Reference No:

Revision History:

Name	Change Date	Version	Description of Changes
Shanza Nayyer	4th Nov, 04	0.1	Created
Zunaira Malik	13th June, 05	0.2	Change in rule
Zunaira Malik	25th July, 05	0.3	Addition of second NUMBERP rule for 'of' phrases "hundreds of people" and GEN constraint in Cardinals

Rule ID: EGR218

Rule Syntax: Following is the constituent description of the rule.
NUMBERP -> (adj) [ord | card | [ord card]].
NUMBERP -> card p.

Rule Functional Description: Following are the functional specifications of the rule.
NUMBERP -> (adj:^ADJUNCT = !;) [ord:^=!, ^NUM = SG; | card:^=!, ~[!CTYPE =c GEN]; |
[ord:^SPEC=!,!ORD_FORM =c 'first'; card:^ = !, !NUM =c PL, ~[!CTYPE =c GEN];]].

NUMBERP -> card:^=!, !CTYPE =c GEN; p:! PFORM =c 'of', ^PFORM = 'of';.

Frequency: -

Description: This rule shows the functional and constituent structure of number phrase.

c-structure: Number phrase can consist of ordinal, cardinal, or an adjective. Number phrase can also consist of an ordinal followed by a cardinal.

f-structure: In the structure of the NUMBERP (number phrase), the NUM(number) of the ordinal if it comes alone will always be singular. The number (NUM) of the cardinal when it comes alone in the NUMBERP (number phrase) will always be plural. The ord (ordinal) will become a SPEC of the mother node if it is followed by the card (cardinal). In this case, the ORD_FORM (ordinal form) in the mother node must be 'first' . an adjective can also occur before the ordinal cardinal or ordinal or cardinal. The CTYPE must be GEN only in case of "hundreds of people" where the NUM is PL for the cardinal. The constraint is put to disallow "hundred of people" or "hundreds people" to be parsed.

Example:
1) The good book's <u>first</u> page is missing.
2) This table is three times the <u>two</u> big tables' width
3) The <u>first three</u> girls are very efficient.
4) *The second one book is missing.
5) Top ten books in the list
6) <u>Hundreds</u> of people

Rule Status: Active
References:
[1] Miriam Butt, Tracy Holloway King, "A Grammar Writer's Cookbook".
[2] James Allen, "Natural Language Understanding".
[3] B.A. Hockey and Heather Mateyak, "Determining Determiner Sequencing: A syntactic Analysis for English"
Related Rules:
Related POS: EPOS112, EPOS113
Replaces: EGR133
Reason: Addition of second NUMBERP rule for 'of' phrases "hundreds of people" and GEN constraint in Cardinals
Replaced by: -

Analysis: Following is the in-depth analysis of the rule:

Analysis1:
Ordinals as in the example (1) behave just like simple attributive adjectives with regard to inflection.
Example:
1) The <u>third</u> tractor

However, in English these have a different c-structure distribution and so are assigned the syntactic category NUMBERP. They are also distinguished at f-structure in terms of the ATYPE that is assigned: ORDINAL. Cardinals, on the other hand, do not inflect, but do require the noun to be plural (unless the cardinal is *one*), and exhibit a slightly different syntactic pattern at c-structure, as show by the contrast given in the example (2).
Example:
2) a. the three brown dogs
   b. * the brown three dogs

Cardinals are thus also introduced by a special rule at c-structure (NUMBERP), and are distinguished at f-structure by being assigned ATYPE cardinal. [1, pp. 108 – 109]

Analysis2:
A simple noun phrase may have at most one determiner, one ordinal and one cardinal. It is possible to have all three, as in *the first three contestants.* [2, p. 27]

Analysis3:
McCawley gives as an argument "that numerals can be preceded by definite determiners whereas a determiner cannot in general be preceded by other determiner". However many determiners can be preceded by other determiners as in *the many problems*, so this does not seem like very strong evidence for classifying cardinal numbers as adjectives.

Result:
NUMBERP in analysis 1 is used in c-structure to differentiate in from Adjectival Phrase. In f-structure it is represented as specifier in contrast to analysis 1, in which it is added as part of adjunct. This is supported in [3]. The sequencing of ordinals cardinals is as in analysis 2.

Future Work: -