards-ALT-COS=QUOT
'The first crazy person now saw another crazy person coming towards him, it is said'
(van Breugel 2008: 197)

These two combinations (#-Cls-Ord-N and N-Cls-#-Ord) can be derived under the current analysis, as represented in (19).

(19) a.



b.



5.2 Ord-#-Cls-N and N-Ord-#-Cls

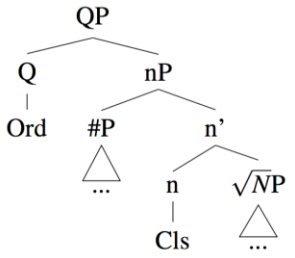
Ordinals in Mandarin Chinese and Mokilese can also be captured under the current analysis. Ordinals in Mandarin Chinese have Ord-#-Cls-N as in (20). Mokilese exhibits N-Ord-#-Cls as in (21).

(20) *qing dakai di er-shi yi-shan men.* [Mandarin Chinese: Ord-#-Cls-N]
please open ORD two-ten one-CLS door
'Please open the twenty first door.'

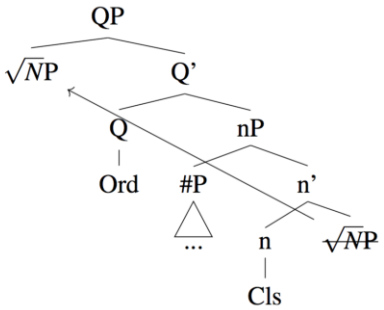
(21) *Ngoah ne wadekla puk ka-jilu-w-wo.* [Mokilese: N-Ord-#-Cls]
I ASP read book ORD-three-CLS-DEM
'I've already read the third book.'
(Harrison 1976: 102)

According to the present analysis, the ordinal in (20) has the structure in (22a). Ordinals in Mokilese can be derived from (22a) by √NP-movement to QP, as shown in (22b).

(22) a.



b.



5.3 Apparent counterexamples: N-Cls-Ord-# and Cls-N-Ord-#

Examples of ordinals in Abun and Thai are given in (23).

(23) a. *an git weu bo do-at* [Abun]
3.SG eat banana CLS DO-four
'He is eating the fourth banana.'
(Berry&Berry 1999: 93)

b. *Chan hai khaw nangsue may lem thii saam*. [Thai]
I give him book new CLS THII three
'I gave him the third new book.'

If *do* and *thii* were analyzed as ordinal markers which occur in n or Q, the data in (23) would show that these languages have N-Cls-Ord-#. This constituent order appears to be unexpected under the present analysis. However, *do* and *thii* have other grammatical functions. For example, Berry and Berry (1999) observe that *do* in Abun could be analyzed as a complementizer which stems from the verb *du* 'to speak'. The same is true for *thii* in Thai. Verbs of emotion which can take a complement clause are followed by *thii*, as shown in (24).

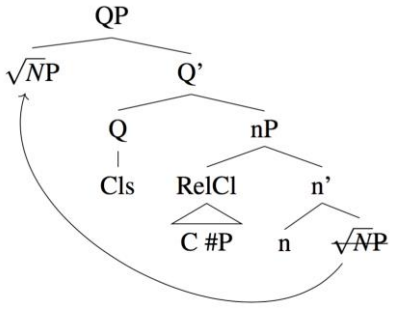
(24) *Phom sia cay thii mai day pai*. [Thai]
I lose heart THII NEG PAST go
'I am sorry that I did not go.'
(Smyth 2002: 77)

Moreover, *thii* is homonymous to a relative pronoun in Thai, as shown in (25).

(25) *Khun hen maa tua nan* [$_{RC}$ *thii kat dek*].
you see dog CLS that THII bite child
'I saw the dog that bit a boy.'
(Warotamasikkhadit 1972: 48)

Although a careful analysis of the data is required, I assume in this paper that the unexpected constituent order (i.e. N-Cls-Ord-#) is observed because ordinals appear in a relative clause headed by the complementizer in Abun and Thai. Following Sheehan et al. (2017), I assume that (reduced) relative clauses appear in the nP domain, as shown in (26). When √NP undergoes movement to QP, we obtain the apparent constituent order N-Cls-Ord-#.

(26)



Ordinals in Vietnamese can also be taken as a piece of evidence that ordinals occur in a relative clause in some languages. In Vietnamese, a classifier and a numeral are separated by the head noun and *thứ*, as shown in (27).

(27) a. *Tôi là ngứời con thứ bay trong gia đình*. [Vietnamese]
I be CLS child ORD seven in family
'I am the seventh child in the family.'
b. *Đó là căn nhà màu trăng thứ hai trên đứớng này*.
that be CLS house color white ORD two on street this
'That's the second white house on this street.'
(Nguyen 2004: 51)

(27) appears to have Cls-N-Ord-#, which is unexpected under the current analysis. However, ordinals in Vietnamese behave like relative clauses. As shown in (28), relative clauses in Vietnamese must follow adjectives in the post-nominal position. The same pattern holds for ordinals, as in (29).

(28) a. *Tôi thích cái đâm* [$_{AP}$ *mới*] [$_{RC}$ *mà cô ấy chọn*]. [Vietnamese]
I like CLS dress new that aunt that choose
'I like the new dress that she chose.'
b.**Tôi thích cái đâm* [$_{RC}$ *mà cô ấy chọn*] [$_{AP}$ *mới*].
I like CLS dress that aunt that choose new
(Nguyen 2004: 59)

(29) a. *Khanh mua cuốn sách* [$_{AP}$ *mới*] [*thứ năm*]. [Vietnamese]
Khanh bought CLS book new ORD five
'Khanh bought the fifth new book.'
b.**Khanh mua cuốn sách* [*thứ năm*] [$_{AP}$ *mới*].
Khanh bought CLS book ORD five new

On the basis of this similarity, I assume that ordinals in Vietnamese occur in the same position as relative clauses, like Abun and Thai. When an ordinal occurs in a relative clause, the head noun and the ordinal occur in a different extended nominal projection. The current paper focuses on constituent orders of N, # and Ord in a single extended nominal projection. Therefore, (27) is not counted as a counterexample of the current analysis.

6 Ordinal markers ≈ numeral classifiers

Supporting evidence that ordinal markers and classifiers are two sides of the same coin comes from the Amanuban dialect of Uab Meto (henceforth Amanuban). Amanuban is an obligatory classifier language, and numerals must appear with a classifier to modify a noun, as shown in (30).

(30) a. *atoni tuaf niim* b. **atoni niim* [Amanuban]
man CLS.person five man five
'five men' 'five men'
(Metboki and Bellamy 2014: 67)

Ordinals in Amanuban are formed by combining the ordinal marker *no* with a numeral marked with the third person prefix, as shown in (31).

(31) *uab no n-tenu* [Amanuban]
talk ORD 3.SG-three
'the third talk' or 'third subject matter'
(Metboki and Bellamy 2014: 66)

What is important is that the ordinal in (31) modifies the head noun without a classifier, despite the fact that Amanuban is an obligatory classifier language. Moreover, Metboki and Bellamy (2014) observe that the ordinal marker *no* can be interpreted as a numeral classifier for flat flexible objects, while keeping the meaning of ordinals, as shown in (32).

(32) *ben no m-bo nua'* [Amanuban]
board ORD/CLS 3.SG-ten two
the twentieth sheet of board'
(Metboki and Bellamy 2014: 66)

Given these observations, it seems reasonable to claim that *no* functions as both an ordinal marker and a numeral classifier in Amanuban. This behavior of *no* follows from the current analysis of ordinal markers and numeral classifiers.

7 Summary

The most important observation is that ordinal markers and numeral classifiers behave alike regarding the (im)possible constituent orders. By investigating a wide range of languages, I argued that my observation and Greenberg's (1972) observation can be captured by assuming that ordinal markers occur in the same positions as numeral classifiers.

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