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On the Inherent Complexity of Language: The Interaction of Numerals and Incorporation*

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Abstract

The Nuuchahnulth language of Vancouver Island is a morphologically complex language which makes extensive use of both polysynthesis and incorporation. Furthermore, it exhibits a typologically unusual number system which may best be described as split decimal/vigesimal. However, the most fascinating aspect of these properties is the complex interaction that takes place when numbers are incorporated into the verb. This paper will examine this interaction and the structures and processes that are involved in its realization. The consequences of this interaction provide us with an example of a complex linguistic system that extends to the limits our conception of language processing and learnability and the models we propose to deal with it.

* Thanks to Eun-Sook Kim and Steve Matthews for comments on earlier versions of this paper and to the anonymous reviewers for their helpful comments. Nuuchahnulth is also known in the literature as Nootka. Data for this paper are drawn mainly from the unpublished fieldnotes of Edward Sapir (Sapir Ms.) gathered in the early part of the 20th C. when the language was viable. Published versions of some of this material appear in Sapir & Swadesh (1939, 1955).

Keywords: Complex numerals, incorporation, Nuuchahnulth, coordination

The Nuuchahnulth language is spoken on the west coast of Vancouver Island in the Pacific Northwest of America. It is presently spoken by only a small number of elderly individuals, mainly over the age of seventy: in other words, it is in an extreme state of language endangerment. It exhibits a number of interesting properties in different areas of the grammar, but the phenomena to be examined here are perhaps the most complex and the most interesting. They involve the interaction between the verb and its object, in particular when that object contains a numeral. In such cases, the numeral, or in the most extreme case, a part of a complex numeral, appears combined with the verb, while the remainder of the object appears where it would normally occur in the sentence.

This kind of phenomenon challenges our understanding of how languages work and how they can be learned and compels us to accept that long-distance dependencies between elements within the sentence are a very real possibility in language and that our theories must be prepared to deal with such contingencies when they arise.

In what follows, I will first examine the basics of polysynthesis and incorporation in Nuuchahnulth, followed by a discussion of the numeral system, including the use of classifiers, and then an examination of the internal structure of the quantifier and noun phrases. I then move on to examine the focus of the paper, the incorporation of numerals into the verb and the extent to which this may apply.

1. Polysynthesis in Nuuchahnulth

Nuuchahnulth¹ words always involve a single root morpheme,

¹ For a detailed discussion of the phonetics and phonology of Nuuchahnulth, see

which acts as the core or nucleus of the word. The root may combine with reduplicative prefixes, both derivational and inflectional suffixes, and with a small number of infixes. Word-internal compounding is not permitted (but see Stonham 2004 on phrase-level compounding). The language makes extensive use of suffixation in both creating new lexemes, as well as in marking inflectional categories in the grammar and the morphological structure is best described as polysynthetic (Baker 1996, Gerdts 1988). Clitics are also found following the first element of a phrase, i.e., in second position. The basic structure of the word is as in (1).

- (1) REDUPLICATION- ROOT - DERIVATIONAL SUFFIXES -
INFLECTIONAL SUFFIXES = CLITICS

A word may consist of only the root, or may be built up in various ways. Certain suffixes require a concomitant reduplication of some part of the beginning of the root. Inflectional suffixes are most evident with verbs, which usually appear initially in the sentence. Examples of various possibilities appear in (2) below.

- (2) a. ʔuuqʌnuk^waʌatquuč²
ʔu-^waqʌ -^wnuk -^waʌ -^wat -quuč
REF -inside-in hand -NOW -SW -3.CND

Stonham (1999). For more information regarding its complex morphology, see Kim (2003), Stonham (2004).

² Data for this paper are transcribed in a modified Americanist format. Principal divergences from the IPA include: š = ʃ, č = tʃ, ʌ = tʃ. Abbreviations employed in this paper include the following: [R] reduplicated, ABS absolutive mood, CAUS causative, CLS classifier, CND conditional mood, DEF definite, DIM diminutive, DIST distributive, DUR durative aspect, FUT future tense, IND indicative mood, ITER iterative aspect, LOC locative, MOM/M momentaneous aspect, NOM nominalizer, NOW contemporaneous, P plural, POSS possessive, QUOT quotative, REL relative, S singular, SUB subordinate mood, SUF suffix-triggerred reduplication, SW switch reference.

- ‘If one is holding a stick.’
- b. hiniicsk^wispiλikqa
 hina -iics -k^wis -’ipiλ -ik -qa’
 LOC -take along -out of -in the house [M] -FUT -3.SUB
 ‘He will pull (the slave) out of the house.’
- c. p̣apaataḥ
 [R] -p̣a -ataḥ
 SUF- to potlatch -ready to, try to get [R]
 ‘ready to potlatch’
- d. ʔuʔuʔutaḥ
 [R]- [R]- ʔu -ataḥ
 DIST-SUF- REF -ready to, try to get [R]
 ‘whaling here and there’

We will now move on to examine how polysynthesis and incorporation interact in the language.

1.1 Polysynthesis and Incorporation

Incorporation of various constituents is a common concomitant of polysynthesis in the morphology of a number of languages (Gerdtz 1988). It is often combined with polysynthesis to form a single morphological type, contrasted with isolating, agglutinative and fusional, but Comrie (1989:45) is careful to distinguish the two:

Although these two terms [i.e., polysynthesis and incorporation] are sometimes used interchangeably, it is possible and advisable to make a distinction between them. Incorporation refers to the possibility of taking a number of lexical morphemes and combining them together into a single word. Polysynthesis, however, refers simply to the fact that, in a language of this type, it is possible to combine a large number of morphemes, be they lexical or grammatical, into a

single word. We thus see that incorporation is a special case of polysynthesis.

This observation would seem to suggest that where there is incorporation there will necessarily be polysynthesis and, in this respect, Nuuchahnulth bears all of the expected attributes of such a system, including the movement of (some portion of) the object into the verb. Syntactically, the language is basically verb-initial, with some variation in the order of subject and object arguments and other elements. Pronominal reference is marked on the verb by members of a number of alternative paradigms, although in some cases of the 3rd person there is no overt marking. Incorporation of an external element, typically root + derivational affixes, from the direct object into the verb is not uncommon, as shown in (3b).

- (3) a. ʔunaakʃiʔaʃ [ʔaneʔis]_{Obj}
 ʔu -naʔk^w -ʃiʃ -ʔaʃ ʔana -ʔis
 REF -have -MOM -NOW child -DIM
 ‘And then she got children.’
- b. ʔʔanak
 ʔana -naʔk^w
 child -have
 ‘He had a child.’

Mithun (1984) provides examples of Nuuchahnulth as an incorporating language, but fails to recognise the existence of a necessary *neutral base* to which suffixes may be attached, just in case there is no incorporation. Incorporation is never obligatory and appears to have a certain discourse-based force in the grammar. By ‘neutral’ I mean that such a base makes no obvious contribution, either in subcategorisation or semantics, to the final output, serving only as a referential base, substituting for an incorporated object. This would predict that this base should never occur without some

derivational suffix that acts as the predicator. Compare the examples in (4a) and (4b), where this base, *ʔu*, occurs in the first example (4a), but not in the incorporated form in (4b).

- (4) a. *ʔunaakweʔin* [^ʔ*nuwiiqsu*]_{Obj} *haak^waaʔi*
ʔu -na^{k^w}-weʔin *nuwiiqsu* *haak^waaʔ. =ʔi*
REF-have -3.QUOT father young woman =DEF
‘The girl had a father.’
- b. *nuwicnahʔapikin* *yaa* *naʔaqakʔi*
^ʔ*nuwiiqsu-na^h-ʔap -ik -in* *yaa* *naʔaqak=ʔi*
father -seek -CAUS -FUT -1P.IND there baby =DEF
‘We’ll have that baby look for his father.’

Greenlandic, which is typologically quite similar in terms of its use of polysynthesis and incorporation, exhibits a neutral base also, as noted by Fortescue (1984:83):

With *qar* [‘have’] the possibility of a corresponding non-incorporating construction exists using ‘empty’ stem *pi-* plus that affix, the ‘object’ appearing in the instrumental case externally.

He provides the following examples (*ibid*) (where *-nik* indicates the instrumental case):

- (5) a. *ikinngutiqarpuq*
‘He has a friend/friends.’
- b. *ikinngutinik piqarpuq*
‘He has some friends.’

Thus, for both Nuuchahnulth and Greenlandic, incorporation is optional syntactically, and applies only to objectys since it will always be possible to make use of the so-called referential base, *ʔu*,

in Nuuchahnulth, or *pi* in Greenlandic, with derivational suffixes, instead of incorporating an overt object. In fact, under certain conditions, such as potential extraction from a coordinate structure, incorporation is actually prohibited in Nuuchahnulth (see Stonham 2004). Investigating the exact motivation for incorporation would take us well beyond the scope of this paper and so I will restrict the investigation to the hows rather than the whys of incorporation here.

2. Numerals

The study of numerals and their place in the grammar of natural languages has long been viewed as an area of special interest for those concerned with issues of language (see, for example, Hurford 1987, 2003). The Nuuchahnulth number system is fairly complex, although relatively transparent in terms of its structural elements. Numbers from ‘one’ to ‘five’ are simplex (6a), while those from ‘six’ to ‘nine’ are composed of two elements, the roots for either ‘one’ or ‘two’ together with the suffixes *-pu* ‘more than’ and *-k^wał* ‘less than’ (6b), giving us:

(6) a.	čawaa(k)	‘one’	b.	ńupu	‘six’
	ʔaʎa	‘two’		ʔaʎpu	‘seven’
	qačca	‘three’		ʔaʎak ^w ał	‘eight’
	muu	‘four’		čawaak ^w ał	‘nine’
	suča	‘five’			

‘Ten’ and ‘twenty’ are morphologically simplex, whereas the higher multiples of ‘ten’ fall into two categories, either (i) single, morphologically-complex words or (ii) syntactic constructs, without any overlap, at least until ‘one hundred’. They are formed by the use of the suffix *-iiq* ‘...score’ in combination with the syntactic

construction *ʔiš ḥayu* ‘... and ten’.

(7) a.	<i>ḥayu</i>	‘ten’	b.	<i>qačćiiq</i>	‘sixty’
	<i>caqiiic</i>	‘twenty’		<i>qačćiiq ʔiš ḥayu</i>	‘seventy’
	<i>caqiiic ʔiš ḥayu</i>	‘thirty’		<i>muyiiq</i>	‘eighty’
	<i>ʔaʕliiq</i>	‘forty’		<i>muyiiq ʔiš ḥayu</i>	‘ninety’
	<i>ʔaʕliiq ʔiš ḥayu</i>	‘fifty’		<i>sučćiiq</i>	‘hundred’

Units between the tens are formed by the use of the conjunction *ʔiš* ‘and’ or sometimes *ʔuḥʔiš* ‘and,’ with the appropriate unit and decimal indicators, thus:

(8)	<i>ḥayu ʔiš cawaak</i>	‘eleven’
	<i>ḥayu ʔiš ʔaʕ</i>	‘twelve’
	<i>caqiiic ʔiš qačća</i>	‘twenty-three’
	<i>ʔaʕliiq ʔiš cawaak</i>	‘forty-one’

Multiples of one hundred are formed in one of two ways: (a) by continuing the use of *-iiq* ‘...score’ in conjunction with the conjunction *ʔiš* or *ʔuḥʔiš*, or (b) by the use of the appropriate unit combined with a suffix *-pit* meaning ‘...times’ followed by the form *sučćiiq* ‘hundred’. Given the consistency of the former set with the lower numbers we will assume that it is the original pattern and that the alternative system is a calque based on the English number system, i.e., ‘two hundred, three hundred,’ as shown in (9).

(9) a.	<i>ḥayuuq</i>	‘two hundred’
	<i>ḥayuuq ʔiš sučćiiq</i>	‘three hundred’
	<i>ʔaʕpituuq ḥayuuq</i>	‘four hundred’
	<i>qaccupituuq ḥayuuq kiixʔinʔath</i>	‘there were six hundred Kiihin’
b.	<i>ʔaʕpit sučćiiq</i>	‘two hundred’
	<i>qačćupit sučćiiq</i>	‘three hundred’

muupit sučiiq	‘four hundred’
nupupit sučiiq	‘six hundred’
ʔaʕak ^w aʔpit sučiiq	‘eight hundred’

Multiples of ‘one thousand’ are formed with the appropriate unit designator followed by a suffix *-pit* ‘...times’ followed by the borrowed word *taawisin* ‘thousand’, and again the structure appears to be calqued from English.

(10) nupit taawisin	‘one thousand’
ʔaʕpit taawisin	‘two thousand’
ʔaʕpit taawisin ʔiš muupit sučiiq	‘two thousand four hundred’

There is no overlap between root and suffix within the Nuuchahnulth number system, unlike in other areas of the grammar, where one may encounter morphemes with virtually identical meanings, one of which is a free verb and the other a bound verb, as in the examples in (11).

	Root	Suffix	Meaning
(11) a.	naʔuʔ	-piʔyaqʰ	‘accompany’
b.	ʕawas	-nasʔii	‘approach’
c.	maakuk	-haʔ	‘buy’
d.	siqa	-caʔqa	‘cook’
e.	qah	-sawiʕ	‘die’
f.	haʔuk	-ʔiʔs	‘eat’

As one can see from such examples, the free and bound verbs share no physical resemblance, although semantically they perform virtually the same function. In most cases the bound verbs are transitive, although not (11e), for example.

Among the numbers, all are either roots or roots combined with derivational suffixes which perform other tasks elsewhere, with the

exception of *-iiq* ‘...score’ which only occurs with the roots for the numbers from ‘two’ to ‘ten’.

2.1 Classifiers

Nuuchahnulth employs a fairly large number of bound morphemes which might best be described as *classifiers*, in the usual sense that they are based on certain characteristics of the object which they describe and to which they are syntactically bound.³ These classifiers occur in association with a root designating either a number or another quantifier, such as *ʔaya* ‘many’, *ʔanaḥ* ‘few’, etc. Examples of classifiers combined with numerals are provided in (12).

(12) ṇup-qʔiçh	‘one year’
ṇup-čiiḥ	‘one day’
ṇup-pit	‘one time’
ṇup-taqak	‘one unit’
ṇup-qimḥ	‘one chunk’
ʔaʕ-saahtakup	‘two kinds’
ṇup-taqimḥ	‘one group, tribe’
caqiic-ciḥ	‘twenty long objects’

Classifiers occur with most nouns, with a few notable exceptions. In addition to the bound classifiers presented above, it is also possible for certain free forms to behave as mensural classifiers, such as the form *tʔapqimḥ* ‘bale’ in (13g) below. This suggests that the classifier system may be somewhat open and capable of extension should the need arise.

³ For a more detailed discussion of classifiers in Nuuchahnulth, see Stonham (2004). With respect to the specific classifier assigned to each noun, see Stonham (2005)’s dictionary of Nuuchahnulth.

The distribution of classifiers with respect to complex numbers will be an important factor in the analysis of the syntax of numbers, to be discussed in the following section. Numerals may occur alone with pronominal force (13a), with a noun (13b), with a classifier with pronominal force (13c), with a classifier and noun (13d), as a complex number with noun (13e), as a complex number with classifier (13f) or with a freestanding classifier and noun (13g).

- (13) a. *wikłmiiyaqħʔaʕ* [ʔaʕeʔi]
wikłmaa -i'ya -(q)ħ-'aʕ ʔaʕa=ʔi'
 unable to -get to be at -BEING-NOW two =DEF
 'The two of them could not lift him up.'
- b. *ʔuyuʔatweʔin* *kʷatyaat* [ʔaʕa haathaakʷaʕ.]
ʔuyuʔat-weʔin *kʷatyaat* ʔaʕa PL.DUP- haakʷaaʕ.
 notice -3.QUOT Kwatyat two PL- girl
 'Kwatyat caught sight of two girls.'
- c. *ħačatakmaʔukʷiicnak* *nuuk sučapituk ʔuuš* [ħayupituk.]
ħačat-maʔ ʔukʷiic-naʔkʷ *nuuk suča-piʔʷ-uk ʔuuš hayu-piʔʷ-uk*
 all -3s.IND one's own-have song five -CLS-POSS some ten-CLS-POSS
 'Everyone has his own songs; some have five, (some) ten.'
- d. *ʔucačiʔaʕ* *mũqʷapiih ʔukteeʔi* [ʔaʕqimł čaʔak]
ʔu-ca-šiʕ-'aʕ *mũqʷapiih ʔuktaa=ʔiʔ* ʔaʕa-qimł čaʔak
 REF-go to-MOM-NOW Burned-around name =DEF two -CLS island
 'They went to the two islands named Burned-about.'
- e. *ʔuʔiisʔapsi* [ħayuuq ʔiš sučiiq ʕisaʔ.]
ʔu ʔ-iʔs -ʔap -siʔ *ħayu-iiq ʔiš suča-iiq ʕisaʔ*
 REF-consume-CAUS -1s.ABS ten-score and five-score blanket
 'I let them consume fifteen score blankets.'
- f. *ʔaħʔaaʔaʕitweʔin ʔuuʔinł* [ħayuʔiš nupuqumł čimsaʔaq.]
ʔaħʔaaʔaʕ-(m)it-weʔin ʔu-ʔinł *ħayu ʔiš nupu-qimł čimsaʔaq*
 and then -PAST-3.QUOT REF-distribute[L]ten and six -CLS bearskin
 'And then he distributed sixteen bearskins.'
- g. *ʔuukšii* ʔaʕqimł ʕahiqs [cawaak ʔapqimł.]

ʔu -š -siʔ ʔaʕa -qimʔ ʕaħiqs ʕawaʔ tʔapqimʔ
 REF -ask for -1s.ABS two -CLS box one bale
 ‘I demanded two boxes (with) each bale.’

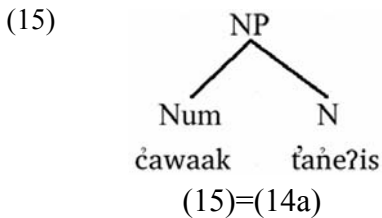
These examples will provide us with the empirical basis for describing the syntactic structure of numerals in the following section.

3. The Syntactic Structure of Numerals

In this section we will investigate the possible structures involved in phrases containing numerals. Numerals occur along with the head nouns with which they agree within the object phrase, as in forms such as those in the examples in (14).

- (14) a. ʔaanasa ʕitkkʷiscu [ʕawaak tʔaneʔis]
 only wriggle out one child -DIM
 ‘Only one child wriggled out.’
 b. ʔuyuʔaʔweʔin kʷatyaat [ʔaʕa haathaakʷaʕ]
 catch sight of Kwatyat two young women
 ‘Kwatyat caught sight of two girls.’

These examples suggest that the structure of the NP containing a numeral plus noun is something like that in (15).

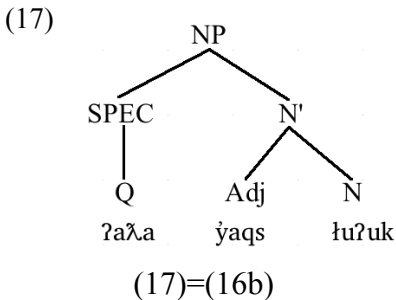


But what about the more complex cases of NPs containing modifiers

along with numerals? The examples in (16) provide instances of the kinds of combinations encountered:

- (16) a. ʔaanipsama $[\text{ʔaʔa} \text{ʔeʔinhʔis} \text{ʔiʔiʔisʔaqʔ} \quad \text{maaʔak}]$
 $\text{ʔaani -iiyʔip-sap -maʔ}$ $\text{ʔaʔa} \text{ʔeʔinhʔis} \text{ʔiʔiʔisʔaqʔ} \quad \text{maaʔak}$
 really -get -CAUS-3.IND two small white-insidegraywhale
 ‘All he got were two small white-fleshed gray whales.’
- b. ʔuhtin $[\text{ʔaʔa} \quad \text{yʔqs} \quad \text{ʔuʔuk}]$
 ʔu -htin $\text{ʔaʔa} \quad \text{yʔqs} \quad \text{ʔuʔuk}$
 REF -made of two long boards
 ‘It was made of two long boards.’

Such examples indicate that the rest of the NP follows the numeral in the unmarked case, including any modifiers. This calls for a modification to the structure in (15) above, with the numeral in a specifier position (17).⁴

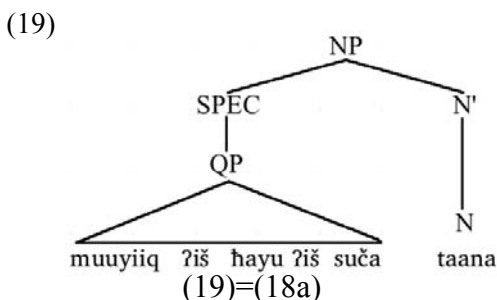


⁴ The focus here is on the conjoining of parts of numerals to form a whole number. For further discussion of the properties of noun coordination in Nuuchahnulth, see Stonham (2004). Here and elsewhere I will include only those nodes in the trees that are directly relevant to the exposition, leaving out others, such as the AP node in (17) for the sake of expository simplicity. Additionally, I project syntactic phrases such as DP, QP, CIP, etc. only when they are warranted by the presence of determiners, quantifiers, classifiers, etc. in the phrase.

Until this point, the examples we have encountered have been of simplex numbers combining with a noun and possibly a modifier, but we should now consider the consequences of complex numbers arising in this situation. Examine the data in (18).

- (18) a. [[muuyiiq ʔiš həyu ʔiš suča]_{QP} taana]_{NP}
 four-score and ten and five dollar
 ‘95 dollars’
- b. ʔuʔiisʔapsi [[həyuuq ʔiš sučiiq]_{QP} ʔisaʔ]_{NP}
 ʔu-’is-’ap-si həyu-iiq ʔiš suča-iiq ʔisaʔ
 REF-consume-CAUS-1S.ABS ten-score and five-score blanket
 ‘I let them consume 300 blankets.’

In such cases, the entire QP, containing the complex numeral, surfaces before the head noun, as in (19).



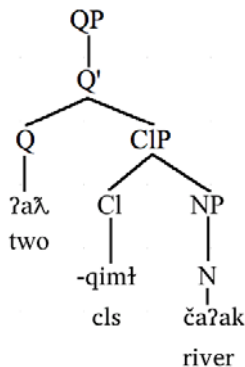
3.1 Classifier Position

The examples above should be sufficient to demonstrate the typical syntactic structure involving numerals, that is, the place of the numeral, whether simplex or complex, within the phrase. When

a classifier is also involved, its position is between numeral and noun, as exemplified in (13c) and (13d) above.

If classifiers occur between numerals and nouns, this militates for a somewhat different structure for the object phrase as a whole, one in which numerals take classifiers as complements. Numerals and classifiers are intimately bound in any language that employs them (cf. Matthews & Yip 1994 for Cantonese, Sohn 1999 for Korean, etc.) and there is no reason not to expect the same in Nuuchahnulth. The optimal means to accomplish this is by including the classifier within a unit containing the numeral. The most obvious way to do so is to propose a quantifier phrase, QP, containing a classifier phrase, CIP, as its complement. Classifiers, which delimit the class of possible nouns that may appear within their scope, would then take the noun as a complement. This structure for the quantifier phrase and its components is presented in (20).

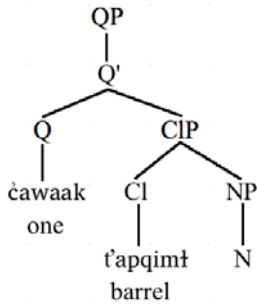
(20)



But do we really need a classifier phrase (CIP)? Because classifiers delimit the class of possible nouns as head of the NP, the classifier should have scope over the NP. The best way to achieve this is to place the NP in a complement position to the classifier (Abney 1987). In the majority of cases in Nuuchahnulth, the classifier is a

bound element and must therefore move, via some form of merger, to join with the quantifier in Q. However, in the case of certain mensural classifiers referring to containers, the form is freestanding and will not combine with the numeral but will remain in Cl, for example *t'apqim̄t* 'bale (of X)' from (14g). This would require a structure such as that in (21).

(21)



In this case there is no merger, since neither form is bound and therefore the Q and the Cl remain in their respective head positions. This empirical evidence supports the positing of a classifier phrase, CIP, between QP and NP. It further bolsters the need for the independence of CIP from QP, given the possibility of separate, freestanding classifiers such as *t'apqim̄t* 'bale'.

3.2 Coordination and its Role in the QP

Coordination is used in several ways within the Nuuchahnulth number system and it is an important element of many numerals. First, it conjoins units to tens, and scores with tens and units, as in (22).

- (22) a. hišim̄yuupaʔsi q^wamaaʔakqas ʔuwaatin caqic ʔiš hayu
 hišim̄yuup-ʔaʔ-si' q^wama-'ak -qa's ʔuwaatin caqic' ʔiš hayu
 assemble -NOW -1S.ABSThus -POSS-1S.SUB relatives twenty and ten

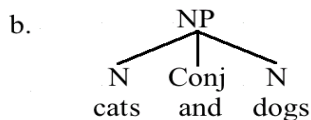
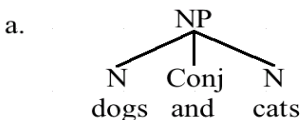
- ‘I gathered together all my relatives, 30 of them.’
 b. ʔaʔpuuq ʔiš hayu ʔiš muu ‘one hundred and fifty-four’

In addition, it can be found to conjoin coordinate NPs which contain numbers.

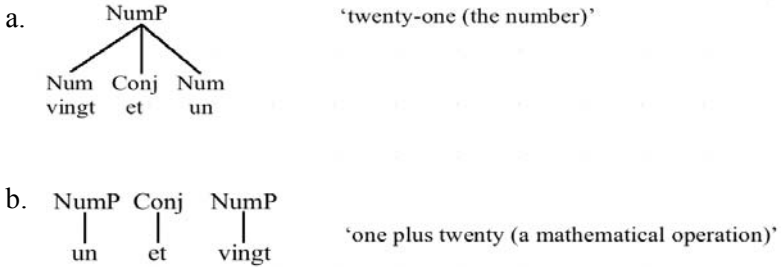
- (23) hayu ʔisaʔ mučičaʔ ʔameʔi ʔiš mucmuhaq
 hayu ʔisaʔ mučič -ʔaʔ ʔama =ʔi· ʔiš mucmuhaq
 ten blanket clothed-now house post=DEF and bearskin
 ‘The post was clothed with ten blankets and a bearskin.’

This fact suggests the need for a more articulated shape for the quantifier phrase containing a complex numeral. The idea here is that the phrase acting as numeral is basically a quantifier phrase in which the head is the numeral that *delimits* the possible range of numbers, much as we talk about units, tens, hundreds, etc., it is important to bear in mind that the use of conjunctions in complex numerals is not the same as the use of the same conjunctions within coordinate structures. Coordinate structures allow the inversion of the elements of the different branches with no direct influence on the interpretation other than a temporal effect, as shown in (24). Reversing the order of elements within a numeral, on the other hand, has serious consequences for the interpretation of the resulting form, as illustrated by the example from French in (25).

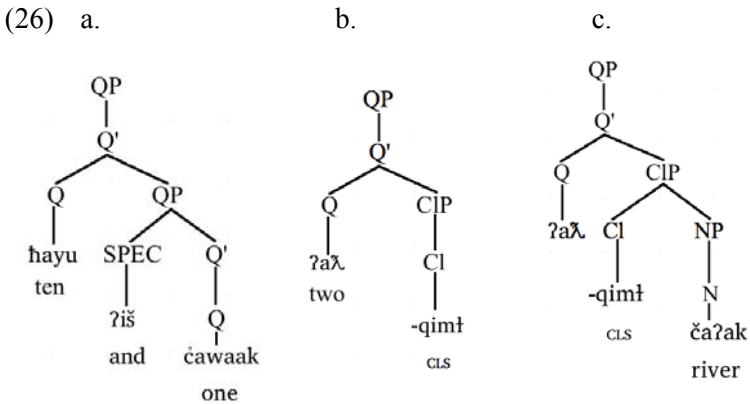
(24)



(25) French:



To summarize, the Quantifier Phrase, QP, may consist of a specifier (SPEC), a head (Q), and a complement. The complement of Q will be phrasal, either (i) another QP to allow for the construction of complex numerals, (ii) a classifier phrase to account for the presence of a classifier, or (iii) a noun phrase (NP). In the simplest case the QP may consist solely of a Q acting as a pronominal, e.g., 'two'.



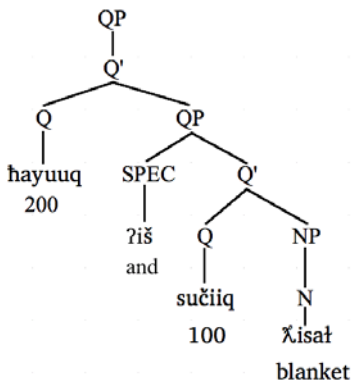
The phrase structure rules responsible for these various realizations of the QP are provided in (27).

- (27) QP → (SPEC) Q'
 Q' → Q (XP)
 CIP → (SPEC) CI'
 CI' → CI (NP)
 XP : QP | CIP | NP
 SPEC, QP : ?iš or ?uh?iš

Should the number involved be complex, then we must have some way to distinguish between the highest head and the ‘complement-head’ members of the number, so that only the highest head may be subject to incorporation, along the lines of (28). In the case of Nuuchahnulth, the largest numeric domain comes first in the majority of cases, but not always (see 9b, for example).

Compare this with examples from German, e.g., *ein und zwanzig* or French, e.g. *vingt-et-un*, both meaning ‘twenty-one’, but where the former involves a small-to-large ordering and the latter a large-to-small. Clearly both possibilities are available, and employed, typologically.

(28)



We now move on to the focal issue of this paper: how the structure of the QP interacts with the process of incorporation in Nuuchahnulth.

4. Numeral Incorporation

The numeral system as described above is already quite complex, but the fact that Nuuchahnulth allows incorporation of various elements from the object presents yet a further and more challenging level of complexity which we shall now explore.⁵ This is interesting because of the interaction of numerals with incorporation, and this will be the focus of the remainder of this paper. The crucial example is presented in (29).

- (29) hayuuʔiisuksi [e_i ʔiš sučiiq taana]
 hayu-iiq -ʔi's -uk -siʔ ʔiš suča -iiq taana
 ten -score -consume -NOM -1S.ABS and five-score dollar
 'I spent three hundred dollars on him'

Note that in this example, there is a complex numeral which is separated into two parts, one part combined with the verb, the other part remaining in its original site, preceded by the coordinator, *ʔiš*. Such examples pose an interesting problem for lexical treatments of incorporation, since the two parts of what would appear to be a single, complex numeral (=300) are located at a distance from one another. This is the usual manner in which incorporation is effected with such elements, and it is *always* the first element of the complex numeral which is incorporated.

Under these conditions, we can now explain how incorporation

⁵ For a fuller exposition of incorporation in Nuuchahnulth, see Stonham (2004). For an alternative view, cf. Waldie (2005), Stonham (Ms).

works in these cases. Firstly, it operates on the highest head of the object, whether this is an NP or a QP. If it is an NP, then the N is incorporated, as one would expect. But if the noun object is actually within a quantifier phrase, then the head of the QP, which is higher in the structure, is the target of incorporation, not the head noun.

The following examples demonstrate that this process is not strictly limited to numerals, although they pose the most interesting challenge for this process, since the parts of a number may be separated from each other, whereas for other quantifiers that are only single words, such as *?aya* ‘many,’ the entire word may move, as in (30b).

- (30) a. *hinu?atqath?at* [*?aya* *ha?um*]
 hina -(y)u?at -qath -’at *?aya* *ha?um*
 LOC -perceive -pretendedly -SW many fish
 ‘He pretends to see many fish’
- b. *?aya₁siik* [_{e₁} *ciihati*]
?aya -siik^w *ciihati*
 many -make arrow
 ‘He made a lot of arrows.’

As can be seen from these examples, the quantifier *?aya* ‘many’ can appear in a similar position to the numerals, preceding the noun, or it can be incorporated into the verb, just as the head numeral can. Also similarly, when it occurs in conjunction with a noun or noun phrase, it is always *?aya* which is incorporated, not the noun.

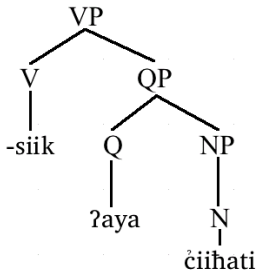
All of this suggests that, like the numbers, other quantifiers occur within a domain containing both the quantifiers and the NP, and that incorporation is sensitive to the head of the larger phrase, whether it be NP or QP, within the sentence. In the case of numerals, it would seem that the best analysis of the empirical facts is to consider the quantifier phrase to contain the noun phrase and to determine the range of possible noun complements based on the classifier

employed.

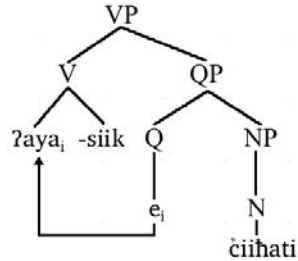
Under such an analysis, cases such as (30b) above must be derived by means of a long-distance dependency between the main verb and the direct object, along the lines of (31a) and (31b). (31a) shows the underlying structure of the main verb and its object. In (31b), the quantifier *?aya* moves via head movement and adjoins to the left of the verb, leaving the noun *çiihati* ‘arrow’ stranded in situ.

(31)

a.



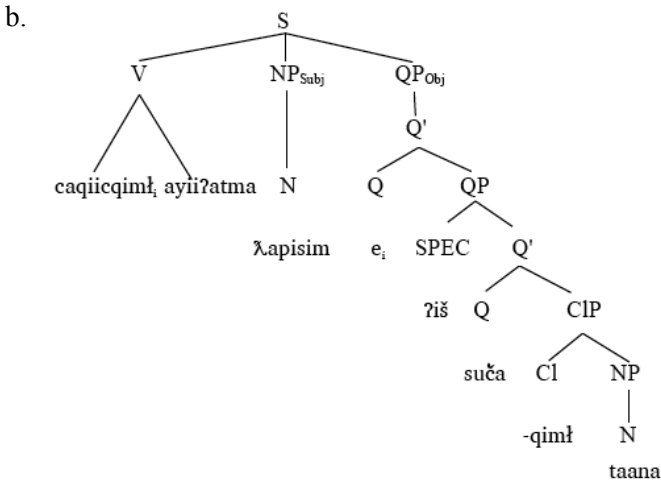
b.



(31a)=(30b)

This example demonstrates the long-distance nature of the process. Clearly, more complex examples will present even greater complexities, as shown by the case in (32). Important to note here is the fact that the movement in this example occurs *across* an intervening subject argument which interrupts the verb and its object.

- (32) a. caqiiçqimłayii?atma λapisim [e_i ?iř suçaqumł taana]
 caqiiç -qimł -ayii -?at -ma λapisim ?iř suça -qimł taana
 twenty -CLS -give -SW -3.INDRacoon and five -CLS dollar
 ‘Racoon was given twenty-five dollars.’



In this case we can see that the highest Q within the QP is merged with the main verb to give *caqiiqimlayii?atma* ‘to be given twenty.’ The rest of the QP is in its expected object position, following the subject, *λapisim* ‘Racoon.’ Examples of this type are the strongest empirical evidence for the long-distance nature of numeral incorporation in Nuuchahnulth.

5. Conclusion

In conclusion, the proposal here maintains that it is necessary to subsume the object NP within a larger QP when it is associated with any quantifier, and that in such a situation incorporation must necessarily involve syntactic movement from the position of head of QP. Furthermore, classifiers must be taken into account, as part of a classifier phrase, CIP, between the QP and the NP. This then suggests that incorporation demands a syntactic movement or its equivalent, rather than a lexical rule generating the object and its

related elements in situ. The result of numeral incorporation in Nuuchahnulth is a discontinuous element, part of which is found combined with the main verb, and the remainder of which is associated with the syntactic object of that clause.

The interaction of incorporation with the numeral system of Nuuchahnulth highlights the extent to which languages can vary and the complexities that linguists must consider in constructing theories of language. This case clearly demonstrates the limits to which learnability can extend as well.

Typologically, Nuuchahnulth stands near the extreme end of both polysynthesis and incorporation and must be considered carefully when addressing issues concerning the relationship between words and sentences. Languages such as this provide important evidence of long distance relationships among syntactic elements.

The phenomena involved here are rare in the languages of the world, and their combination even rarer, since it requires a language to have a confluence of several quite special properties: object incorporation, syntactically complex numerals, and a QP/CIP/NP alternation for syntactic phrases. It would be interesting to examine other similar cases to see if they behave in a similar fashion, should such cases be discovered.

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