

Nouns and Adjectives in Numeral NPs
Eytan Zweig - New York University
eytanz@nyu.edu

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1. Introduction

Recent work has attempted to provide a unified syntax and semantics for numerals, treating them all as nouns that modify other nouns (Ionin & Matushansky (2004)). However, Numerals don't always seem to act like nouns. This poster argues that this is because some numerals are adjectives modifying an unpronounced nominal head.

2. Background Concepts

- Simple Numeral – A numeral that is a single morphological unit; e.g. *two*.
- Multiplicative (Complex) Numeral – A numeral composed by multiplying two numerals; e.g. *two hundred*
- Additive (complex) Numeral – A numeral composed by adding two numerals; e.g. *twenty-three*.

3. Adjectival & Nominal Numerals

Numbers do not seem to belong to a single lexical category. They can show properties of nouns, adjectives, or both. In many languages, lower numeral words show properties of adjectives and higher numeral words show properties of nouns. What follows are a few examples of a pattern that repeats in many languages. (see Jespersen (1969), Corbett (1978), and Hurford (1987)).

3.1 Luganda:

In many Bantu languages, numerals lower than a certain threshold (often 5 or 10, though much variation exists) show class agreement with the noun they modify, featuring adjectival or enumerative agreement prefixes. Higher numerals do not agree, instead featuring nominal class prefixes of their own. This can be seen, for instance, in the following Luganda data:

1. emi-dumu e-biri (Luganda)
mi-jug AGR_{mi}-two
two jugs
2. emi-dumu mu-sanvu
mi-jug mu-seven
seven jugs

In multiplicative numerals, high multiplicands trigger agreement in low multipliers:

3. emi-dumu ama-kumi a-biri (Luganda)
mi-jug ma-ten AGR_{ma}-two
twenty jugs

3.2 Modern Hebrew:

In Modern Hebrew, only low numerals (1-19) show gender agreement:

- 4a. shlosha yeladim / *yeladot
three-masculine boys / *girls
three boys
- b. shloshim yeladim / yeladot
thirty boys / girls
thirty boys / girls

3.3 English:

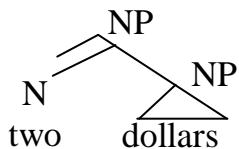
In English, starting with *hundred*, numerals can appear in plural form in partitive constructions (5), take determiners (6) and be modified by other NWs (7):

- 5 a. hundreds of boys
b. *threes of boys
- 6 a. a / several hundred boys
b. *a / *several three boys
- 7 a. four hundred boys
b. *four three boys

4.0 The Syntax of Numerals

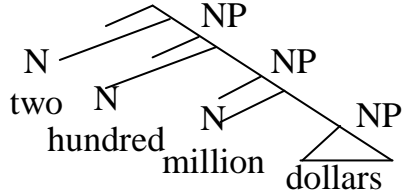
Based on Semantic and Syntactic evidence, Ionin & Matushansky argue that numerals are nouns which modify other nouns. For them, (8) has the structure in (9):

8. Two dollars
9.



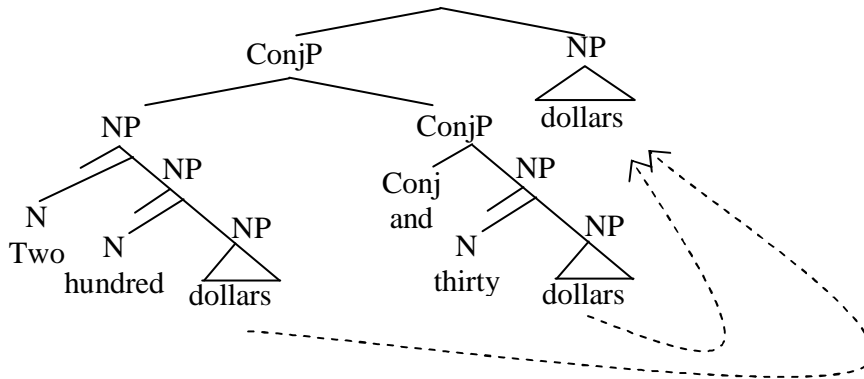
Multiplicative numerals are created recursively. The multiplier selects the NP headed by the multiplicand:

10. Two hundred million dollars
11.



Additive numerals are formed by conjunction (overt or covert) of the whole NP. The head noun then undergoes right-node raising:

- 12.



5.0 The problem and solution

By analyzing all simple numerals as nouns, Ionin & Matushansky's proposal fails to account for the adjectival properties many of them exhibit.

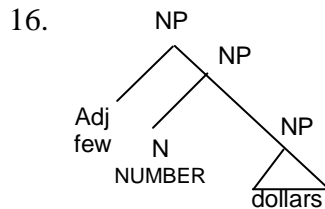
One possible suggestion is to just modify their analysis so that numerals may be either adjectives or nouns, but both function as modifiers in parallel fashions. However, this will not work. First, this solution requires a right-node raising analysis for sentences such as (13). But it is impossible to right-node raise from mixed nominal/adjectival modified NPs:

13. two hundred and three dollars
14a. Our neighborhood has both big and small houses.
b. Our neighborhood has both brick and wood houses.
c. * Our neighborhood has both big and wood houses.

Furthermore, in Modern Hebrew, adjectival numerals seem to be in the construct state with the head noun (see Zedaka (2001) for discussion). But this is a construction limited to NPs.

It seems that while low numerals have adjectival properties, they seem to have the distribution of NPs. One possible account for this is that the adjectival numerals are modifiers within an NP with an unpronounced head. Such a construction has been independently argued for in Kayne (2002, 2003). In these papers, Kayne provides many arguments for an analysis that takes *few* and *many* to be adjectives, but instead of modifying nouns directly, they modify an unpronounced noun NUMBER which heads an NP that modifies the overt noun.

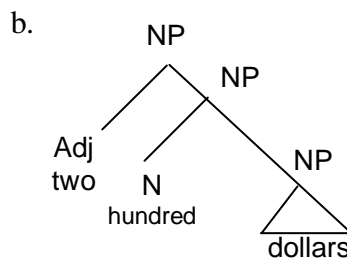
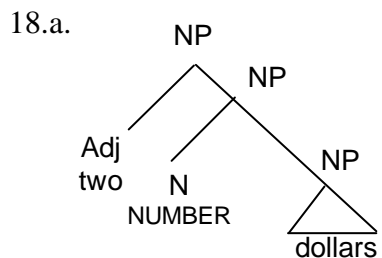
15. few dollars



In the case of numerals, therefore, I propose a parallel solution. Numeral NPs are nouns modified by adjectives¹. The noun may or may not be covert.

17a. Two dollars

b. Two hundred dollars



6. Evidence from *Every* and *Kol*

In English, *Every* can only appear with singular noun phrases. However, it can appear with plurals if the noun is modified by *few* or by a numeral:

19. *every days

20. every few days

21. every three days

22. every three hundred days

In Hebrew, when forming part of the numbers 3-900, *mea* ('hundred') appears in the plural. In these cases, it cannot normally co-occur with *kol* ('every'). *Kol* can co-occur with Singular *mea* :

¹ At this point I have no clear evidence as to whether or not there always an adjective in numeral NPs even in cases where there doesn't seem to be one ("a hundred men"). I hope to address this question in the future but nothing in this paper hinges on it.

23. shlosh meot shaot
 three hundred-pl. hour-pl.
 three hundred hours
24. ??kol shlosh meot shaot
 every three hundred-pl. hour-pl.
 every three hundred hours
25. *kol mea shaot
 every hundred-sg. hour-pl.
 every hundred hours

However, there is a class of nouns which can (optionally) appear in singular form even when modified by a nominal numeral. In this case, *kol* is possible:

26. shlosh meot ish
 three hundred-pl. Man-sg.
 three hundred men
27. kol shlosh meot ish
 every three hundred-pl. man-sg.
 every three hundred men

With adjectival numerals, however, *kol* can appear with no overt singular noun:

28. kol shalosh shaot
 every three hour-pl.
 every three hours

In other words, *kol* is good either with an overt singular noun, or with an adjectival numeral. This is consistent with there being an unpronounced noun that licenses *kol*.

7. Evidence from Luvale Additives

In the Bantu language Luvale, additives can forgo right node raising, causing the head noun to appear more than once:

29. mikoko makumi atanu na-mikoko vatanu
 sheep ten five and-sheep five
 fifty five sheep

However, nouns do not reduplicate between conjoined adjectival nominals:

30. mikoko makumi atanu na-mikoko vatanu na-umwe
 sheep ten five and-sheep five and-one
 fifty six sheep

