THE STRUCTURE OF RUSSIAN NUMERAL PHRASES

Rachel Wilson Sonnett*
University of Arizona

Because of the complexity of case assignment in Russian numeral phrases, their internal structure is the subject of much debate in linguistic circles. The main question concerns the status of the numeral; that is, is the numeral the head of a phrase or a modifier of some sort? Superficially, it would appear that the numeral varies in its behavior, at times acting more head-like, and at other times more modifier-like. This paper will review three proposed structures for the Russian numeral phrase, showing how each proposal is at least partially inadequate. A new, preliminary proposal will be presented at the end which appears to adequately account for the data. Finally, it will be shown that some very basic issues in Case Theory still need to be resolved, and specific deficits in this realm will be pointed out.[1]

Babby (1987), Pesetsky (1982), and Franks (1994) are all interested in the structure of Russian numeral phrases, and with good reason. Consider the strange distribution of case in the following examples:

(1)	My vypili	**pyat'**	**butylok**	**vina**
	We drank	**five (case unclear)[2]**	**bottles GEN-PL**	**wine GEN-SG[3]**

(2)	My s'eli	nash xleb i syr	s	**pyat'yu**	**butylkami**	**vina**
	We ate	our bread and cheese	with	**five INST**	**bottles INST-PL**	**wine GEN-SG**

In other words, if a noun phrase is in the nominative or accusative, the number five[4] is always followed by a noun in the genitive plural (sentence 1), an example of *heterogeneous* case marking. If the noun phrase is an oblique[5] case, however, then the number and the noun following it appear in that oblique case (sentence 2), called *homogeneous* case marking. Note that the preposition *s* ('with') assigns instrumental case.

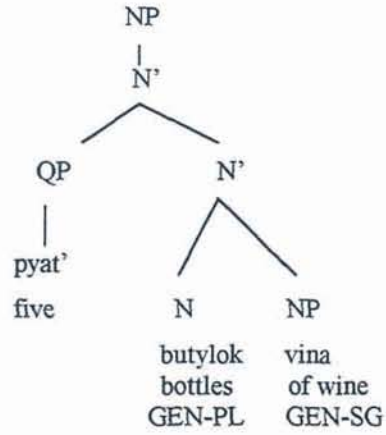
There are basically three logical variants for the possible structures of numeral phrases.[6] *Possibility I* is that sentence (1) and sentence (2) have radically different structures with the numeral as the head in sentence (1) and the noun as the head in sentence (2). Franks (1994) takes this position. *Possibility II* is that the two sentences have the same structure and the numeral is the head in both instances. This is the analysis that I will advocate at the end of the paper. *Possibility III* is that the two sentences have the same structure and the quantified noun is the head in both sentences. Babby (1987) argues for this position, and Pesetsky (1982) also argues for a version of this possibility.

Although the term 'head' is invoked in most domains of syntactic theory, few researchers agree on what a head actually is. Zwicky (1985) claims that the most salient feature of the head is that it is the 'morphosyntactic locus,' that is, it bears the inflectional markers that signify syntactic relations. Hudson[7] (1987), however, argues that "Different linguists may use the notion 'head' for different purposes -- one for percolation, another for government, and so on -- but this is to be expected in view of the multiplicity of properties

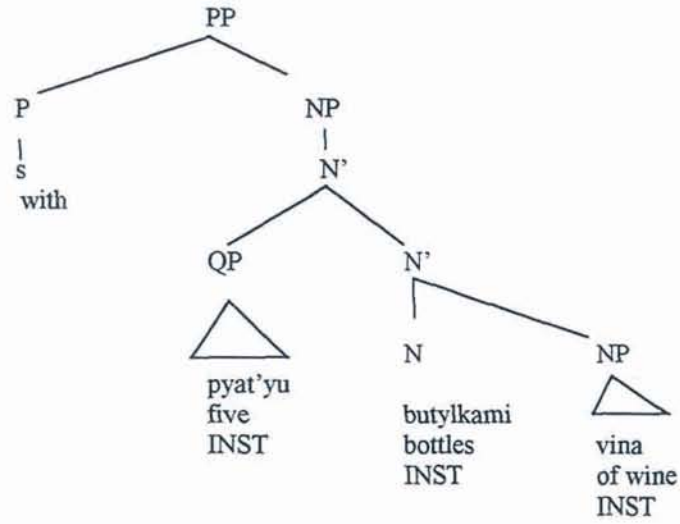
* I am indebted to Andrew Barss (Dept. of Linguistics) and John Leafgren (Dept. of Russian and Slavic Languages) for their comments and support.

that we have found for heads" (p. 35). Obviously, it is, in part, this disagreement which fuels the debate.

First I will explain Babby's approach to the problem. Babby argues for *Possibility III*, that is, that the two above phrases have the same structure, meaning that their case difference is not the result of differences in government. The structure he proposes is the following, with the quantified noun as the head of the phrase:
(Babby 1)[8]

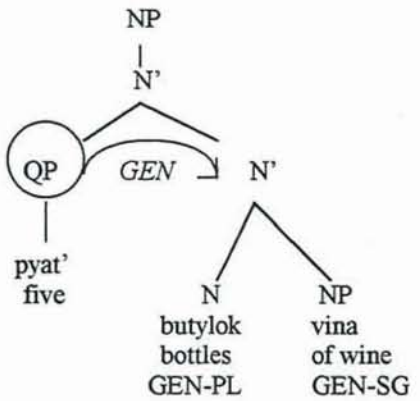


(Babby 2)

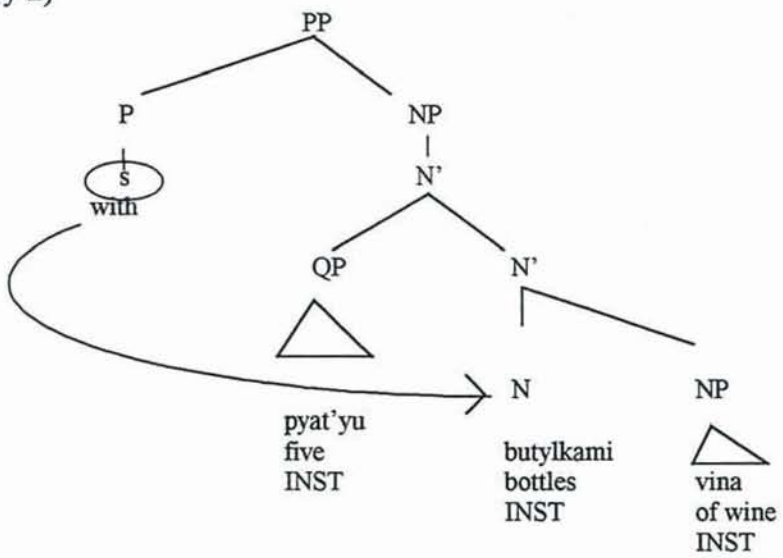


In the first sentence, the GEN-PL of the noun 'bottles' comes from the Q(uantifier)P, that is, the *maximal projection* of Q. In the second sentence, the INSTRUMENTAL case marking comes from the preposition *s* ('with'), an inherent case marker. Babby argues that the difference in case distribution is a result of two different kinds of case being assigned: *inherent* vs. *structural* (although Babby uses the terms *lexical* and *configurational*). Inherent case is assigned at D-structure, and is only assigned to arguments which the case-assigner theta-marks. Structural case, however, is assigned at S-structure and is not required to be related to theta-marking.[9] The most common instances of structural case are the cases which are assigned to subject and object. Note that in the first sentence the phrase in question is the direct object of the verb, thus it is not under the influence of any inherent case. In the second sentence the preposition *s* ('with') is an inherent case assigner which assigns

INSTRUMENTAL to its complement. In earlier articles (1985, 1986) Babby asserts that structural case is not assigned to heads, but that inherent case is. He also proposes that maximal projections can assign case. Thus, according to Babby, case assignment in the above sentences would look like the following:
(Babby 1)



In this sentence the maximal projection QP *structurally* assigns GEN-PL to the N'.
(Babby 2)

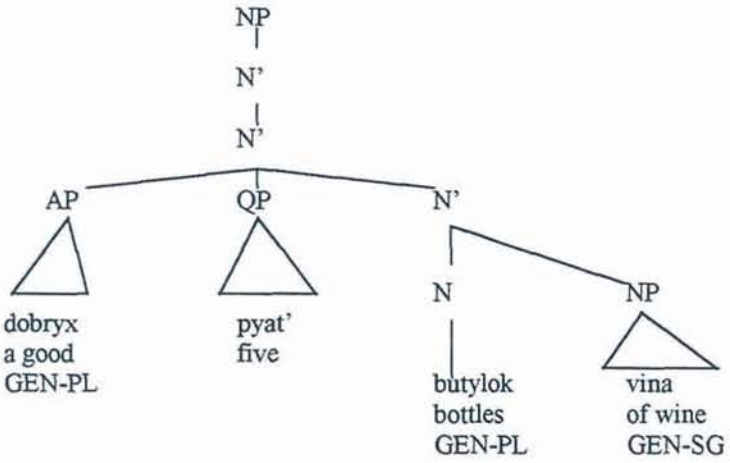


In this sentence the inherent case assigner *s* assigns INSTRUMENTAL to the head of its NP complement 'bottles.' The case then percolates up and saturates the rest of the NP, including 'five.' This goes against Standard Theory, which usually assumes case to always be assigned by heads, says Babby, citing Chomsky (1965) and Lapointe (1980). However, the result of his analysis is quite familiar to contemporary Government and Binding Theory; that is, that inherent case is stronger than structural case.[10]

So far so good. But notice also in the above trees that in order to predict the correct results, Babby has to posit a structure, a Quantifier Phrase (QP), of which the numeral is the sole constituent. There appears to be evidence for positing this structure (Babby cites Lightfoot 1979), but its position as a modifier to the noun phrase causes Babby some problems when he goes to explain sentences such as the following:

(3) On vypil **dobryx**[11] **pyat'** **butylok** **vina.**
He drank a **good-GEN-PL** **five (case unclear)** **bottles GEN-PL** **wine GEN-SG**

The tree he assumes for this is quite strange looking; notice the tree with three branches: (Babby 3)



Babby is forced into this structure by his claim that the noun and not the numeral is the head of the phrase. If he puts the modifier inside the QP, then by his explanation of case assignment, the QP can't assign it case. He cannot put it above the QP because Babby assumes that modifiers are always sisters to what they modify. Thus, it *has* to be the sister of QP, but QP already has another sister. It seems to me that this is a clue that something is wrong.

Pesetsky (1982) looks at these numeral phrases in a different way. The first thing he observed was that the heterogeneously case-marked noun phrase in (1), when used as the subject of a sentence, can have two different verbal agreement possibilities:

(4) Pyat' butylok vina **stoyalo / stoyali** na stole.
Five bottles-GEN PL wine-GEN SG **stood-*neut. sing.*/stood *pl.*** on the table.

Following an argument based on the structure of noun phrases that undergo 'genitive of negation,'[12] Pesetsky claims that because of the different possibilities of verbal agreement, the phrase 'five bottles' actually has two different structures. He calls the first variant, with a verb in the neuter singular, a QP:

(4a.) [$_{QP}$ [$_{Q}$**Pyat'**] [$_{N}$**butylok**]] stoyalo na stole.
five **bottles** stood- *neut. sing* on the table.

The second variant, with the verb in the plural, he calls an NP:

(4b) [$_{NP}$ [$_{Q}$**Pyat'**] [$_{N}$**butylok**]] stoyali na stole.
five **bottles** stood-*pl.* on the table.

In doing this he claims that NPs induce subject-verb agreement, but QPs do not, instead they use the default neuter singular ending. Note also, that he claims that sentence (2) contains an NP:

(Pesetsky 2)

My s'eli nash xleb i syr s [$_{NP}$ [$_{Q}$pyat'yu] [$_{N}$butylkami]] vina.
We ate our bread and cheese with five-INST bottles-INST wine GEN-SG.

Notice that this creates a problem. The implication is that NPs can have both heterogeneous and homogeneous case marking. Pesetsky solves this with an *ad hoc* rule that stipulates that NPs cannot have homogeneous case marking in the nominative or accusative. He admits that this is weak, but says that Russian numeral phrases are so strange, it is not surprising to find *ad hoc* rules in numeral phrases. In a footnote, he admits that he has no solution for sentence (3), the sentence which caused Babby to draw trees with three branches.

Franks (1994) draws from both Pesetsky and Babby, but for the purposes of this paper, his analysis of Babby's structural/inherent case dichotomy is more relevant.[13] Franks assumes *a priori* that sentences (1) and (2) have different structures, with the numeral in (2) as a modifier. The purpose of his article, then, is to examine the structure of sentence (1), based on additional data, such as case in other types of quantifier phrases and the case-marking of post-nominal complements. Franks shows that the case-marking of post-nominals takes place at D-Structure, even though post-nominal case marking is the result of *structural* case assignment.[14] He demonstrates this by comparing the GENITIVE induced by post-nominal structure and the GENITIVE assigned by numerals (which he calls GEN-Q), showing that the GENITIVE assigned to post-nominals overrides GEN-Q:

(5) opisanie trëx **gorodov**
description three-GEN **cities-GEN PL**
'description of three cities'

(6) *opisanie trëx **goroda**
description three-GEN **city- GEN SG**

In Russian, the so-called 'paucal numerals' (two, three, and four) assign GENITIVE SINGULAR. Since the assignment of GEN SG in (6) is ungrammatical, we can see that the post-nominal genitive is indeed overriding GEN-Q. Note that in Franks' system, both types of case assignment are structural. Franks' question, then, is: How does one structural case override another? His explanation is that despite the GB structural/inherent dichotomy, case assignment is determined independently by the features of each particular morphological case. In particular, he argues for the feature [+/- oblique], saying that [+oblique] cases are assigned at D-structure (regardless of whether or not their presence is determined structurally) and [-oblique] cases are assigned at S-structure. Thus, in Franks' model, the GEN-Q (assigned structurally by numerals) is [-oblique] and therefore assigned at S-structure. The GEN assigned as a result of sisterhood to N' (the post-nominal genitive), assigned structurally, is then [+oblique] and assigned at D-structure.[15] Next, Franks examines another kind of quantifier phrase, the *po*-phrase. *Po* in Russian is a distributional quantifier, roughly equivalent to the English 'each.' Consider the following data set:

(7) Oni poluchili po **odnomu** **rublyu.**
They received DIST **one-DAT** **ruble- DAT.**
'They received one ruble each.'

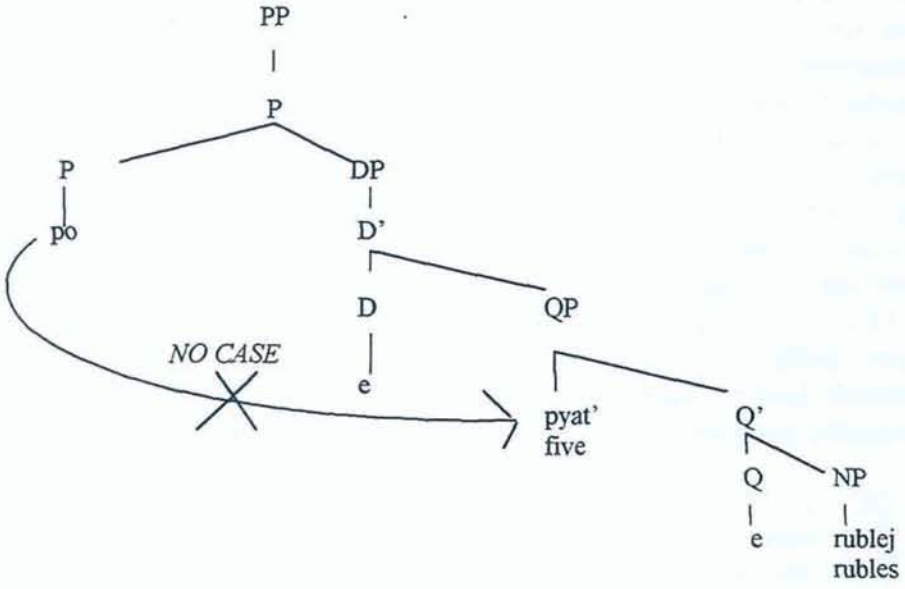
(8) Oni poluchili po **dva** **rublja.**
They received DIST **two (case unclear)** **ruble- GEN SG.**
'They received two rubles each.'

(9) Oni poluchili po **pyat'** **rublej.**
They received DIST **five (case unclear)** **rubles-GEN PL.**
'They received five rubles each.'

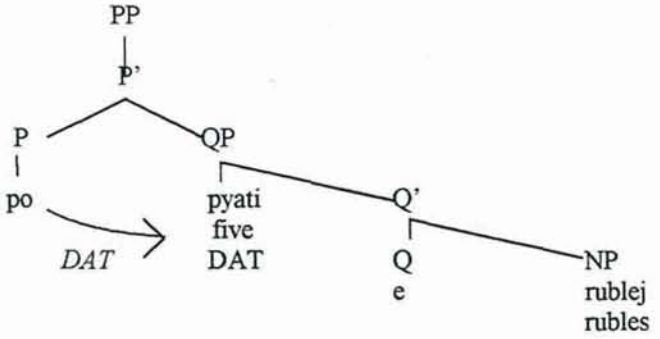
(10) Oni poluchili po **pyati** **rublej.**
They received DIST **five-DAT** **rubles-GEN PL.**
'They received five rubles each.'

It should be noted that when *po* is used as a regular preposition, without its distributional meaning, it takes a complement in the dative case. What, then, is happening in (8) and (9) and how is it that even though an apparent inherent case assigner, *po*, is present, there is still heterogeneous case marking in the quantifier phrase?

To explain this, Franks uses his system of [+/-oblique] case and a new structure of the numeral phrase, based on Abney's (1987) argument for the existence of DPs. Franks argues that *po* assigns a [-oblique] DAT at S-structure to its numeral phrase complement. Viewed this way, although *po* is an inherent case assigner, it doesn't assign its case until S-structure, just like the GEN-Q (in fact, Franks now calls this *po*-induced dative, the DAT-Q). So, in a sentence like (10), both the DAT-Q of *po* and the GEN-Q of the numeral are assigned at S-structure and the possible conflict is ironed out by minimality of government at S-structure. To deal with sentence (8) he claims that the paucal numbers two, three and four are adjectives[16] and, hence, cannot receive case straight from a case-assigner; they can only receive case via percolation.[17] This notion is a bit sketchy and will be examined in more detail below. Sentence (10) appears to be an anomaly, but Franks argues that is actually the preferred variant and that (9) stylistically belongs to a different register, which some speakers already consider to be archaic. The structure for (9) he argues is the following:
(Franks 9)



For speakers who prefer sentence (10), however, Franks assumes the following structure:
(Franks 10)



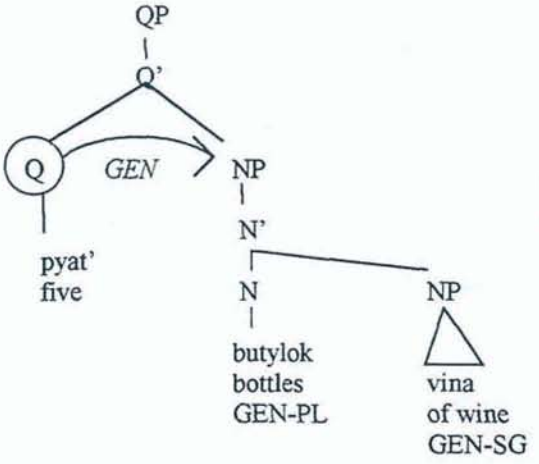
Thus the difference between sentence (9) and sentence (10) is a result of speakers' analyzing the sentence in different ways. Franks claims, as mentioned above, that sentence (10) is actually preferred and that the structure in (9) is becoming obsolete. Thus, he claims that heterogeneous Russian numeral phrases are all moving towards the QP structure as opposed to the DP structure.[18]

Note that Franks rejects Babby's data[19] for his problem sentence (3). He claims that these pre-quantifier adjectives are actually frozen forms, and that Babby's evidence to the contrary is spurious. Thus, they need not be governed at all and no explanation need be made about their apparent GEN PL case marking.

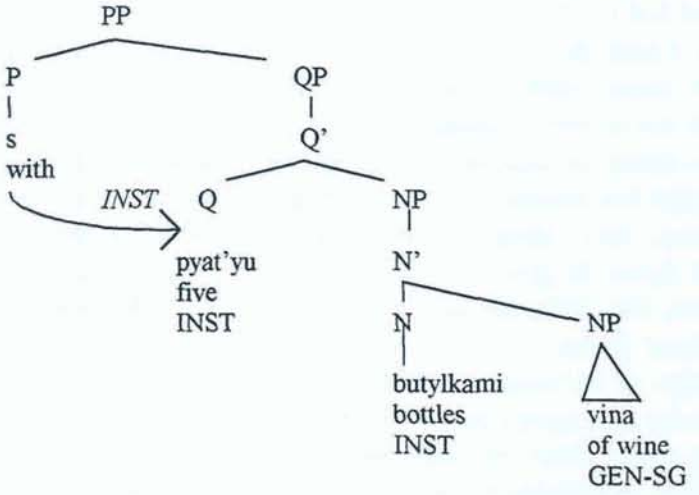
One of the points that Franks is advancing is a startling one indeed, namely, that whether case is assigned at D-Structure or S-Structure is determined solely by the features of each particular morphological case. It should be noted that to advance this claim Franks has to posit two new Russian cases, namely GEN-Q and DAT-Q, which differ from the regular GENITIVE and DATIVE in that they are assigned at S-Structure. It seems to me that this solution, while descriptively accurate, does not help in providing a theoretical framework for explaining why some cases are assigned at D-structure and others at S-structure. Also, it seems that with his *a priori* assumption that sentences (1) and (2) have different structures, he is ignoring a chunk of data that could be instrumental in resolving such a question. Also Franks' claim that the paucal numerals are adjectives undermines his analysis. If they are indeed adjectives, why, then, do they not agree in case with the nouns they modify? Obviously he is forced to give some account for the fact that the paucal numerals never occur in the dative case, but claiming that they are adjectives only complicates the problem without solving it. A final factor complicating Franks' analysis is that the existence of DPs are, at best, questionable in Russian. Russian has no articles, so the D of the DP would almost always be filled by an empty functional head.

Although a complete treatment of this problem is beyond the scope of this paper, it appears to me that *Possibility II*, mentioned at the beginning, should be reconsidered in order to account for the data. I think it would be best to return to the very basic question that underlies all of these analyses: what is 'pyat' *five*? Sometimes it appears to be the head of a phrase, because when 'five' is not in the domain of an inherent case assigner, it appears to assign case. If something can assign case, it could be a head, and, in fact, in Chomsky's Case Theory, it *must* be a head. However, when 'five' *is* in the domain of an inherent case assigner it does *not* assign case. When can a head not assign case? When it is in the domain of an inherent case assigner.

It appears, then, that Babby is at least partially right. This is a question of the resolution of case conflict, in which inherent case is stronger than structural case, not a difference in structure. But Babby proposes that the head of the phrase is the quantified noun. What if we propose that the head is the numeral? If the head is the numeral then our trees for sentences (1) and (2) would look like this:
(Author 1)

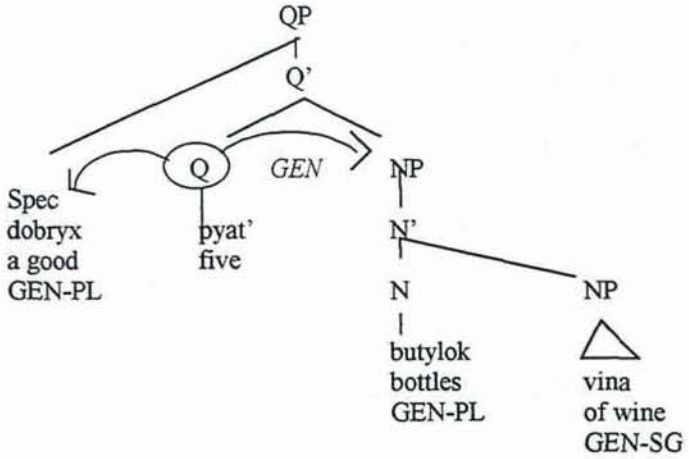


In this sentence the Q 'five' *structurally* assigns GEN-PL to the NP 'bottles.'
(Author 2)

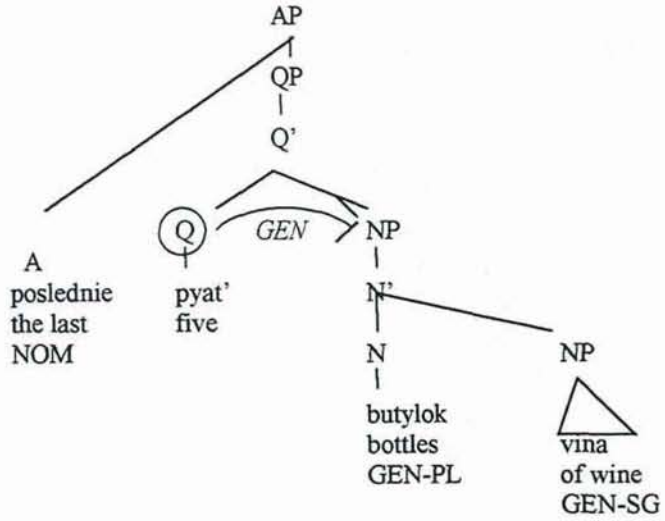


In this sentence the inherent case assigner *s* assigns INST to the Q head 'five.' The case then percolates up and saturates the rest of the QP, including 'bottles.' This structure also solves the problem of sentence (3). The tree structure allows the head 'five' to govern both the pre-quantifier adjective and the noun following the numeral:

(Author 3)



Since the pre-quantifier adjectives appear to only modify the numeral, it seems appropriate that they be placed in the specifier position. Other adjectives, which do not *exclusively* modify the numeral, would then appear outside the phrase as a separate AP:
(Author 4)



Note that this sort of analysis is analogous to Abney (1987), but does not require the positing of empty functional heads, as Franks' analysis of *po* phrases does. Additionally, this analysis is capable of handling additional *po* data that Franks did not consider. As Babby (1985, 1986) pointed out, *po* can also have a locative meaning, as in:

(11)	Oni	puteshestvovali	po	pyati	stranam.
	They	traveled	through	five-DAT	countries-DAT.

This sentence is easily handled by the tree suggested in (Author 2), with *po* as a preposition assigning case to the rest of the phrase.[20]

The next task is to tackle the problems Babby, Pesetsky and Franks raise for this structure. Babby and Pesetsky would claim that this structure is incorrect since we see a difference in verbal agreement (that is, neuter singular vs. plural). It seems to me, and to Franks, that this may be an issue of semantic vs. syntactic verbal agreement. All subjects that contain numerals (except *one*) are obviously semantically plural. Speakers who choose the plural are probably reacting to this. Speakers who prefer the neuter singular variant, on the other hand, are reacting to the fact that the numeral is itself syntactically singular. A strong piece of evidence in support of the idea of semantic agreement is the following asymmetry:

(12)	Dva	studenta	bylo/byli	na	uroke.
	Two	student-GEN-SG	was/were	in	class.

The fact that the plural variant is possible is incontrovertible evidence for the existence of semantic agreement since there simply is no plural argument in (12).[21]

Babby would also argue that if speakers are indeed reacting to the singularity of the *numeral*, then they should chose the *feminine* singular variant, rather than the neuter, since the numerals are feminine. However, I question his reasoning here. It is true that in Old Russian the numerals were syntactically and morphologically feminine, but in Modern Russian, they appear to be only *morphologically* feminine; that is, they follow a feminine declension pattern. However, syntactically, they appear to be neuter. There is never a situation in Modern Russian where a numeral takes a feminine modifier. Additionally, it should be noted that there appears to be some confusion in general about nouns of this declension type. For example, the (now) masculine noun *put'* still follows this feminine declension pattern.[22]

Franks posits the feature [+/-oblique] in order to account for the fact that post-nominal GENITIVE (assigned *structurally* in his framework) and GEN-Q (also assigned *structurally*) are assigned at different levels of representation. It seems that the whole problem here could be alleviated if we followed Chomsky's (1986) argument that the case assigned to post-nominals is *inherent*. Assuming that this is inherent case allows us to assume that it is assigned at D-structure without having to posit the [+/-oblique] feature at all.

This approach may be oversimplified, however. Chomsky claims that the case assigned to post-nominals is inherent because nouns always assign inherent case. He cites examples such as the following to support his claim:

(13) destroy the city

(14) destruction of the city

(15) the city's destruction

Notice that the verb 'destroy' in (13) has a complement 'the city,' which is assigned the theta-role *patient*. The situation is the same in (14) -- 'city' is the *patient* of 'destruction' even though 'destruction' is a noun. While this analysis extends to nouns the ability to case-mark, it places restrictions on the kind of case nouns are allowed to assign. Thus, nouns do not assign case to arguments they do not theta-mark. In this example, Chomsky's analysis certainly seems to be on track. However, the examples we have been considering thus far do not have the clear-cut theta-structure as those that Chomsky considered. What, for example,

is the situation with 'bottles of wine?' The noun 'bottles' doesn't exactly theta-mark its complement 'wine,' at least not in any traditional way. Recall that Franks' solution was to call this kind of case-assignment structural, but posit the feature [+oblique] so that it is assigned at D-Structure. This *does* describe the data, but does not provide a way of explaining it. It seems clear from this discussion that a re-working of the notions of structural and inherent case is needed to solve this problem.

There is an additional issue to be considered when discussing structural and inherent case. Chomsky proposed that both (14) and (15) above show genitive case on the complement 'city,' but in (15) the noun 'destruction' assigns genitive case to its *specifier* 'city.' This, too, causes a problem for Russian, where pre-nominal possessives are extremely restricted[23]: they can only be formed on certain nouns, and then also decline into other cases. Notice, for example:

(16)	Ya	schitayu,	chto	***Natashina***	mama	prava.
	I	consider		**Natasha's NOM**	mother NOM	to be right.

(17)	Ot	***maminyx***	zavtrakov	on	reshil	bezhat'.
	From	**mother's GEN**	breakfasts GEN	he	decided	to escape.[24]

The genitive marking in (17) is a result of the preposition *ot* ('from'), which assigns genitive case. This clearly shows that the case-marking on the possessive in either sentence is not assigned by the noun which is possessed.

In conclusion, despite the fact that three separate authors have considered the problem of Russian numeral phrases in detail, it appears that each analysis contains significant drawbacks. Since these phrases test our very basic notions of Case Theory, it seems vital to continue to examine them. However, we will never be able to reach a truly satisfactory solution until we have clarified the notions of inherent and structural case which can adequately accommodate the Russian data presented above. In particular, the marking of post- and pre-nominal genitive needs to be reviewed and clarified. While this paper was not able to provide a complete framework for debating these issues, it is hoped that by bringing them to light, it has indicated where future research is needed.

The Author

Rachel Wilson Sonnett received both her BA in linguistics and MA in Russian linguistics from the University of Arizona. Her latest research interests center on the psycholinguistics of the acquisition of Russian case endings.

Notes

1. It should be noted that the following analysis is incompatible with Chomsky's Minimalist Program (1993). As the theory stands today, MP is unable to handle the kinds of morphological complexity this paper describes. A reasonable alternative might be to follow Halle and Marantz's theory of Distributed Morphology (1993). We leave this issue for future research.
2. Declensional morphology makes it impossible to tell for sure which case this is in; it could be nominative, it could be accusative; Franks argues that it is caseless.
3. It is an uncontroversial point that the GEN-SG marking on this constituent is a result of its post-nominal status, much like the 'student of linguistics' example in English.

4. That is, numbers five and higher, except for numbers ending in one, two, three or four (excluding eleven, twelve, thirteen and fourteen).
5. Traditionally Slavists use the term 'oblique' to refer to any case other than the nominative or accusative. We will see that some researchers propose a revision to this assumption.
6. This description of the three logical variants is laid out in Babby (1987).
7. The Zwicky-Hudson debate is laid out nicely in Corbett, Fraser and McGlashan (1993).
8. Since we are dealing with the same data set for all the authors, I will use the author's last name to identify their trees.
9. Chomsky, 1986.
10. See, for example, Babby 1986.
11. This sentence has the same idiomatic meaning that it does in English. However, only a few adjectives (e.g., *dobryj* 'good,' *tselyj* 'whole,' and *polnyj* 'full') can appear in the genitive plural in this position. These adjectives appear to only modify the numeral. Other adjectives (i.e., those that modify the entire phrase) appear in the NOMINATIVE, such as:
    posledne pyat' let
    the last-NOM five years
    This will be discussed in more detail in the last section of the paper.
12. 'Genitive of negation' refers to the fact that certain types of NPs appear in the genitive case when they are under the scope of negation.
13. Franks includes a new analysis of Pesetsky's notion that QPs originate in the VP by introducing data from Koopman and Sportiche (1991) on the issue of VP-internal subjects. While interesting, the argument serves mainly to advance Franks' analysis of Serbo-Croatian and is not directly relevant to this paper.
14. His argument that post-nominal case-marking is structural is from Franks (1985) and Fowler (1987).
15. Case assignment based on the individual features of a particular case is common among Slavists, beginning with Jakobson (1936/1971).
16. This is a fairly common opinion, voiced primarily in Corbett (1983).
17. This is argued more extensively in Franks and Hornstein (1992).
18. Franks also makes an interesting point about Serbo-Croatian numerals, saying that they must always be DPs, and that this difference is a result of parametric variation.
19. He does propose a structure to handle these sentences, but questions its validity since it will not be able to account for his own Serbo-Croatian data.
20. It should be noted that this analysis is not able to handle the lack of dative case-marking on the numerals in sentences (8) and (9). We leave this issue for future research.
21. Barss (personal communication) notes that this phenomenon also occurs in English. Take for example the following sentences:
    (a) There is/are a man and a woman outside.
    (b) They wonder what each other is/are doing.
    In these instances, either singular or plural agreement is acceptable.
22. Except for the instrumental singular, *putyom*. Additionally, there are other morphologically feminine nouns that are syntactically masculine, e.g., *papa* 'dad,' but they are not of the same declension pattern as the numerals we are discussing. In general, though, it should be noted that many nouns behave differently morphologically than they do syntactically.
23. According to Townsend (1975), pre-nominal possessives are built only from certain nouns which end in *-a*, that is, only words denoting kinship relations and diminutives of Christian names.
24. These examples are from Wade (1992).

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