From the General to the Exceptional

A Network Morphology Account of Russian Nominal Inflection

by
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Abstract

This thesis analyses the nominal morphology of Russian within the Network Morphology framework. We show that a structuring imposed on grammatical categories can predict what can be shared between different types of nominal (nouns, adjectives, pronouns). Two different theories embedded within the framework are compared and an account of the marginal Russian second locative case is given.

Chapter one argues for the lexeme as a starting point for modelling morphology. The basic concepts of the framework are introduced in chapter two. Chapter three explains how they can be represented using the lexical knowledge representation language DATR, which makes it possible to discuss in chapter four principles of the framework.

Part two compares two theories of nominal morphology. Comparison of the two theories demonstrates that the choices we make regarding what is a default for adjectives determine how noun classes are structured in relation to each other. We give a number of reasons why the second theory in chapter six is to be preferred.

In part three the second locative case is incorporated into the second theory. Chapter seven outlines the generalisations connected with this case. Chapter eight shows how the second locative cannot be a default at the noun level and gives an account of why it cannot occur on adjectives.

The theories have been tested computationally using DATR on 1500 noun lexemes on the basis of frequency, which means that we can claim that they are at least descriptively adequate for a significant fragment of the nominal system.
Declaration

The work presented in this thesis has been carried out as a part-time PhD student during my period as Research Fellow on two research projects funded by the Economic and Social Research Council: project R000233633 'A DATR Theory of Russian Morphology' (September 1992-1995) and project R000236063 'The Theory of Network Morphology' (September 1995-). During this period I have worked with a number of people, but in particular with Greville Corbett, Norman Fraser and Andrew Hippisley. The DATR fragments in appendices IV, VI and XI bear the names of these researchers. This is because these fragments are partly natural developments of the work on Russian initially carried out by Greville Corbett and Norman Fraser and later modified by myself and Andrew Hippisley.

The main body of the thesis is, of course, my own original work. I am responsible for the elaboration of the principles underlying the representation and the main part of the reasoning behind it. The nominal fragments of Russian morphology are developments of the file rusnoms.dtr deposited on the Sussex DATR archive. My own contribution to this particular fragment was substantial. It involved the following: modification of Fraser and Corbett's (1995) theory in which the class V of Russian nouns is eliminated and replaced by a rule which defaults to the MOR_WORD node for uninflected nouns; the articulation of the adjectival portion of the hierarchy and the development of a first account for the classes A_I, A_II and A_III taken together; the development of a PRONOUN node and a lexicon for pronouns to fit into the theory as a whole; the addition of the nominal stress hierarchy to provide information about the stress of nouns and adjectives; 'filter' nodes for pluralia and singulabilia tantum blocking; suffix nodes to account for differences in singular and plural stems, as well as the marginal class of nouns such as im'a 'name'; treatment of fleeting vowels. Together with Andrew Hippisley (see Brown and Hippisley 1994) a more sophisticated account of the plural genitive and plural nominative of nouns was developed in fragments which preceded rusnoms.dtr. I was responsible for incorporating the basic insights of those earlier accounts into the fragment rusnoms.dtr. A number of the details of implementation of Brown and Hippisley's (1994) account of the plural genitive were different in rusnoms.dtr, although the spirit remained.

I went on to develop rusnoms.dtr further, leading to the fragments rusnoms6.dtr, rusnoms7.dtr and rusnoms8.dtr. In particular, the fragment rusnoms6.dtr represents theory A of chapter five. With its elimination of the N_O node and treatment of particular facts as nominal defaults it differs substantially from the other Network
Morphology theories of Russian that exist. In addition to my own, it still bears the names of Greville Corbett, Norman Fraser and Andrew Hippisley, because it involves the rearrangement of some code for which they are responsible, even though none of them have proposed or written DATR fragments of such a theory. Another contribution which I made in these later theories of Russian (rusnoms6.dtr, rusnoms7.dtr and rusnoms8.dtr) was to change the ordering of number relative to case from that in rusnoms.dtr. The reasons for this are given in chapter two, and are in particular based on arguments surrounding the second locative and second genitive. In the theory which deals with the second locative I introduced a node to evaluate whether a noun may have a second locative realisation and to state that this form is the same as the singular dative under stress. In all three of the theories in the appendices my treatment of the animacy-based syncretism in the singular and plural accusative differs from that of earlier work by Greville Corbett and Norman Fraser.

This work has benefited from the existence of the noun lexicon of 1500 most frequent nouns from Zasorina (1977) which Andrew Hippisley and I developed to go with the rusnoms.dtr lexicon. The lexicon for rusnoms6.dtr and rusnoms7.dtr is essentially the same with minor changes for errors in the original lexicon, or where my changing of the order of number and case attributes had an effect. The lexicon for rusnoms8.dtr involved changes to include information about semantics and syllabicity.

In recognition that the claims I make in this declaration are true, it is signed by the three researchers whose names appear in the fragments in appendices IV, VI and XI.

Greville G. Corbett
Norman M. Fraser
Andrew Hippisley

Date 26/03/98
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Acknowledgements

Many people are to be thanked for helping me in one way or another. I cannot name all who have talked about linguistic issues or given me encouragement during the writing of this thesis, but I would like to thank them. I first came to Surrey to work as a researcher on the project 'A DATR Theory of Russian Morphology' (ESRC project R000233633) led by my supervisor Professor Greville Corbett, and after its successful completion started another 'The Theory of Network Morphology' (ESRC project R000236063). Professor Corbett is to be thanked for a number of reasons. I have been given the opportunity to work in an area that interests and excites me. More than this, from him I have learnt how to do independent research and to think rigorously about language. It is especially for this that I would like to thank him. During the early part of the first project I had the benefit of discussing Russian phonology with Professor Alan Timberlake, and this informed the transcription system that is used in this thesis (appendix I). I would like to express my gratitude to Dr Lynne Cahill, Dr Roger Evans, Professor Gerald Gazdar and Christof Rumpf for helpful discussions about DATR. I am also indebted to my colleague and friend Dr Andrew Hippisley with whom I have spent over five years in the same office. As good luck would have it, he has many of the attributes and skills that I lack, and I would like to believe that proximity to him has allowed me to acquire them in some small measure. I am grateful for his critical comments on earlier drafts. My knowledge of morphology and the theoretical issues surrounding it has benefited from attendance at two different ESRC funded seminar series: 'Frontiers of Research in Morphology' and 'Challenges in Inflectional Description'. A number of participants at these seminar series are experts in their field, and I am extremely lucky to have been able to talk and exchange ideas with them. In addition to participants at the seminar series, Dr Tore Nesset is to be thanked for reading drafts of chapters seven and eight and for discussions that we have had on several topics concerning Russian, in particular the second locative. The British Council and Research Council of Norway generously provided part funding for our collaborative visits between Guildford and Tromsø, and this help is gratefully acknowledged. I thank Tanja Nesset and Dr Irina Tverdokhlebova for giving me feedback on informant questionnaires, and Dr Paul Marriott for his help with standard error. It is a great privilege to have been able to discuss my work with Dr Norman Fraser (internal examiner) and Dr Andrew Spencer (external examiner). The biggest thanks of all go to my wife Shirley who has helped and supported me steadfastly throughout, as well as reading through one of the final drafts.
Abbreviations

*Abbreviations used in morphological glosses*

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>3RD</td>
<td>Third person</td>
</tr>
<tr>
<td>ACC</td>
<td>Accusative</td>
</tr>
<tr>
<td>DEM</td>
<td>Demonstrative</td>
</tr>
<tr>
<td>EMPH</td>
<td>Emphatic</td>
</tr>
<tr>
<td>FEM</td>
<td>Feminine</td>
</tr>
<tr>
<td>GEN</td>
<td>Genitive</td>
</tr>
<tr>
<td>GEN2</td>
<td>Second genitive form</td>
</tr>
<tr>
<td>IMPER</td>
<td>Imperative</td>
</tr>
<tr>
<td>IMPF</td>
<td>Imperfective</td>
</tr>
<tr>
<td>INF</td>
<td>Infinitive</td>
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<tr>
<td>INST</td>
<td>Instrumental</td>
</tr>
<tr>
<td>LOC</td>
<td>(Combined with PREP in chapter eight to gloss the second locative)</td>
</tr>
<tr>
<td>LOC2</td>
<td>Second locative form</td>
</tr>
<tr>
<td>MASC</td>
<td>Masculine</td>
</tr>
<tr>
<td>N</td>
<td>Noun</td>
</tr>
<tr>
<td>NOM</td>
<td>Nominative</td>
</tr>
<tr>
<td>OBJ</td>
<td>Object</td>
</tr>
<tr>
<td>PART</td>
<td>Particle</td>
</tr>
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<td>Perfective</td>
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<td>Possessive</td>
</tr>
<tr>
<td>PREF</td>
<td>Prefix</td>
</tr>
<tr>
<td>PREP</td>
<td>Prepositional (also known as the standard locative case)</td>
</tr>
<tr>
<td>REFL</td>
<td>Reflexive</td>
</tr>
<tr>
<td>SG</td>
<td>Singular</td>
</tr>
<tr>
<td>V</td>
<td>Verb</td>
</tr>
</tbody>
</table>
Abbreviations in DATR representations

These are normally the lower case equivalent of the morphological glosses. We give abbreviations which do not occur in morphological glosses, or which differ from the morphological gloss in upper case.

1st First Person
2nd Second Person
cat Category
dat Dative
mor The morphological level
neut Neuter
part Participle
pres Present
sem The semantic level
syn The syntactic level

Abbreviations of Network Morphology Principles

GV Generalisation Violation
MINRP Multiple Intra-hierarchy Network Relations Prohibition
OAP Overextended Ancestor Prohibition
PIA Paradigmatic Information Addition

Other Abbreviations

TS Transitive Softening
UR Underlying Representation
Note on formatting

The use of italics
Some terms in this thesis which have a particular meaning within the Network Morphology framework have been set in italics. A second use of italics is for word forms which occur in the main body of the text.

The use of upper case
Following the DATR convention node names are written in upper case. A Network Morphology convention further makes a distinction between nodes as lexical entries, which have only an initial capital, and nodes which are not lexical entries, which have capitals throughout.

Where it has been necessary to emphasise that a particular item is a lexeme (as opposed to a grammatical word) independent of its representation in DATR we have used upper case throughout (particularly in chapters two and seven), as is the convention (Matthews 1991: 26). It should be noted that the DATR representation treats the lexemes which are lexical entries differently in that they start with an initial capital only. Elsewhere, where it has not been necessary to emphasise that certain items are lexemes we have used italics.

The use of courier
The courier font is used for DATR representations.
PART I

THEORETICAL UNDERPINNINGS
CHAPTER ONE

Introduction

1.0 Introduction

The aim of this thesis is to look in depth at the nominal morphology of one language, namely Russian, and to show how particular principles which govern the interaction of features and the form of an inheritance network play a role in determining what constitutes the 'core' of this part of its inflectional system. Many theoretical frameworks make appeal to the notion of a core system in a language, but they do not try to explain or seek to show how one determines what constitutes this core. Trying to define what are the most generally applicable parts of the system is of benefit to morphological typology for a number of reasons. Without a characterisation of why certain parts of the system are more central than others, one can fall into the trap of taking isolated phenomena from a particular language and dealing with them as though they are central. Yet dealing with isolated phenomena without putting them in their place does not allow us to make more general comparisons across languages. In fact, more exceptional items often pose problems for linguistic typology, and if we have some understanding of why they are exceptional we may come to understand where they fit when comparing a number of languages. Although our study is limited to a detailed analysis of one language, it has more wide-ranging implications for linguistic typology. We consider a detailed analysis of one language to be more important than just taking isolated instances of parts of a language and comparing them with other languages without knowing where they fit.

Complementary to this specific aim, we show how particular typological generalisations determine the place of morphology within one language. Hence the title of this thesis 'From the General to the Exceptional.' In order to carry out these two specific aims a reasonably rigorous and explicit means of expressing our ideas is required. This will demonstrate that the ideas outlined here are at least descriptively adequate, and it should also enable us to make particular claims about morphology that would not be possible if we did not use a formalism. However, it is not the aim of this thesis to develop a new formalism, but rather to apply a formalism already available for this purpose.

We know of interesting approaches to Russian morphology from an engineering perspective, such as those of Anciaux (1991) and Mikheev and Liubushkina (1995), but our use of computational representation of our theories has
theory (linguistic typology) as its primary motivation. We develop an explicit framework for morphological typology, Network Morphology, and use the DATR formalism (Evans and Gazdar 1989a; Evans and Gazdar 1989b; Evans and Gazdar 1996; and Keller 1995) to express the analyses. The principles which we outline, especially in chapter four, are informal axioms over possible DATR representations. In this sense, our framework still requires further formal definition. However, we go much further than most current theoretical frameworks in striving for explicitness and have been driven by the desire to make particular predictions and claims about the morphology of Russian. As our analyses are represented in DATR, they have been tested to see that they do indeed derive the correct forms. Another more fundamental way in which we differ from other approaches is that we do not consider that a theoretical framework can limit one to just one theory of a particular language, but that it can reduce the logical space of theories. In fact, we show in chapters five and six that there are at least two possible theories of Russian nominal morphology which can derive the same forms for the adjectives and the first 1500 most frequent noun lexemes taken from Zasorina (1977). One of these theories is probably wrong, but we can tell that it is wrong, because of the predictions that it makes about the relative prominence of particular morphological classes.

By looking at morphology we are obviously assuming that it is a valid grammatical component in its own right. However, its place within modern linguistics has changed over time from being central at certain points to being considered peripheral at others. This is probably in part due to the fact that morphology is subject to varying degrees of exceptionality, an issue that we address.

As an example of earlier American structuralist approaches to morphology we may consider the work of Hockett (1958a: 137). The stock of morphemes and their combination was taken to be one of the constituent elements of the grammatical system, one of the three principal subsystems of language, which he considered to be 'a complex system of habits'. As an initial step towards understanding the nature of morphology, the term's use as an explanatory concept should be separated out from its use as a concept to be explained.

Morphology in the first instance, then, can be understood as an inventory of the morphemes of a given language and some stipulation as to the way in which they are combined. Right at this very point we encounter a not insignificant problem. The task of determining what a morpheme is is not as straightforward as might first appear. Although the phrase 'the smallest individually meaningful elements in the utterances of a language' (Hockett 1958a:123) has served well intuitively, it introduces the possibility of dangerous circularity into the argumentation. Precisely at
At this point do we encounter a fusion of theory and object of theory. In fact, we argue in section 1.2 that a lexeme-based approach is much better suited to analysing morphology than one which assumes that morphology is simply about affixation per se.

An inventory of morphemes appears to be a set of theory-neutral linguistic facts determined by distributional tests. The means for combining them is taken to be a question of theory. However, even the first assumption here cannot be taken at face value. The earliest of transformational theories (take, for example, that of Lees 1960) combined morphemes in the same way that they could combine fully formed words. At this particular stage we might characterise the situation as one in which there were morphemes, but no independent morphological explanans. This was at the stage in which there was what we could call a 'syntax of morphemes'. What remained to be defined - or was, rather, ignored - was the concept of wordhood.

1.1 Arguments for Morphology

There are two ways of justifying a separate morphological component as necessary in an adequate theoretical model. The first is to see the morphological component as an unfortunate but necessary means of tidying up all the messy bits with which the syntax cannot deal adequately. This view does not lack in justification, but taken to an extreme tends to assign morphology a peripheral role. The second way is to see morphology as a component which has a number of interesting properties and operations which differ fundamentally in nature from those of syntax. This view can be contrasted with one that treats morphological phenomena as essentially characterisable by the same types of rules; in other words, one where there is no significant difference between the rules of syntax and those of morphology.

1.1.1 Morphology is not Syntax

In section 1.2 we shall show that the idea of morphemes as minimal signs and as one-to-one pairings of sound and meaning is problematic. In addition to this, viewing morphology as reducible to syntactic principles has a number of undesirable consequences.

It is common practice to cite the work of Lees (1960) when illustrating the original power of transformations in generative grammar following Chomsky (1957). If we consider early generative approaches in which transformations could manipulate morphemes, it becomes clear that we are dealing with the meaning-altering properties of transformations. It is not our purpose to go deeply into the history of generative linguistics in the 60's and 70's of this century other than to take away those theoretical
Two of the theoretical considerations which count are the question of the morpheme as minimal sign and the question of syntax and meaning. It is, of course, common knowledge that the response of Chomsky (1970) to the generative semantics enterprise was to advance the *Lexicalist Hypothesis*. The *Lexicalist Hypothesis* appears to restrict the application of transformations to word-external operations, and also to deny their right to change word-class. This debate is still important, and there are good reasons to assume that syntax cannot manipulate items within the word, as argued by Anderson with respect to word-formation.

Anderson (1992: 22-37) considers the language Kwak’ala to illustrate the differences between the principles of syntax and morphology. He later also contrasts morphology and phonology (Anderson 1992: 42-47). Kwak’ala, Anderson argues, is a good language to consider as its syntax constrains the order of elements to a reasonable extent. Constituent order within a main clause has the verb in initial position followed by the subject NP, which is in turn followed by a complement (or complements). In certain clauses with more than one verb, the subject NP may come after the first verb (and before any others), or after the whole complex of verbs. Only the subject NP can come before a verb, but not before the initial verb. Anderson is at pains to point out that these are general rules of the syntax and not just preferences. He then contrasts these rules of the syntax with those internal to the word. For example, in a construction in which a nominal stem, which turns out to be the object, has a verbalising suffix attached, the object can come first. This is illustrated in (1.1).

\[(1.1)\]

\[\text{[V[N } \chi'\text{ina-] gila]}\]
\[\text{[V[N oil] make]}\]
\'to make (fish) oil' (Anderson 1992: 27)

A number of other examples are given to support this view of morphology as a set of principles separate from syntax. In addition to this, Anderson considers the question of noun incorporation and whether it can be genuinely treated as the incorporation of a separately generated argument. An important counter to this assumption is the fact that the apparently incorporated argument may still appear as the head of an independent object NP, as illustrated in (1.2).

---

1 Interested readers are referred to the work of Harris (1993).
In fact, Mithun (1984) presents a typology of noun incorporation and argues that it is still morphological in nature, although it is probably "the most nearly syntactic" of all morphological processes. Anderson further refutes the counterargument that "headless" phrases have their head incorporated, by arguing that there are constructions (in Kwak'wala) which definitely do not involve incorporation and which have phonologically unrealised heads. Other constructions allow for the apparent incorporation of modifiers, as in (1.3).

\[
\begin{align*}
\text{(1.3)} \\
\text{k'alxk'axa-'axa-ida bak'wama-xa t'əmxwali} \\
\text{eat raw-also-DEM Indians-OBJ gooseberries} \\
\end{align*}
\]

'The Indians also eat raw gooseberries.' (Anderson 1992: 34)

Anderson argues that to account for these in terms of incorporation would do violence to certain principles of syntax, as movement of modifiers should generally not be allowed and is ruled out by the 'Head Movement Constraint' (Travis 1984, Baker 1988: 53, Baker 1996: 284\textsuperscript{2}).

In this regard it is interesting to consider the position of Aronoff (1994) who specifically argues for a separate level of description, the morphomic level, partly on the basis of such constructions as the Latin 'Priscianic Formation' (first mentioned by Matthews 1972), where the future participle is based on the perfect participle. This means that the relationship cannot straightforwardly be characterised in terms of a particular morphosyntactic feature, because the past participle is generally passive. and the future participle always active. Aronoff develops the concept of the 'third stem' which itself does not have a morphosyntactic specification, or a semantic value. The question automatically arises whether this view is compatible with Anderson's arguments for morphology as a component with separate principles, as Anderson's arguments require the specification of stems for syntactic category - as nouns and verbs for example - in order to contrast this with the order in the syntax. It appears

\[\text{Baker (1996: 307-314) discusses the relative merits and demerits of the lexicalist (i.e. morphological) and syntactic approaches.} \]

\[\text{Baker (1996) crucially claims that polysynthetic languages do not have determiners, but it is not clear that this argument applies to the example (1.3).} \]
that Aronoff (1994) does still allow for the specification of the stem, in the Latin example at least, for its syntactic category.

"A fairly exhaustive search reveals a good number of morphological types built on the third stem but no semantic or morphological evidence that any one of them is basic to any other. I will therefore adopt the null hypothesis: that all third-stem types are based on the category verb (as their semantics dictates) and built on a particular morphomic form of the verb, the third stem. We therefore must distinguish the syntactic category of the lexeme on which a lexeme-formation rule is based from the sound form of that lexeme on which the phonological form of the output is built."


From the above it follows that a major role of morphology is to create lexemes of a particular syntactic category. Indeed, this is one of the standard assumptions about word-formation (derivation). In the list of properties which Scalise (1986) gives, this is at the top.

<table>
<thead>
<tr>
<th></th>
<th>WFR's</th>
<th>T's</th>
</tr>
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<tbody>
<tr>
<td>(a) can change syntactic categories</td>
<td>yes</td>
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</tr>
<tr>
<td>(b) can change subcategorization frames</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>(c) are local</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>(d) have binary branching properties</td>
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<td>no</td>
</tr>
<tr>
<td>(e) involve idiosyncratic information</td>
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<td>no</td>
</tr>
<tr>
<td>(f) involve phrasal categories</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>(g) are ordered</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>(h) include movement rules</td>
<td>no</td>
<td>yes</td>
</tr>
</tbody>
</table>

Table 1.1: The difference between Word-Formation Rules and Transformation
(from Scalise 1986)

What the above indicates is that word-formation is not easily reducible to principles of other components of grammar. Following Anderson, we may choose to highlight the fact that it is not a syntax of words, because it does not follow the principles of syntax. As an entity in its own right morphology has its own principles. Further, the view of Aronoff that there is a level of pure morphological functions, pure form, is also valid.

So far it should be clear that word-formation is not susceptible to the principles of syntax. One consequence of the Lexicalist Hypothesis is that it opened up word-formation as a legitimate area of study, as witnessed by the work of Halle (1973). In Jackendoff's (1972) work the (Extended) Lexicalist Hypothesis was
formulated as a restriction that transformations could only be used for operations on syntactic constituents. Others extended lexicalism further into the area of inflection (see Spencer 1992: 73). Lexicalism can therefore be divided into two camps. Weak Lexicalism is the view that inflection does not operate in the lexicon, and Strong Lexicalism is the view that it does.

One answer to the relation between syntax and inflectional morphology is to say that there is a Split Morphology (Anderson 1982). Inflection is relevant to syntax, but word-formation is not. According to Aronoff (1994: 15) the question whether "inflection and derivation are morphologically distinct is a separate and most likely subsidiary issue" from the question of Strong or Weak Lexicalism, which has to do with the definition of syntax. This is because the distinction between word-formation and inflection concerns the morphophonological realisation of either lexeme-internal (derivation) or lexeme-external (inflection) features. Indeed, it is obviously true that inflection is relevant to syntax, as it spells out the forms for particular grammatical features. The real problem comes when one assumes that morphemes are straightforwardly affixes directly paired with their featural content. Indeed, making the reasonable assumption that inflectional morphology is relevant to syntax should, we contend, lead one to treat it as a feature-interface, as argued for by Zwicky (1992: 356), for example. As we show in section 1.2 morphological operations are not all affix-based and may also be context sensitive. Yet treating inflectional affixes as the interface with syntax is not only based on the false assumption that morphemes are straightforwardly affixes, but it also has disastrous consequences for syntax, such as sensitivity to phonological environment.

1.1.2 Morphology-Syntax Interface

The Split Morphology Hypothesis represents a very specific kind of weak lexicalism. More importantly, it can, in its later incarnations, be contrasted with other views which split morphology. For instance, 'Distributed Morphology' and some of the work upon which it is based (Marantz 1988, Halle 1990, Halle 1992, Halle and Marantz 1993) treats morphology as being a 'post-syntactic' phenomenon. In Halle and Marantz (1993) there is a division between the 'Vocabulary' and the 'Morphology', which appears to account for inflection. The morphological component is one which restructures after syntax, and its position within linguistic theory is as illustrated in figure 1.1 (taken from Halle and Marantz, 1993: 114).
What is interesting to note about the figure taken from Halle and Marantz (1993) is that there is no place for the semantics of particular lexical items, nor is it stated exactly how derivation occurs. In this regard it is interesting to consider Corbett’s (1987) points regarding the case of possessive adjectives in Slavonic, where the noun from which the possessive is formed may control agreement. Presumably, a Distributed Morphology approach would have to derive such adjectives syntactically in order to account for the facts. It is then not clear how derivation of other words constrains agreement such that words are generally syntactic islands. Yet the most appealing solution is to make use of the semantic information available within the word. Note that the position of morphology within this figure, although it adequately captures the role of morphology as mediator between syntax and phonology has little to say about its role as the means for realising the forms of lexemes, which also combine semantic information with syntactic and phonological information.

In such a view, Morphology is the mediator between syntax and 'phonological form', as illustrated in Figure 1.2, a diagram taken from Noyer (1992: 14).
Figure 1.2: Morphology as the mapping between syntax and phonology (Noyer 1992: 14).

Noyer further divides the operations of the morphological component into two phases: the first deals with Merger (in the sense of Marantz 1988), linearization and impoverishment (Calabrese 1988; Bonet 1991) in which particular morphosyntactic features are deleted at the beginning of morphological derivation. Noyer (1992: 9) demonstrates with a comparative example of French, German and Russian.

\[(1.4)\]
\[
\begin{array}{lllll}
  il & elle & ils & elles & French \\
  er & sie & sie & & German \\
  оn & оHa & оnI & & Russian \\
\end{array}
\]

A filter for German and Russian *[pl gender] allows for the deletion of the gender feature in the first phase of the morphological component. Noyer argues that this falls out from the fact that gender is a feature which is lower than number in terms of a universal hierarchy. Indeed, our approach to Russian inflection adopts a particular ordering of features, as we show in chapter two. Furthermore, we tie this ordering up with the 'trigger' features of Carstairs (Carstairs 1984, Carstairs 1987: 107-24, Carstairs-McCarthy 1992: 204) and show that it accounts for why there is
sharing of plural morphology by nouns and adjectives in Russian. We do not, however, require an additional filter mechanism.

Noyer correctly points out that affix-based theories cannot account for neutralisation as exemplified by (1.4). Implicit in this is the view that these features are universally required by syntax. What is of interest here is that there appears to be a need for a feature to be eliminated in order to facilitate the mapping to phonological form. By extension, it can be inferred that there is an assumption that ultimately there must be a one-to-one correspondence between morphosyntactic features and the phonology which realise them. This question of exactly how morphosyntactic features are realised or spelled out is one which is of particular interest for the Russian nominal system and will later be used as an exemplification of how the theory of Network Morphology treats impoverishment in terms of underspecification.

In essence, the morphological component in the conception of theorists such as Halle, Marantz and Noyer allows for a universalist syntax which can make use of features which are not eventually realised phonologically. However, there is no reason to assume that one needs to delete a gender feature in the plural for the morphological component. As we show, all that is required is for syntax to ask for a form and the morphology will provide the most specific answer.

In addition, since the inflectional category of gender - which is what is meant by 'gender' here - may be determined by the semantics of the lexical item (Corbett 1991: 7-69), one would have to assume some mechanism whereby an undeleted gender feature for the singular was spelled out correctly in the case of such nouns as *d'ad'a* 'uncle', which appears to have 'feminine' endings but which has masculine agreement with modifiers and other syntactically independent elements. This problem need not arise if one is to attribute some status to inflectional class (as is done by Matthews (1974), Corbett (1982), Matthews (1991), Halle (1992) and Anderson (1992), for example) because this would allow for a mismatch between gender and declensional class. Indeed, we demonstrate that the sharing of plural morphology follows from the natural assumption that gender is not an inflectional category for nouns.
Noyer (1992), in line with much of the (affix-based) work on morphology, accepts that affixes are usually heads.3

"...I propose that affixes and X0s are isomorphic in the unmarked instance."
(Noyer, 1992: 9)

By affix we should probably read here the featural content of an affix. These features are then instantiated by default by a mapping to phonological form involving the phases in figure 1.2. This mapping may involve fusion, or fission, and so on. In this respect, the approach of Noyer, and of Distributed Morphology (Halle and Marantz 1993) is actually realisational and avoids the problems that Stump (1993 a) cogently highlights for a percolation based theory of morphology (qua phenomenon), by following realisational frameworks, such as that of Stump. However, the approach is quite clearly not lexeme-based, as it assumes that the affixes which attach to a stem are the heads of phrases. In the next section we argue for lexemes on the basis that morphological operations are context-sensitive.

Noyer's formulation allows for those cases in which the head of a syntactic phrase might merge with adjacent items, or, conversely, undergo fission of some kind, where the head is split. Most importantly, this view of affixes as the default head of a phrase entails with it a view of a 'principal exponent' for a given morphosyntactic feature.

However, the use of the various mechanisms implies that there is still a requirement for a one-to-one correspondence between phonological realisation and feature. If this were not the case, then there would be no need to go through all the processes of splitting or filtering out features. The problem with this view is that it requires a number of additional mechanisms, such as filters, and other means to bring about fission and the like. It therefore provides for a very indirect way of characterising and comparing across languages. As we go on to show, the filter mechanism, at least, is not required.

1.1.3 Morphology and Phonology

A standard assumption of most generative approaches to morphemes is that they have a unique underlying form, except in the few untypical instances where one

---

3 Generally in the approach of Williams (1981), for example, suffixes will be heads as they occur to the right of stems and come under the umbrella of the Right-hand Head Rule. However, he also uses this principle to account for examples where roots may be heads, as in the example of with-stand.
finds suppletion. This view means that most alternations of the form of particular morphemes have to be dealt with by particular phonological rules which provide the desired change. However, there are well known instances where particular phonological rules may or may not apply, depending on the level of structure within the word. Facts such as these led to the adoption of cyclic and later lexical approaches to morphology and phonology.

The idea of the cycle is found in certain theories of morphology, such as Lexical Phonology and Morphology (LPM), and it is basically that phonological rules may apply between operations of the morphology. The account of Halle (1963) of the Russian verbal system makes use of cyclic application of rules in order to account for the various consonantal alternations. The difference between the stem consonants in broš-u 'I throw' and bros´-at 'they throw' is accounted for by positing cyclic application of phonological rules. This is given in table 1.2.

<table>
<thead>
<tr>
<th>((bros+i+i)+u)</th>
<th>((bros+i+i)+at)</th>
<th>UR</th>
</tr>
</thead>
<tbody>
<tr>
<td>bros´+i+i</td>
<td>bros´+i+i</td>
<td>first bracket</td>
</tr>
<tr>
<td>bros´+i</td>
<td>bros´+i</td>
<td>truncation of vowel</td>
</tr>
<tr>
<td>bros´+i+u</td>
<td>bros´+i+at</td>
<td>bracket erasure</td>
</tr>
<tr>
<td>broš+i+u</td>
<td>-</td>
<td>TS (before rounded and unrounded vowel)</td>
</tr>
<tr>
<td>broš+u</td>
<td>bros´+at</td>
<td>output</td>
</tr>
</tbody>
</table>

**Table 1.2: Cyclic rule and transitive softening**

In the examples above, phonological rules eliminate adjacent vowels and induce 'transitive softening' (here /s/ -> /ʃ/) when a consonant is followed by an unrounded vowel followed by a rounded vowel. These rules must be ordered in relation to each other. In addition, Halle (1963: 120) also showed that they must apply in cycles. Quite apart from the questionable nature of the rule of 'transitive softening' we also see that an underlying one-to-one relationship is assumed.

This view of phonology and the one-to-one pairing of sound and meaning only follows if one considers morphology to be underlyingly affix-based. As we show in section 1.2 there are, in fact, a number of morphological operations, not just affixation, and there is no reason to assume that consonantal alternations could not be one of them.

Acceptance of this view of morphology also allows us to deal in a natural way with problematic areas from the other components of grammar. For example, the acceptance of Aronoff's view can be made to tie into an account of morphophonological alternations, such as the replacement operations discussed later in section 1.2. We
know that the consonantal alternations of Russian can occur in a number of environments, and their phonological environment is such that we cannot easily claim that these changes are the result of expected phonological rules, as in (1.5) where one appears to get velar palatalisation before the vowel /o/, and in (1.6) where one appears to get velar softening before the nasal /n/. (Our examples are given in a phonological transcription which is explained in Appendix 1.)

(1.5)  
pek-ŭ 'I bake'  peč'-oš 'you bake'

(1.6)  
č’elovek 'person'  č’eloveč’n-ij 'humane'

The point to note is that morphology here makes life easier for phonology, as it places a limit on the particular operations that phonology can do, rather than forcing additional mechanisms into the theoretical arena of a discipline which has to do with the perception and role of sound per se. This is an additional justification for adopting the view of morphology as a separate area of knowledge. Given the acceptance of the role of morphology as mediator between syntax and phonology, it is then reasonable to allow it a number of formal operations (as we argue in section 1.2) for realising morphosyntactic features. That is, if we take it as seriously as we take the other areas of linguistic knowledge. In addition, our view of the role of morphology also means that we make the assumption that syntax is phonology-free (Pullum and Zwicky 1988). That is, the rules of syntax are not sensitive to facts about the phonological form of grammatical words.

Any framework which does away with a morphological component would have to accept that its syntax could shunt around items which are problematic from this point of view. Most importantly we see that those areas which are problematic from a syntactic or phonological standpoint are not just dealt with in the morphology as a place to 'tidy-up', but they naturally fall within the remit of the principles which are considered to differentiate morphology from other parts of grammar.

1.2 Arguments for Lexemes

We have already given some of the arguments for morphology as a component of grammar. In this section we argue that the best approach to take is a lexeme-based one, as the concept morpheme is problematic if one considers it to be a one-to-one pairing of sound and meaning. Concomitant with this, inflectional morphology is the realisation of grammatical categories by morphological operations.
According to Spencer (1991: 12) one of the major sources of possible difference in any morphological theory is the extent to which it makes use of the metaphor of morphemes as 'things' or 'rules'. For the purpose of our discussion of the phenomena involved, we look at the way in which this problem has been approached by linguists of a number of theoretical persuasions. This is important, as it allows us to consider the way in which a particular view has been modified and taken on by a contemporary school, and whether the idea in its new modified manifestation obviates the problems that older proponents of it encountered.

A basic problem with the concept of morpheme is that it is not always easy to distinguish a particular meaningful element. We can exemplify this, somewhat arbitrarily, with the work of Hockett (1958a). The major criterion for determining what constitutes a morpheme is one of distribution. However, the use of distributional tests, while a valid heuristic, still leads to a number of problems. For instance, Hockett (1958a) concludes that words such as sister cannot be considered to be the combination of smaller elements sist and -er. On distributional criteria one can find a number of other 'minimal' units which are the same phonologically as sist-; cyst, for example. However, Hockett (1958a: 124) dismisses the possibility of establishing a morpheme on this basis because there is "no reasonable similarity of meaning" between it and the other occurrences of that combination of phonemes. Equally, if we wished to analyse other kinship terms, we would also find elements that appear to have no meaning on their own: broth-, fath-, moth- and so on. This still leaves 'unexplained' the fact that all these terms share a common element, which appears to indicate kinship. In addition, Hockett elsewhere is forced to recognise 'unique morphemes' such as the cran- of cranberry, because the second element is quite clearly analysable in meaningful terms.

These are very familiar examples. As our main concern is with inflectional morphology, we shall illustrate how assumptions about the one-to-one correspondence of meaning and form is problematic for inflection, and we shall also go on to consider definitions of inflection in section 1.3.

Hockett (1958b) discussed two different models of grammatical description: the Item and Arrangement model and the Item and Process model. These, again, are familiar models to linguists. The reader is referred to Spencer (1991, 1998) for a discussion and illustration of the issues involved. While Item and Process differs from Item and Arrangement in that it need not see morphology as agglutinative, neither necessarily contradicts the view of morphology as always involving a one-to-one mapping of meaning and form. For instance, one may choose to talk of a process which realises a particular discrete grammatical feature, but if a process is always
taken to realise only one feature, then it may be taken that this incorporates a view of the morpheme which accepts that there is a one-to-one correspondence of some kind. This consideration is independent of the two models mentioned above, and it is important to bear in mind that this distinction is often of greater import than merely alluding to a difference between arrangement and process.

As an illustration of the issues involved we shall consider the work of Trager (1953), where the term morpheme is used in a very specific way that differs a great deal from much of current usage. The justification for looking at work of this period is that it allows us to consider a central issue of what we mean when we talk of a 'morpheme', and as Matthews (1991: 123) says:

"Forty years later, one is tempted to consign them entirely to the dustbin of history. Nevertheless, the arguments are still instructive. For what we have here is a classic instance of an analysis which preserves the letter of a model perfectly. But it does so at the expense of its spirit."

Indeed, to discuss such analyses will make it clearer for us when others make appeal to the argument that "a morpheme is a morpheme is a morpheme" (Halle and Marantz 1993: 170).

An additional advantage of illustrating with the work of Trager (1953) is that he deals with Russian, the language which we describe in this thesis. In contrast with Trager's approach and later work which wishes to reduce morphology to a one-to-one pairing of sound and meaning, we accept Russian's fusional nature, cumulative exponence in the terms of Matthews (1991: 179-180). For example, in the Russian form ruk-a 'hand (sg nom)' the ending -a realises both singular number and nominative case. This is also referred to as multiple exponence (Spencer 1991: 51), where there is a many-to-one correspondence between meaning and form. This may be contrasted with extended exponence or overlapping exponence (Spencer 1991: 51) where there is a one-to-many correspondence between meaning and form. For example, in the Russian form bolgar'-in-a the stem augment -in realises singular number and the ending -a realises singular number and genitive case. Singular number is therefore realised twice by two different formatives. Both multiple and extended exponence are at odds with the view that morphology is underlingly agglutinative. Our Network Morphology treatment of features enables us to make a number of interesting claims about the relationship between nouns and adjectives. In addition, as Russian shows in its inflection, it illustrates well the problem of the relation between meaning and form, and yet many linguists have tried to reduce all inflection to agglutination.
In table 1.3 below we give the declensions of Russian nouns. For the time being this is done for expository purposes only, and no theoretical claims are made for this. This is, of course, not how Trager (1953) lays out the data. He also establishes allomorphs on the basis of contrast between nouns and adjectives. For the sake of simplicity, we consider the nouns. This has no bearing on the basic import of the argument that we develop in considering this view of morphemes.

First, we ignore for the present the status of the stress alternations in the nouns exemplified. Trager treats them as "separate morphs, forming suprasegmental morphemes." Morphemes are indicated by some arbitrary symbol. For instance, the nominative morpheme is $\sqrt{N}$. This is what we must bear in mind. The status of morphemes is articulated in terms of the "categories of inflection" (Trager 1953: 327):

"Each of the categories of inflection is considered to be represented by a single morpheme."

However, the major consideration here is the question of the categories of inflection. For, on closer examination, we see that these categories correspond to a meaningful element relevant to the syntax. In modern parlance the categories of inflection are morphosyntactic categories. What we call them is not of direct concern here. What is important is that we see that we are talking of 'content' in a certain sense. This is not the end of the problem. We must continue by considering the status of what are called 'allomorphs' in this analysis. As morphemes in this analysis correspond to the 'inflectional categories', as exemplified by the example given above, and a set of allomorphs corresponds to each morpheme, we find that for each fully inflected form, there will be a combination of allomorphs representing the morphemes which correspond to inflectional categories.
Looking at table 1.3, we may consider how Trager (1953) deals with the nominative plural of stol 'table'. He analyses stol as stol-i-0, in which the final 'zero' element is an allomorph of the nominative morpheme, also to be found in the nominative singular, stol-0. The underlying assumption here appears to be that there is some kind of one-to-one pairing. It would be tempting to say that it is a one-to-one pairing of form and meaning. The situation is far more complicated than that. For the morpheme itself is here a highly abstract element, which corresponds to an inflectional category, or, as we have said, a morphosyntactic feature. In fact this is the problem. It is posited as an element to maintain the constant of form and meaning, with the differences being dealt with by the use of allomorphs, but the morpheme here, as a featural element, is more a unit of meaning which can have a number of formal realisations. The same would be true of phonological realisations which are not linear, and might be thought of as processes, if they are thought to have a one-to-one correspondence with the 'content' which they express. Hence, any theoretical framework which accepts such a straightforward view of affixes will come across severe problems in deciding what the content of affixes may be.

So the question of what constitutes a morpheme is more problematic than may appear at first blush. In fact, this problem has always been present, and has usually been obviated by an unquestioned conflation of the concept in both rules and

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4Here and throughout this thesis we treat the different sounds [i] and [y] as allophones of the phoneme /i/. In appendix 1 we explain the phonological rules assumed in our analyses of Russian morphology.
phonological material. Yet this concept was readily taken as fundamental in early
generative approaches which often rejected morphology as a separate component of
grammar. Anderson (1992: 17) makes the point that the acceptance of the morpheme
as an unquestionable entity in early generative grammar entailed the rejection of a
morphological explanans.

"Generative grammar thus ended up as a theory based centrally on the
morpheme as a fundamental linguistic unit, but in such a way as not to require
any particular theory of morphology."
Anderson (1992: 17)

According to Zwicky (1987) a distinction must be made between the
morphological rules and the actual operations which those particular rules select to
realise the morphological categories to which they apply. Following Hoeksema and
Janda (1988) we shall divide the universe of morphology up into four particular types
of operation: addition, metathesis, replacement and subtraction. Wherever possible
we shall try to illustrate these various kinds of operation with examples from Russian.

Addition

Context-free addition is the most typical morphological process, in which
affixes are attached to stems without any restrictions related to the phonology of the
combining elements. The prepositional singular *stol-e* 'table' might be considered the
result of context-free addition, as the ending *-e* is suffixed irrespective of the
phonology of the stem and dependent only on membership of a particular declension.5

Context-sensitive addition covers affixation, infixation, circumfixation and
reduplication. Declension I genitive plurals in Russian are an example of context-
sensitive affixation, as the ending *-ov* will be attached, if the noun stem is non-
palatalised or non-palatoalveolar (hard), but the ending *-ej* will be used, if the stem is
palatalised or palatoalveolar (soft). This is illustrated in (1.7) and (1.8).

(1.7)

\[
\text{stol} \quad \text{(declension I)} \quad \rightarrow \quad \text{stol-ov} \quad \text{('table' (genitive plural))}
\]

(1.8)

\[
\text{žitel'} \quad \text{(declension I)} \quad \rightarrow \quad \text{žitel'-ej} \quad \text{('inhabitant' (genitive plural))}
\]

5 However, even here we have to take into account the fact that vowel stems which end in a vowel in
Russian are indeclinable. So even this basic nominal affixation is subject to sensitivity of some kind.
There do not appear to be any straightforward examples of infixation in Russian, as the insertion of fleeting vowels in phonological forms of certain lexemes located within a particular morphosyntactic array (usually as nominative singular or genitive plural) is generally considered to be the result of syllabification. A clear-cut example of infixation, in Chamorro, is cited by Hoeksema and Janda (1988: 207) from Topping (1973). The verbal infix -um- is inserted in the non-future tense of certain intransitive verbs when the subject is singular. A plural subject requires the prefix man-. This is illustrated in (1.9) and (1.10).

(1.9)  
g-um-upu yo'  'I flew'

(1.10)  
mang-gupu siha  'they flew'

As Hoeksema and Janda point out, Ultan (1975) shows that infixation can be defined in terms of the marginal elements of a stem. It can be defined either with reference to the right edge or left edge of a stem.

Circumfixation, as a purely surface phenomenon, can be found in Russian, although it is limited to particular lexemes (i.e. it forms new lexemes). Certain Russian verbs have a combination of some prefix and the so-called reflexive suffix -s’a, where the combination without the suffix is unacceptable. This is illustrated in (1.11) and (1.12).

(1.11)  
spat’  'to sleep'
vi-spat’-s’a  'to sleep thoroughly'
*vi-spat’

(1.12)  
ždat’  'to wait'
do-ždat’-s’a  'to wait for a long time'
do-ždat’
*ždat’-s’a

This does not appear to be a general phenomenon of Russian morphology. For the first example, we find that there is a verb spat’-s’a. used as an impersonal verb with dative subject and the meaning 'to dream'. It would therefore be possible to construct a tenuous argument that the prefix vi- is attached after the reflexive suffix. Note, however, that we run into a problem with the other examples, if we assume that
word-formation should always form acceptable lexemes. In fact, this assumption would force on us the view that we are dealing with circumfixation, which in turn emphasises the point that we have multiple exponence of the meaning changes associated with the word-formation. Furthermore, this is also pertinent to inflection, because the formative -s'á must occur outside of person and number agreement in the verbal paradigm, as we discuss in the next section.

Reduplication does not appear to be found in Russian. It usually involves addition of a form based on part of the unreduplicated stem. So this involves sensitivity to the phonology of the item to which the reduplicated part is being added. There are many interesting examples from the literature. Spencer (1991) cites a number of examples from Tagalog. In this regard it is important to note that morphology allows in principle for operations sensitive to the phonology of the various elements involved, a characteristic which distinguishes it from syntax in general.

**Metathesis**

Metathesis is understood as a purely historical phenomenon as regards Russian. Hoeksema and Janda (1988) consider two types of metathesis, consonant/vowel and consonant/consonant, with examples from the Austronesian language Rotuman. Again, the important point to note is that the context-sensitive operation here is a particular property of morphology per se.

**Replacement**

As pointed out by Hoeksema and Janda (1988) this is usually known as ablaut or gradation. All of the examples they give involve vowels, but we can also extend the term to cover consonantal alternations which are not covered by automatic phonology. This context-sensitive phenomenon is to be found in Russian. Russian is particularly interesting in this regard as it has consonantal as well as, less general, vowel replacement, as in (1.13) and (1.14).

(1.13)
\[ \text{čelovek n. 'person'} \quad \rightarrow \quad \text{čeloveč-n-ij adj. 'humane'} \]

(1.14)
\[ \text{u-govor'-it' perf.} \quad \rightarrow \quad \text{u-govar'-iv-at' impf. 'to persuade/urge'} \]

**Subtraction**

Darden (1988) argues for a truncation-based (subtractive analysis) of certain Russian derivational phenomena, and Aronoff (1976: 95) cites examples from
Isačenko (1972) which appear to indicate that this is required, as in examples (1.15) and (1.16).

(1.15)
leningrād (noun) -> leningrādskij (adjective)

(1.16)
tómsk (noun) -> tómskij/*tómskskij

In (1.16) we see that a stem in -sk must have this 'truncated' before the suffix -sk.

Table 1.4 summarises the operations we have discussed (based on Hoeksema and Janda, 1988). Those which are shaded may be found in Contemporary Standard Russian, although some are more central than others.

<table>
<thead>
<tr>
<th>Different Operations of Morphology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADDITION</strong></td>
</tr>
<tr>
<td>Context-free</td>
</tr>
<tr>
<td>Context-sensitive</td>
</tr>
<tr>
<td>Affixation</td>
</tr>
<tr>
<td>Infixation</td>
</tr>
<tr>
<td>Circumfixation</td>
</tr>
<tr>
<td>Reduplication</td>
</tr>
</tbody>
</table>

Table 1.4: Morphological Operations (based on Hoeksema and Janda 1988)

Often connected with the idea of morphological operations which realise a particular derived stem or grammatical word (i.e. a member of a paradigm) is the notion 'lexeme'. The lexeme (Matthews, 1972; Stump 1998: 13) is a syntactic entity in the sense that it is an abstraction over a number of possible realisations. The

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6 There appears to be some effect here in which 'reduplication' is avoided, but it does not appear that this can be understood as a straightforward requirement that affix repetition be avoided. For instance, it cannot be the case that the illegal formation kor ičn ’ov-ij 'brown' > *kor ičn ’ov-ovat-ij 'brownish' is ruled out because of repetition of affixes, as the first affix is -ov, but the second -ovat. However, there is repetition of morphonology.
important point to bear in mind is that our conception of morphology assumes that its purpose is as a mediator between syntax and phonology. Furthermore, in the view of syntax that we assume, semantic information must be made available so that an appropriate semantic representation can be built up from the syntax. Lexemes combine this semantic information with form and syntactic information. In Distributed Morphology (Halle and Marantz 1993), as we discussed it in section 1.1.2, we see that morphology is ordered between syntax (SS) and phonology (PF). We more or less accept this view that morphology mediates between syntax and phonology. However, we also adopt the lexeme as an important construct, because it is the point at which syntactic, semantic and form information comes together.

1.3 Defining Inflection

The first and major distinction to be made between the two kinds of morphology is essentially a functional one (the term function is here being used in its more common non-mathematical sense). The function of inflectional morphology in the terms of Anderson (1982) is its relevance to syntax. Of course, the question then revolves around how it is relevant. But the point to be borne in mind here is that, although it does not necessarily follow, a functional distinction, in the sense we mean, will often place an emphasis on modularity, as the information provided by particular morphological functions will be accounted for by a particular module rather than another. For instance, the syntax of Russian will require a distinction between the subject and object of an action of some kind; or the agent and patient of that action. I prefer the terms subject and object, because they indicate grammatical meaning.

The relations of subject and object may be encoded either by marking on the head of a sentence, such as a verb, or by marking a dependent, such as marking a noun phrase with case, for example. In addition syntax also allows for configurational encoding in the sense that subject and object could be defined in terms of the constituent structure of a sentence. Inflectional morphology, which determines the word-form for a given combination of features, including those for the default subject case, nominative, for example, is relevant to syntax in so far as the features with which it deals are relevant to syntax. As syntax makes use, for instance, of number, person and case features to determine agreement between syntactic elements, we can see that this is common ground for both inflection and syntax. However, in making clear the concept of relevance for syntax we have already made appeal to other

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7 It could, for example, in transformational grammar and earlier versions of Government Binding Theory. This no longer appears to be the case, however. See Haspelmath (1994: 13n4).
possible distinctions: inflection is involved in agreement, and inflection makes use of similar (or the same) features as syntax. To be noted is the intimate link between these distinctions and the one based on relevance to syntax. Of course, a lot will depend on how we define our syntax, but the point is that an adequate theory of morphology, more specifically inflectional morphology, should make work easier for syntax.

If the main purpose of inflection is to provide the correct word forms for the syntax, then it would appear that word-formation does not have a mirror-image task for another component or module. Rather it is defined - certainly if you use the term word-formation - in terms of its own place within a theory of grammar. However, there is some ambivalence in the term word-formation. In our view word-formation is concerned with the formation of lexemes (see Matthews (1991: 26) for a simple explanation of this term). If we consider the main function of word-formation to be the creation of new lexical items, new items of vocabulary, and the role of inflection to give the correct inflected forms of those lexical items (see Mel'čuk, 1982: 82), then we immediately set up a neat opposition. The distinction between word-formation and inflectional morphology here in terms of their function can be expanded upon. This brings us on to the perennial questions of productivity and regularity and how these are used to distinguish inflectional morphology and word-formation.

1.3.1 Regularity and Productivity

'Regularity' and 'productivity' are terms which crop up in much discussion of linguistic phenomena, yet they are not always kept apart, when they could often stand for two different concepts. In my discussion of these ideas and their application to inflectional and lexical morphology I take their meaning as defined in (1.17) and (1.18) below.

(1.17) Regularity

If something is considered to be 'regular' it means that it can be defined in terms of a rule.

(1.18) Productivity

The concept of 'productivity' can only be applied when considering a regularity. To say that something is 'productive' is to claim that the rule in terms of which it
is defined either has a large number of corresponding attested forms or can be used to create new words.  

In the definitions above, I have made appeal to concepts which many linguists would consider to be easily understandable. Indeed, I have relied on this fact. However, when we talk of a rule, it must be remembered, for the sake of the theory/framework which we will introduce, that what is meant by rule should be taken to be a declarative correspondence.

In the Network Morphology universe (see chapter two) we shall talk of 'facts'. These facts can be understood as regularities. Furthermore, to talk of a particular word when discussing a rule is, perhaps, to imply that we can talk of one particular item or thing as 'regular'. However, what we really mean when we say that something is regular is that there is a definable relationship between two or more things or items, and therefore the regularity of a particular word only makes sense if we compare it with other words.

Productivity is therefore an evaluation of rules or regularities and is also a scalar concept. The confusion about productivity and regularity results from this scalar aspect of productivity and the confusion about what a rule is. If a rule is of such low productivity that it applies to one lexical item only, then its status as a rule is probably also in doubt, as there will probably be no evidence to determine whether the relations which it defines are valid. It is, of course, theoretically possible to find a given lexical item which matches the conditions of a rule and which may be the only item which does this. In this case, we could actually say that the rule was totally productive, as it applied in all those places where it could apply. However, the likelihood of formulating such a rule and of finding only one item which matched would make us rightfully suspicious. The point to bear in mind is that we will have to

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8 Corbin (1987: 177) proposes to abandon the vague notion of productivity and to talk instead of 'regularity', 'availability' and 'yield' (my translations of 'regularité', 'disponibilité' and 'rentabilité' respectively). The definition of the first term appears to be circular, because Corbin refers to the 'regularity of the products of a rule' (my translation), the second deals with whether the affix can form unattested new items, and the third has to do with the number of attested forms produced. Given the problems with the first term, it is not necessarily clear that this division compensates for the vagueness. This issue is also discussed by Carstairs-McCarthy (1992: 32-38). We also show in chapters five and six that one cannot assume for inflection that the default realisations for singular dative and singular genitive are necessarily the ones represented by the most morphological classes.
be explicit about how we understand productivity. The work of Bauer (1988) is the most explicit on what it means to talk of 'productivity', and there (Bauer, 1988: 69) two possible definitions are considered.

(1.19)

"(a) A process is said to be fully productive if it applies to every possible base, and those bases are defined solely in terms of their major category (noun, verb, adjective)

(b) A process is said to be fully productive if it applies to every relevant base, defined in terms of a number of specific restrictions..."

It becomes immediately apparent that this is not a trivial consideration. For example, one of the assumptions, and often one of the major defining differences between word-formation and inflection in the eyes of many linguists, is that inflection is productive and derivation is not. However, if we were to accept the definition of productivity in (1.19 a), which Bauer (1988) claims is often the one taken in the literature, the system of noun inflections in English could be taken to be a lot nearer to fully productive than that of Russian. If we consider again the Russian nouns in table 1.3 (section 1.2) it is clear that we cannot define the processes which add declensional endings in Russian solely in terms of them being added to a noun, as there would then be no way to define those processes which applied only to the first declension, for example.

Of course, we could still use the definition in (1.19 a) but it would restrict us very greatly in using the term 'productivity' almost to the point where it should hardly crop up in any theoretical text. Even if we wished to use it for a subset of inflectional processes, such as, say, the realisation of the instrumental, dative and prepositional plural, which could be defined purely in terms of major category, we would still find exceptions such as det'mi 'children' (instrumental plural), which is exceptional because it does not have the theme vowel before the ending. Productivity is therefore a term that we need to be wary of. If it is to be of any use to us, it should be used more in terms of Bauer's definition (1.19 b). We may also take it as read that there are very few (maybe even no) morphological processes which are fully productive in the sense of (1.19 a). Interestingly enough, it is not entirely clear which definition of productivity Scalise (1986: 114) has in mind in his point VII regarding the difference between inflection and derivation. For, on the one hand, "It is in general possible to attach to any word the entire set of inflectional endings associated with the word class in question", and a few lines later, "We can thus say that inflection is paradigmatic." In fact, this highlights a very important point. Namely that the view of productivity...
that definition (1.19 b) entails can handle a paradigmatic view of inflection, whereas
definition (1.19 a) would have nothing to say about paradigms, other than that
diacritic features marking the paradigm for a given noun or verb would mean that the
process of inflection which that noun or verb underwent was not productive. In other
words, to claim that inflection in languages such as Russian (where there is more than
one paradigm for nouns) is highly productive is to accept to a certain degree the
validity of the concept of inflectional class, and by virtue of this to accept the
definition (1.19 b) of productivity, wherein the 'specific restriction' for the lexeme is
the specification of its inflectional class.

1.3.2 Further differences

As we continue with our discussion of word-formation and inflectional
morphology we shall find that the distinctions made by theorists regarding the
differences between these two areas are in no way watertight, just as we have seen
that the concept of morpheme is problematic. Our purpose here is to consider the
standard picture of morphology and the differences between inflection and word-
formation (derivation). Scalise (1986: 103-115) outlines a number of the key
differences between inflection and word-formation.

As Aronoff (1994: 15) has pointed out, the Weak versus Strong Lexicalism
issue is essentially a subsidiary one for morphology. If one claims that morphology is
a feature-interface and that syntax is about the generation of phrase structure nodes
containing morphosyntactic features, one can adopt the weak lexicalist position that
claims that inflection is relevant to syntax, and still treat morphology as a separate
component.

After considering those linguists who have supported either strong or weak
lexicalism, Scalise goes on to state that it is obvious that those who support weak
lexicalism must automatically assume that inflectional rules are different from
derivation rules. He adds that strong lexicalism, on the other hand, does not
necessarily entail such a distinction, and supporters of strong lexicalism can therefore
be divided further in terms of whether they support a distinction between derivation
and inflection. One of the problems in discussing such a split is that the position of
the lexicon is not made clear. Indeed, the status of a separate morphological
component is not made clear (or implicitly rejected).

Plank (1994) provides a list of criteria for distinguishing inflection and
derivation and shows, using English as the example, that these criteria provide a
gradation. Scalise (1986: 103) argues for a division of inflection and derivation. We
shall go through the argumentation and consider its validity.
IR's never change the syntactic category of a word, while DR's may change it. (Scalise, 1986: 103)

This is a standard view of inflection which corresponds to the position that it is 'relevant to syntax'. Note that (1.20) does not tell us whether diminutive formation, where an affix attaches to a noun to form another noun, is inflectional or derivational. This is because under (1.20) change in syntactic category is not a sufficient condition to be defined as either derivation or inflection. Indeed, Scalise (1986: 131-133) treats the 'evaluative' suffixes of diminutive formation as special. The formulation in (1.20) is really a requirement that a lexeme be of one category together with all its (inflectional) forms. If one were to accept that verb participles belong to the adjectival class, this view might be falsified if the participial forms were treated as belonging to the same lexeme as the other verbal forms.

Inflection is always peripheral with respect to derivation. (Scalise, 1986: 103)

While defending this position, Scalise cites a number of counterarguments to what he terms the Uninflected Base Hypothesis that derivational affixes cannot attach to inflected words. These are the formation of adverbs in Romance languages, where the adverbial affix attaches to the feminine form of the adjective, and the attachment of a derivational suffix (for noun-formation) to a comparative (Booij 1977: 47). Scalise argues that this is to be treated in terms of suppletion and is not a counterexample to the generalisation in (1.21). Evidence against (1.21) is presented by Stump (1990) and Booij (1993), among others. Stump shows with examples from Breton that plural marking can occur inside of diminutive marking, the latter being word-formation. Booij (1993) makes a distinction between contextual and inherent inflection and argues that it is possible for word-formation to occur outside of inherent inflection (such as number marking). Stump (1991) makes the generalisation that inflection may appear inside of category-preserving word-formation. An example of this type where inflection occurs inside of word-formation can be found in Russian verbs, where addition of the so-called 'reflexive' marker -s'â, sometimes accompanied by a prefix, can form new verbs from other verbs. This marker occurs outside of person (or gender) and number inflection. This is illustrated by the verb *do-ždat'-s'â 'to wait (for)' which we have already seen in (1.12). It is formed from the verb *ždat' 'to wait'. In (1.22) we give the past singular feminine form of the verb *do-ždat'-s'â 'to wait (for)' (see also Spencer 1998: 131 and Stump 1998: 32).
do-žda-l-a-s’
PREF-wait-PAST-SG.FEM-REFL
’she waited’

It should be noted that number is not an inherent inflection for verbs (Booij 1993: 30), and this verb also inflects for person and number in the future with the formative -s’a occurring outside of the markers of person and number. While example (1.22) may be problematic for Booij’s (1993: 42) claim that only non-contextual inflection may feed word-formation, it still obeys Stump’s generalisation that inflection may occur inside of category-preserving derivation.9

(1.22)

(1.23)

(III) DR’s and IR’s are sensitive to different properties of their bases.
(Scalise, 1986: 105)

Scalise lists a number of features to which both inflection and derivation could be considered sensitive. Both inflection and derivation are sensitive to syntactic category, because inflection must attach the proper endings for verbs or nouns, and so on, and derivation must be sensitive to syntactic category, as this falls out from the fact that derivation is usually considered to change syntactic category. Equally, derivation may also take account of the inflectionally relevant paradigm information. In Russian, for example, secondary imperfective verbs formed with the suffix -iv will attach to a jotated root, if the verb from which they are formed is originally a second conjugation verb, whereas they will attach to a non-jotated root, if the original verb is a first conjugation one.

(1.24)

zasvet’-it’ (conjugation II) --> zasveč’-iv-at’ 'to light'
razočarov-at’ (conjugation I) --> razočarov-iv-at’ 'to disenchant'

In addition, derivation is also shown to be sensitive to subcategorization features, as English adjectives in -able, for example, can only be attached to transitive verbs. On the basis of Italian data regarding the choice of auxiliary verb (‘to be’ or ‘to have’) in compound tenses Scalise also argues that subcategorization is relevant to inflection. However, it is relevant to inflection in virtue of its role in syntax, and so

9 Although Stump (1998: 18) shows, with examples from Breton, that it is possible for category-changing derivation to occur outside of inflection.
this assertion of inflection's subcategorization-sensitivity can be reduced to the general assumption that inflection is relevant to syntax.

Following Aronoff's (1976: 107) work it is considered that derivation is sensitive to the selectional restrictions of a base, but that inflection is not. One of the standard examples is that the suffix -ee attaches only to verbs which permit animate direct or indirect objects; thus, we get employee, payee, but not *travelee.10 We also get examples with the prefix re- (John punched Bill/*John repunched Bill and John punched a hole in the paper/John repunched a hole in the paper), where the prefix may occur only where the semantics of the base verb involve a change of state (Aronoff 1976: 47; Scalise 1986: 45). Are these two phenomena to be explicated in the same way? Selectional restrictions are part of the semantics of the base verb, and it would seem reasonable to assume that in both cases the affixation is sensitive to the semantics of the word from which the new word is formed. If this is true, then we are making a statement that derivation is sensitive to the semantics of the bases, whereas inflection is not. As we shall see, although this may be true in general, there is an example in Russian where semantic features do have to be taken into account in order to determine the form of the so-called 'second locative' in Russian (chapters seven and eight). And more generally in Russian nominal inflection, we have to be able to deal with animacy and the assignment of the correct form of the accusative. If the generalisation in (1.23) means that word-formation is sensitive to semantics, but inflection is not, then it is problematic.

It may well be for the reason above that Scalise (1986: 105) differentiates 'selectional features' from 'other features'. Scalise argues that inflection and derivation are sensitive to different semantic features.

<table>
<thead>
<tr>
<th></th>
<th>DR's</th>
<th>IR's</th>
</tr>
</thead>
<tbody>
<tr>
<td>†count</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>†animate</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>†abstract</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>†common</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 1.5: The sensitivities of inflection and derivation

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10 However, possible counterexamples to the generalisation about -ee may be found. For example, the use of the word standee for standing passengers on Guildford buses.
Scalise argues that inflection is sensitive to the feature [+count], whereas derivation is not. So, for example, we cannot form a plural of a noun which is [-count], but we can find derivational processes which apply to both [-count] nouns and [+count]. So, it is possible to form č'aj-n'ik 'teapot' from č'aj 'tea', as well as lošadn'ik 'horse-lover' from lošad' 'horse'.

Scalise’s assumption that the features [+animate] and [+abstract] are not relevant to inflection cannot go unchallenged when considering Russian data. The data in table 1.3 in section 1.2 do not include any examples of animate nouns. If they did, then it would be apparent that the animate examples in the plural would take the same endings as the genitive to realise their accusative. Equally, any noun from declension I which is animate will also have a singular accusative which follows the singular genitive in its realisation. So the plural accusative of stol 'table', a declension I noun, is stol-i (as the plural nominative), whereas the plural accusative of mužik 'bloke', also a declension I noun, is mužik-ov (as the plural genitive), and its singular accusative is mužik-a (as singular genitive). Thus, inflection in Russian could be considered sensitive to the feature [+animate].

In addition to the general facts about Russian nouns given in table 1.3 of section 1.2, we also find that there are certain nouns which have an additional, or 'second locative' ending. This is only used in those instances where it has a genuine locative meaning. The noun port 'harbour' has such a second locative. In (1.25) the standard prepositional (locative) ending is used with the preposition o 'about', whereas in (1.26) the ‘second locative’ ending is used with the preposition v 'in'.

(1.25)

On č’asto govor’it o port-e.

he often talks about port-SG.PREP

'He often talks about the harbour'

(1.26)

Korabl’ v port-ú

ship in port-SG.LOC2

'The ship is in the harbour'

As the second locative has true locative meaning, it is not used with abstract nouns. Consequently, the word ugol 'corner/angle' cannot have the second locative when it is used in the mathematical sense 'angle'. This indicates that inflection may, under certain circumstances, be sensitive to the feature [+abstract].
The feature [\+common] is obviously not of the same kind as the others in Scalise's list. If it were considered to belong to the same set as [\+count], for example, this would lead to a contradictory evaluation of tests for sensitivity. As indicated earlier, we cannot form the plural of nouns which are [-count], and this is taken to show that inflection is sensitive to this feature. In Italian it is generally not possible to form the plural of [-common] nouns, and Scalise (1986: 109) argues on the basis of this that inflection does not apply to [-common] nouns (such as names) in Italian. Yet it was precisely this fact for [-count] nouns which indicated that inflection is sensitive to that feature. This then leaves a less clear-cut picture than the one Scalise presents.

<table>
<thead>
<tr>
<th></th>
<th>DR's</th>
<th>IR's</th>
</tr>
</thead>
<tbody>
<tr>
<td>[+count]</td>
<td>?</td>
<td>+</td>
</tr>
<tr>
<td>[+animate]</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>[+abstract]</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>[+common]</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

**Table 1.6: Shared sensitivities**

One may conclude that inflection may be just as sensitive to particular features of the base as derivation, but that there are probably differences in the generality of this sensitivity.

(1.27)

(IV) DR's and IR's "do" different things. (Scalise, 1986: 109)

Scalise again goes through a list of four items which may be changed by rules of derivation, but not by rules of inflection.

<table>
<thead>
<tr>
<th></th>
<th>DR's</th>
<th>IR's</th>
</tr>
</thead>
<tbody>
<tr>
<td>syntactic category</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>conjugation/declension</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>subcategorization</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>selectional features</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

**Table 1.7: Further differences between derivation and inflection**
A formal notion of rule is required to understand what is meant here. If one considers the inflection of participles, for example, it is clear that they may have adjectival endings. The assumption above would require that participles were separate lexemes, as derivation would determine their change in syntactic category, and not inflection.

It is not clear what it would mean for inflection to change the selectional features of the base. Selectional features are lexical properties, as they are part of the meaning of a given lexeme. To state that inflection cannot alter selectional features is really to assert that inflection does not create new words. Equally, as it appears that inflectional class (conjugation/declension) determines the realisation of morphosyntactic features, it would be difficult to see how inflection, whose task is to do this for syntax, could alter this.

(1.28)

(V) DR's change the conceptual meaning of the base, IR's change only the grammatical meaning of the base. (Scalise, 1986: 112)

This falls out from the view of inflection as relevant to syntax. It also means that phenomena such as "evaluative morphology" (Scalise, 1986: 132) - diminutives, augmentatives, and so on - cannot be considered inflectional.

(1.29)

(VI) DR's may reapply, IR's may not

This does not appear to bear up when one considers multiple case marking in the Non-Pama-Nyungan Australian language Kayardild (Evans 1995). In Russian it is possible to create words (lexemes) through successive application of derivational rules. In (1.30) inflection follows after a double hyphen, whereas derivation is shown after a single hyphen.

(1.30)

a. škol--a 'school'
b. škol'-ńiık--Ø 'schoolboy'
c. škol'-ń'ič-estv--o 'schoolboy tricks'

According to Scalise the crucial difference is that, in each instance, each layer of derivation creates an existing word. This is contrasted with inflectional examples where there is layering in the application. For example, we could consider the inflection of a Russian verb to realise the feminine singular past tense in (1.31).
Scalise's argument falls down with the example of the Russian verb, because "igra-l' 'played' is an acceptable existing word; it is the masculine singular past tense. Equally, one must note that it is not necessarily the case that derivation creates an acceptable word, as inflection is required to make it complete, or close word formation. The distinction made in (1.29) is therefore too vague to be of anything other than general diagnostic use, and misses the crucial point that particular rules of inflection indicate the closure of word-formation. The generalisation in (1.29) also falls out from the fact that inflection is discrete in its meaning.

(VII) DR's are not fully productive, while IR's are. (Scalise 1986: 114)

Productivity was discussed in section 1.3.1 and found to be more problematic than might be assumed. Scalise points out that "derivational morphology tends to exhibit gaps, due to a variety of factors" (Scalise 1986: 114). If we take these factors into account in the formulation of word-formation rules, then it might well be that these rules always form acceptable words. On this basis (1.32) is not coherent until we have a precise formulation of derivation which articulates the role of the "variety of factors". Furthermore, we do find gaps in inflectional paradigms. For example, in Russian there is no first person singular future perfective form of the verb pobed'it' 'to be conquer (perf.)', and the plural genitive form of the noun mečta 'dream' is treated as 'problematic' by Zaliznjak (1977: 213). In practice this gap may be filled by using the genitive plural form of another related lexeme mečtanjio 'reverie'.

(VIII) DR's are optional, while IR's are obligatory. (Scalise 1986: 115)

According to Zwicky (1993) (1.33) falls out from the syntactic relevance of inflection. Indeed, Scalise determines the validity of (1.33) on a syntactic basis, making the observation that there will never be a sentence where an inflectional rule has not applied, but there could be one in which no WFR (Word Formation Rule) has been used. The formulation of (1.33) is a matter of perspective in the sense that the question of obligatoriness is defined in terms of what must happen when the syntax requires it. On the other hand, if one were to consider the need for a particular lexical meaning to be realised, for semantic needs to be met, then a WFR may also be
obligatory. (1.33) is not an independent claim, but one contingent on the view that inflection is relevant for syntax.

1.3.3 Derivation and Inflection

We have seen how many of the distinctions made between inflection and derivation are not necessarily as watertight as one might assume (II, III, VI), while others require further precision to delimit the class of possible morphological systems (I, IV, V, VII, VIII). Indeed, as Plank (1994: 1672) points out, the most realistic view may well be one in which there is a continuum along which morphological categories may be ordered. One must also take account of the question of morphemes as a theoretical entity, because in certain instances the concept of rule in the generalisations I-VIII could be conflated with the concept morpheme, whereas in others it appears to be something else. Indeed, this problem is obviated, if one adopts a lexeme-based approach in which morphology spells out the features required by syntax.

1.4 Conclusion

We have argued that morphology is an area of grammar in its own right, and that it is not merely a repository for those phenomena which cannot be explained elsewhere, but that the very principles that justify its existence naturally account for these phenomena. Where possible we have tried to illustrate with examples from Russian.

It has also been shown that the distinction between inflection and derivation, as assumed by others, such as Scalise, is not as clear as is often asserted. Indeed Aronoff (1994) considers it to be a subsidiary distinction. There are different types of operation which realise particular grammatical features. As morphology has the task of realising the features of syntax, this means that we assume that syntax is phonology-free. It is therefore true in a sense that all of morphology is relevant to syntax, as it spells it out. In the next chapter we outline some of the basic assumptions of Network Morphology and show how our lexeme-based approach fits with a larger, connected, view of the linguistic system. In particular, we show that there are particular generalisations which can be made about morphology by ordering features relative to one another. This complements the lexeme-based realisational view of morphology that we have argued for here.
CHAPTER TWO

The Network Morphology Framework

2.0 Introduction

In the previous chapter we argued that morphology is a module of grammar in its own right. With examples from Russian where possible we illustrated the formal operations of morphology. Russian was well chosen in this regard, as it has examples of addition, replacement and subtraction. We claimed that a lexeme-based approach is the most suitable way of treating morphology. We also argued that the idea of morphemes as a one-to-one mapping of meaning and form was highly problematic, and indeed an untenable position.

This chapter introduces a theoretical framework, where the term 'framework' is used in the sense of Zwicky (1992: 328). We then go on to apply some of the principles of this framework, outlined in chapter four, to the analysis of Russian nominal inflection. We shall not formalise the theoretical underpinnings in this chapter, but outline them in informal terms. In the following chapter we will introduce a well-known lexical knowledge representation formalism as a possible choice for encoding analyses embedded within the framework, which is called Network Morphology. Its name falls out from certain assumptions that underpin it, as will soon become apparent.

Quite naturally, Network Morphology shares a number of assumptions about the representation of linguistic knowledge with other theoretically motivated frameworks. Flickinger (1987) developed an approach to the lexicon for HPSG in which complementation and part-of-speech information were combined in what he called a WORD-CLASS hierarchy, which looked like figure 2.1.

![Figure 2.1: The Word Class Hierarchy of Flickinger (1987: 20)](image-url)
In this hierarchy information could be passed down from a higher node, such as INCOMPLETE, to a lower node, such as TRANSITIVE. Generalisations at a higher node are inherited by the lower node. For example, it is stated at INCOMPLETE that any item which belongs to this class must take a complement of some kind. For TRANSITIVE it is further specified that items of this type must take a direct object complement in the accusative. Flickinger also allows for overriding information from a higher node. This means that the kind of inheritance being used is 'default inheritance'.

In order to illustrate what default inheritance is we leave the work of Flickinger to one side and illustrate with a Russian example. Let us consider a toy hierarchy for Russian nouns in which we wish to state that the usual ending for the singular prepositional of a Russian noun is -e. This is true for all classes of noun except for declension III, as is illustrated in figure 2.2.

![Figure 2.2: An example of an override in Russian morphology](image)

Generally, Russian nouns have the ending -e for the singular prepositional. This is the default ending. However, class III nouns have the ending -i which overrides the default specification of the ending for the singular prepositional. This is therefore called an override. As we shall see in chapter four, there are at least two kinds of override that we may wish to consider. One in which the override is of equal specificity as the default, as in the example in figure 2.2. Another is where the override is more specific than the default. That is where, for example, the override gives more information than the default. We shall see this in our treatment of the so-called second locative in chapter eight.

We return to the work of Flickinger in order to consider another dimension in the organisation of lexical knowledge in terms of hierarchies. The reason for doing
this is that he is explicit about the different sort of links that are used in inheritance hierarchies. Flickinger discusses the dashed lines in figure 2.1 and explains that they represent different kinds of links, but indicates that this need not be of great import.

"a subset link joins a class and one of its proper subsets, while a perspective link joins a class with a node that names one dimension along which that class will be sub-divided. It may prove to be the case that these two types of links need not be formally distinguished, since it seems that inheritance of information via the two types of links is the same." (Flickinger 1987: 17-18)

In the Network Morphology framework it is assumed that the difference between subset and perspective links, to use the terminology of Flickinger, is an important one.1 Whereas links of the latter type are hierarchical in that they indicate where nodes are more specific instances of a particular type, such as TRANSITIVE being a more specific instance of INCOMPLETE, it is not clear in what sense COMPLEMENTATION is a more specific type of WORD CLASS, although the relation between WORD CLASS and PART OF SPEECH may appear more obvious. Flickinger (1987: 19) indicates that the one feature that is stated as a default at WORD CLASS is LEXICAL with a value +.2 Whether it is valid to have this stated as the highest default, which can be overridden, is not a matter for us to discuss here. Rather than take issue with this particular view of lexical knowledge as reducible to what is in effect one large hierarchy, we shall motivate our own approach.

In the previous chapter we were at pains to reiterate the point made by others that morphology is governed by its own principles and constitutes a language module in its own right. Given this view it does not make sense to assume that morphological knowledge can be subsumed under a single hierarchy that accounts for the syntactic and form-related properties of lexemes. Therefore we must assume

1A property of Network Morphology which follows from the use of DATR to represent Network Morphology theories is that the multiple inheritance is orthogonal and therefore conflicts, so-called 'Nixon Diamond' effects (see Touretzky 1986: 11), do not arise. This is a consequence of requiring that Network Morphology theories are functional DATR theories (see Evans, Gazdar and Moser 1993: 39 for a definition of a functional DATR theory).

2Note that the writing of attributes in capitals is Flickinger's (1987) convention, and we use it here for discussing his work. This convention should not be confused with the Network Morphology convention of writing all non-terminal nodes in a morphological or lexemic hierarchy with capitals throughout.
that there are relations or links in lexical knowledge which are non-hierarchical. To put it in the terminology of our nascent framework we shall call these links network relations (similar to Flickinger's perspective links) and oppose them to the hierarchical links that we have seen exemplified for the COMPLEMENTATION hierarchy. We shall talk of links of this latter kind as hierarchy relations (similar to Flickinger's subset links). 3 Whereas hierarchy relations involve a link between a higher and a lower node in which, by default, any information could be inherited from the higher node, network relations involve a particular dimension of linguistic knowledge. These two types of relations are fundamental constructs of the Network Morphology framework.

As a consequence of our choice of putting emphasis on the different channels of inheritance we assume that lexical knowledge is not one large hierarchical structure with a top node generalising over everything else. Indeed, it would be hard to imagine what such a node would contain, if anything, of great theoretical magnitude. Instead, lexical knowledge is conceived as a network of information, where the term network is distinguished from the term hierarchy. This network does not contain a root node generalising over all other nodes. Rather, it consists of a series of parallel hierarchies (consisting of hierarchical relations) which are connected by network relations to form one network of lexical information.

2.1 Hierarchy Types

Network Morphology is lexeme-based (Matthews 1972: 160-161) in that it takes the lexeme, the pairing of syntactic and semantic information with its realisation in sound, and specifies the fully inflected forms for each combination of morphosyntactic features. Network Morphology builds on the lexeme-based approach by trying to generalise further the information that lexemes have in common.

Central to Network Morphology is therefore the Lexemic Hierarchy. This hierarchy is at the core of the network of morphological information. If we consider the lexeme STOL 'table' for Russian (see table 1.3 and appendix II), there are a number of facts that we may state regarding it. First, its syntactic category is noun. Second, it shares the same inflectional suffixes as the lexeme ZAKON 'law'. As with ZAKON, and other nouns, the forms which realise it may also occur as the head of

---

3 Use of defaults obviously means that a superclass does not necessarily strictly contain a subset of the information of a subclass. This is one of the motivations for our choice of terminology.
noun phrases (i.e. it is a 0-bar category, where bar is as defined in Gazdar, Klein, Pullum and Sag (1985: 25), for example). Of course, the fact that ZAKON is a noun and has a value for the category bar would also mean that it is a major category, as indicated by the hierarchical relation of MAJOR and NOUN in figure 2.1. STOL contains the kind of information we give in figure 2.3.

<table>
<thead>
<tr>
<th>STOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>syn cat = noun</td>
</tr>
<tr>
<td>syn bar = 0</td>
</tr>
<tr>
<td>root = stol</td>
</tr>
<tr>
<td>stem=root</td>
</tr>
<tr>
<td>infl</td>
</tr>
<tr>
<td>sg nom = X pl nom= X-i</td>
</tr>
<tr>
<td>sg acc = X pl acc= X-i</td>
</tr>
<tr>
<td>sg gen = X-a pl gen = X-ov</td>
</tr>
<tr>
<td>sg dat = X-u pl dat = X-am</td>
</tr>
<tr>
<td>sg inst = X-om pl inst = X-am'i</td>
</tr>
<tr>
<td>sg loc =X-e pl loc = X-ax</td>
</tr>
</tbody>
</table>

**Figure 2.3: The lexeme STOL 'table'**

Examining figure 2.3 carefully we see that much of the information about the lexeme STOL is not unique and is shared with a number of other nouns. For nouns, for example, we know that their syntactic category, or word class, is noun. This apparently trivial generalisation is obviously generally true, but even it is subject to exceptions. For example, nasekomojo 'insect', given in phonological transcription here, functions as a noun, but has adjectival inflection. If an item is a common noun, it will also be of bar level 0. So STOL shares its combinatory properties with most other nouns, as shown by the examples in phonological transcription in (2.1).

(2.1)
- etot stol. 'this table'
- etot kras'ivij stol. 'this beautiful table'
- eta ruka. 'this hand'
- eta kras'ivaja ruka. 'this beautiful hand'
The only information that is specific to the lexeme STOL as such is that its root has the form *stol*. Another generalisation that this noun shares with other underived nouns is that its stem (to which inflections may be added) is the same as its root. Importantly, STOL belongs to a class of nouns which all share the same inflections. However, these have been listed as information particular to STOL in figure 2.3. We would also wish to state that, for instance, ZAKAZ 'order' and ZAKON 'law' also have the same inflection as STOL. This is a problem which we solve shortly by introducing an inflection hierarchy.

Figure 2.3 gives an indication of just some of the information we would wish to know about STOL. However, the information given there is of at least two different kinds. On the one hand we have information regarding certain combinatory properties, those we have labelled 'syn cat' and 'syn bar', and on the other hand we have information regarding the form of the various case and number combinations. Bringing together this information is the purpose of the lexeme.

In addition to considerations about the form of STOL, we see that there are other noun lexemes, such as RUKA 'hand/arm', KOST' 'bone' and OKNO 'window', which have different inflections, but which share these inflections with substantial groups of other nouns. We shall also go on to see that there is also sharing of inflections within and between these classes.

The first and most central type of hierarchy that we must consider is the hierarchy of lexemes. This hierarchy does not contain all information regarding syntactic, semantic and inflection information for lexemes. Rather its purpose is to indicate at the various nodes of the hierarchy what particular kinds of syntactic information may be associated with, for example, semantic and morphological information. Most importantly, it provides pointers to information, if it is not available in the hierarchy of lexemes itself.

Let us imagine what a lexemic hierarchy for Russian would look like. It will either contain information of the kind in figure 2.3 or point to an address in another hierarchy where that information is available. A lexemic hierarchy for the nouns STOL, RUKA, KOST' and OKNO would look something like figure 2.4.
In figure 2.4 we have generalised that the bar level of any word will be 0 and that the syntactic category is 'noun' of any lexeme which belongs to the NOUN class. It is important to note at this point that the hierarchy we are describing here is not just a hierarchy of syntactic information. The COMPLEMENTATION hierarchy of Flickinger is a hierarchy of syntactic information, for example. Network relations exist between the lexemic hierarchy and hierarchies of syntactic, semantic and inflectional information. The lexemic hierarchy may involve evaluations of information from its own or another hierarchy to capture interdependencies which exist between particular types of information. For example, it may use semantic information regarding the arguments of a predicate to determine the (syntactic) subcategorization properties of an item. The assumption is that these interdependencies need not be total.

Interdependencies of this kind have already been dealt with in the Network Morphology framework (Corbett and Fraser 1993; Brown and Hippisley 1994: Fraser and Corbett 1995; Brown, Corbett, Fraser, Hippisley and Timberlake 1996; Hippisley 1997) and we shall concentrate in chapters five and six on the principles which determine the shape of the inflectional hierarchy. We shall also introduce modifications to deal with interesting areas of Russian morphology not yet considered. For instance, the second locative of Russian discussed in relation to Scalise's definitions of inflection and derivation, and treated in chapters seven and eight. This shows highly complex interdependencies related to some of those already dealt with in Network Morphology. For the time being it suffices to indicate that the separation of linguistic knowledge into different hierarchies associated by a lexemic hierarchy allows us to capture the interdependencies. The purpose of our discussion so far has been to introduce the lexemic hierarchy. Before we go on to section 2.3 we shall consider inflection.
If we look at table 1.3 again in chapter I we see that a number of inflections are shared across the classes. Table 2.1 contains shaded realisations that we could say are *default* realisations for all nouns. We ignore nominal stress, an issue that has been dealt with by Brown et al. (1996). Note that there are a number of additional generalisations which could be made, but we assume that a realisation which occurs in the majority of nominal classes (i.e. three) can be considered a *default* for the sake of illustration.

<table>
<thead>
<tr>
<th>SG</th>
<th>'table'</th>
<th>'hand'</th>
<th>'bone'</th>
<th>'window'</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom</td>
<td>stol</td>
<td>ruk-a</td>
<td>kost'</td>
<td>okn-o</td>
</tr>
<tr>
<td>acc</td>
<td>stol</td>
<td>ruk-u</td>
<td>kost'</td>
<td>okn-o</td>
</tr>
<tr>
<td>gen</td>
<td>stol-a</td>
<td>ruk-i</td>
<td>kost'-i</td>
<td>okn-a</td>
</tr>
<tr>
<td>dat</td>
<td>stol-u</td>
<td>ruk-e</td>
<td>kost'-i</td>
<td>okn-a</td>
</tr>
<tr>
<td>inst</td>
<td>stol-om</td>
<td>ruk-oj</td>
<td>kost'-ju</td>
<td>okn-om</td>
</tr>
<tr>
<td>prep</td>
<td>stol-e</td>
<td>ruk-e</td>
<td>kost'-i</td>
<td>okn-e</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PL</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>nom</td>
<td>stol-i</td>
<td>ruk-i</td>
<td>kost'-i</td>
<td>okn-a</td>
</tr>
<tr>
<td>acc</td>
<td>stol-i</td>
<td>ruk-i</td>
<td>kost'-i</td>
<td>okn-a</td>
</tr>
<tr>
<td>gen</td>
<td>stol-ov</td>
<td>ruk</td>
<td>kost'-ej</td>
<td>okon</td>
</tr>
<tr>
<td>dat</td>
<td>stol-am</td>
<td>ruk-am</td>
<td>kost'-am</td>
<td>okn-am</td>
</tr>
<tr>
<td>inst</td>
<td>stol-am</td>
<td>ruk-ami</td>
<td>kost'-am'</td>
<td>okn-ami</td>
</tr>
<tr>
<td>prep</td>
<td>stol-ax</td>
<td>ruk-ax</td>
<td>kost'-ax</td>
<td>okn-ax</td>
</tr>
</tbody>
</table>

Table 2.1: Shared nominal morphology

We see, for example, that plural dative, instrumental and prepositional are the same across all classes. Where there is no shading, some information cannot be generalised to the level of nouns, of course, and this is our reason for assuming a particular inflectional class. We might therefore wish to set up an inflection *hierarchy* along the lines of figure 2.5.

![Figure 2.5: A simple inflection hierarchy for Russian nouns](image)

At the node MOR_NOUN we may state the generalisations regarding the forms of the dative, instrumental and prepositional plural. A more detailed examination of the Russian inflectional system will be saved till a later chapter. The purpose here is to
illustrate that there are different *hierarchies* of information, here a lexemic and an inflectional *hierarchy*. We may now join them together as in figure 2.6.

![Diagram: Lexemic hierarchy and Inflectional hierarchy](image)

**Figure 2.6: The lexemic hierarchy and the inflectional hierarchy**

In figure 2.6 the inflectional *hierarchy*, with MOR_NOUN as its root *node* is connected to the lexemic *hierarchy* by means of *network relations*. Whereas the *relations* within the *hierarchies* are *hierarchy relations*, *network relations* connect *nodes* of different *hierarchies*. It is assumed that to have *network relations* between any *nodes* is possible. An even more restricted theoretical framework would place further limits on *network relations*. Note that this finally solves our problem as regards figure 2.3, where we wished to generalise the information that ZAKAZ, ZAKON and STOL share. Now the *facts* about inflection are not stated as idiosyncrasies of the item STOL. Rather, STOL is addressed to another *node*, by a *network relation*, and this *node* generalises the information that STOL shares about inflection with nouns such as ZAKAZ and ZAKON and thousands of others.

In figure 2.6 we state the *network relations* as stipulated at each lexeme *node*, such as STOL, RUKA, KOST' and OKNO. This will often still be required. However, we shall see that it is also possible to state interdependencies which predict which *node* in the inflection *hierarchy* an item belongs to. This may be on the basis of semantic or morphonological information, for example. Such interdependencies are stated as a *default* for noun lexemes at the *node* NOUN and involve a link between the *node* NOUN and one of the declension class *nodes*. It should also be noted that there is no link in figure 2.6 between the NOUN *node* and the MOR_NOUN *node*. This is because each lexical item inherits the necessary information from MOR_NOUN via the appropriate declension class. If interdependencies are introduced, they involve dynamic links between the NOUN *node* and the declension class *nodes* and it would be unnecessary to create a link.
between NOUN and MOR\textsubscript{NOUN}, as most of the default information at MOR\textsubscript{NOUN} is inherited via declension nodes. We show in chapter three how the diagrammatic representations, the dashed lines for network relations and the plain lines for hierarchy relations, translate into a formal representation using the DATR language.

2.2 Facts

As we have already seen from section 2.1, Network Morphology treats linguistic knowledge as a network of information, where nodes are connected to each other in hierarchy relations to form hierarchies, and where network relations exist between nodes of separate hierarchies so that the whole structure forms a single network of information.

It should be clear from the foregoing discussion that nodes are repositories of declarations about linguistic structure. The declarations in the terminology of Network Morphology are called facts (Brown et al. 1996: 61). In sections 2.4 and 2.5 we explain in more detail what paths and values are. A fact pairs a value for a path with that path.

We may illustrate what a fact is at a more concrete level. From figure 2.3 the trivial statement that the root of STOL is stol is a fact. We may therefore take it that 'root' is a path consisting of the single attribute 'root', and stol is the value paired with that path. In the instance in which we claim that the plural nominative of STOL is X\textsubscript{i-1}, and X can be replaced by the stem (which is the same as the root in the case of STOL), we see that the attributes are the number and case features 'plural nominative' and that the value is the concatenation of elements, one of which is another path. In this case we have stated that X can be replaced by the stem. Once we have set up our relations between the lexicem and inflection hierarchies, we shall have to generalise over all stems. Hence the choice of the variable X.

What is interesting about the inflection example is that the attribute combination 'plural nominative' is realised by reference to another path containing the attribute 'stem', plus a value. In order to understand facts further we must come to an understanding of the terms attribute, path and value.

2.3 Attributes

According to Pollard and Sag (1994: 2) attributes correspond to distinct levels of linguistic structure. For us to claim that there is an attribute 'stem' means to say that this is a level of structure and that the concept of stem has a reality for the structure of natural language. What makes the attributes 'plural nominative' different
from the attribute 'stem' is that the former do not represent different levels of linguistic structure, but rather the features of particular levels of linguistic structure.

Remember that we have already claimed that the network of morphological knowledge may be divided up into distinct hierarchies. Clearly, these hierarchies may also be considered to stand for distinct levels of linguistic structure. We may claim therefore that hierarchies are different levels of linguistic structure related by stipulation or on the basis of information from other levels of linguistic structure. We may also assign an attribute to name that level of linguistic structure.

Now, our choice of the English label 'inflection hierarchy' for the hierarchy that puts stems and endings together is somewhat misleading. This might imply that inflection and stem-formation are different, subject to different principles, and that therefore this should be interpreted as a kind of split morphology. In a certain sense this interpretation would have some validity.

As would be expected of a theoretical framework that takes morphology as its core area of study, we assume that there is a separate level of morphological structure that we shall label with the attribute 'mor'. When we talk of the inflectional hierarchy we mean that hierarchy which provides values for the 'mor' level of linguistic structure. As this hierarchy combines stems with endings, or may specify the kind of stem required when talking of introflection (see Skalěčka 1979: 22), it is clear that it deals with the whole of word-structure in a certain sense. However, information regarding the stem, or indeed the ending may be stored in another hierarchy. For example, the Russian noun bolgar'in 'Bulgarian' has a plural stem bolgar- which loses the formative -in and for which the last element is the hard variant of the phoneme pair /r/ and /r/. This could be stated in a separate hierarchy which makes generalisations about stems. The sense in which this is not split morphology is that we still assume that the various hierarchies involved choose from the same inventory of operations (as table 1.4 in chapter 1), and importantly we still assume that morphology is not split in terms of syntax being able to manipulate the formatives of inflection. Morphology is a feature interface, not a formative interface.

The Network Morphology term that we choose for the attributes which label the various levels of linguistic structure is hierarchy identifier. As information at each hierarchy is information which belongs there, because it is part of that level of linguistic structure, we adopt the convention that all information that appears in a particular hierarchy must be labelled with the hierarchy identifier attribute for that hierarchy. The information that a particular item belongs to a particular level of linguistic structure is still quite general information. There are a number of items
which belong at the morphological level. More specifically, for noun lexemes we
know that there are 12 morphosyntactic slots (some realised by identical forms)
which belong to the level of morphology. Following convention, and also in order to
prefigure our use of the DATR formalism, we shall place the 'mor' attribute first in a
sequence in order to indicate that it includes the features which follow, as in (2.2).

(2.2) mor sg acc = stol

It would not however make sense to write out a combination such as that in 2.3.

(2.3) sg mor acc = stol

This is because the singular does not include all of morphology. It excludes plural
morphology, for example. The order of the features 'sg' and 'acc', as well as all other
case and number features, is discussed in the next section on paths. The ordering of
these features is determined by typological considerations.

As we order attributes from left to right on the basis of how inclusive they are,
it is a principle of the framework that the hierarchy identifier should always occur
first in a sequence. Furthermore, all hierarchies, except the lexemic hierarchy, will
be labelled with their hierarchy identifiers. The lexemic hierarchy is excluded,
because it brings together information from various levels of linguistic structure.
and therefore has a reserved status. Possible hierarchy identifiers, and therefore possible
levels of linguistic structure, are given in table 2.2.

<table>
<thead>
<tr>
<th>Hierarchy Identifiers</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>syn</td>
<td>syntax</td>
</tr>
<tr>
<td>sem</td>
<td>semantics</td>
</tr>
<tr>
<td>mor</td>
<td>The level of fully inflected forms.</td>
</tr>
<tr>
<td>stem</td>
<td>The level of stems</td>
</tr>
<tr>
<td>base</td>
<td>The level of bases, intermediate between stems and roots.</td>
</tr>
<tr>
<td>root</td>
<td>The level of roots.</td>
</tr>
<tr>
<td>pref</td>
<td>The level of prefixes.</td>
</tr>
<tr>
<td>suff</td>
<td>The level of suffixes.</td>
</tr>
<tr>
<td>syll</td>
<td>The level of syllables.</td>
</tr>
</tbody>
</table>

Table 2.2: possible hierarchies
The extent to which the possible hierarchies are hierarchical will differ greatly. To investigate all of the hierarchy types constitutes a research programme of many years duration. Network Morphology is concerned with a detailed elaboration of the hierarchy labelled 'mor', which includes all the levels below it in the table, and with its interaction with the 'sem' and 'syn' levels of linguistic structure. In this thesis, however, we shall not make use of the identifiers 'base', 'pref', 'suff' or 'syl'.

2.4 Paths

Discussing examples (2.2) and (2.3), we hinted at an ordering of the attributes of a particular hierarchy. One of the key aims of Network Morphology is to seek to reflect general typological findings and principles. Certain of these principles involve claims about the relative importance of particular categories in relation to others. For example, the category of number may influence case choices, but case influencing number choice is much rarer. Indeed, in chapter one we mentioned Noyer's (1992) treatment of gender as a feature which is lower than number in terms of a universal hierarchy. This generalisation is achieved by ordering gender after number (and also case). We see in later chapters that this has far reaching consequences for nominal morphology in Russian. Linguists have discussed this kind of dependency in different ways. Hjelmslev (1943: 79/1961: 88-89), for example, uses the term 'dominance' and illustrates with an example from the Latin first declension, claiming that the neuter 'dominates' the 'overlapping', or syncretism, of the nominative and accusative. For our framework, this particular example turns out to be infelicitous, as we show that gender is not a category for nouns that appears in paths. This is because it is invariant for nouns. The Latin syncretism in question is associated with the inflectional class in question. Dividing the first declension in this way is unproblematic for an inheritance-based approach, such as ours. Indeed, this is what we do with classes I and IV for Russian. Another theoretician who has taken up this idea is Carstairs (1984) who talks of 'triggering feature' and changes this to 'contextual property' in later work (Carstairs-McCarthy 1992). Again, we would not accept certain of Carstairs (1984) examples, because they assume that noun inflection directly realises gender, whereas we claim that gender does not change for a given noun and is therefore not an inflectional feature. It should also be noted here that the

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4 This generalisation about number and case does not hold for all languages. Koryak has a singular, dual, plural distinction in the absolutive case, but no such distinction in the other cases for nouns with inanimate referents (Žukova 1972: 95 and 123). Johnston (1996: 200) also discusses this relation between case and number.
orderings of *features* outlined are not about the order of affixes per se. In principle, it would be possible for a case affix to occur inside of a number affix, for example, although we know that this is less common (Greenberg 1963: 95, Universal 39). The important question for linguistic typology as we see it is whether morphology realises particular distinctions for a category and what categories condition loss of distinction within another category. Our approach should therefore not be confused with hierarchies of functional categories put forward by, among others, Wunderlich and Fabri (1995: 246-247), where claims about the order of affixes are made.

At a more parochial level we may find reasons to claim that a particular *feature* is ordered before another *feature*. In motivating our claim about *hierarchy identifiers* we made appeal to a concept of inclusion that required an ordering of the *hierarchy identifier* before the *features* for number and case. The combination of the *hierarchy identifier* and these *features* is a *path*. A *path* in our terminology is an ordered *attribute* specification. Why is it important that we should claim that these specifications should be ordered, and what grounding does this have in linguistic reality?

Our first answer to this question has to do with the relationship between number and gender. Gender is neutralised throughout the plural in adjectives and the third person pronouns. So, for example, the endings 

- i, -m, -m' i, -x do not distinguish gender. We must therefore say that there is an ordering or dominance relation of number with regard to gender. Furthermore, as we shall see in chapter four (section 4.5), our approach claims that loss of gender distinction in the plural entails with it a greater likelihood of sharing plural morphology between nouns and adjectives.

The second answer to this question has to do with the relationship between case and number. There is an additional 'second locative' case in the singular for certain nouns. Also, certain nouns may have a partitive 'second genitive' case in the singular, as in (2.4).

(2.4)

Ja xoču čaj-u

I want tea-SG.GEN2

'I want some tea'

5 It is called the 'second locative' in order to distinguish it from the first or standard locative. We maintain the term second locative and distinguish it from the standard locative by using the other common term for the latter case, the 'prepositional'.

-49-
In contrast to the above, we never find an example in Russian where a particular number occurs only in a certain case. There is no example of a noun in Russian which has a genitive dual, or prepositional trial, but which only distinguishes singular and plural in the other cases. Logically, there is no reason why this should not be so. In fact, this can be considered an absolute for Russian.

Another important indication of the ordering relation between number and case in Russian can be found in singularia tantum and pluralia tantum nouns. We may talk of singularia tantum and pluralia tantum nouns, but never of genitive tantum or prepositional tantum etc. There are examples in which a particular case is problematic, but this is limited to a certain number. For example, the Russian noun lexeme MEČTA 'dream' has a problematic genitive plural ending according to Zaliznjak (1977: 213), and the sixteenth edition of Ožegov's dictionary (Švedova 1984) states that for the plural genitive mæťan 'iš is used. The point to note is that the singular genitive is fine. So in cases where we may find a gap in a paradigm restricted to a particular case, it will be restricted to a particular number as well. However, the reverse is not true. If we find a gap in a particular paradigm restricted to a particular number, it will not necessarily be restricted to a particular case. These are absolute facts about Russian. If we wish to take typology seriously, we must find a formal way of capturing such generalisations. Although we do not introduce a formalism in this chapter to deal with strong generalisations of this kind we shall carry our convention of ordering attributes further and claim that the order of attributes is important.

Connected with the above, but slightly different, is an example from the related West Slavonic language Polish, where certain nouns decline in the plural, but not the singular, such as muzeum 'museum' (Kotyczka 1980: 95 and 105-106; Tokarski 1993: 257). These nouns are in a sense partially indeclinable, but indicate that there is a stage between total indeclinability and having a full paradigm. So the evidence from partially indeclinable nouns in a related language to Russian is that inflectability is defined by number first (rather than case). So there should never be an occasion on which we may wish to say for Russian that the singular and plural are the same for a particular case, until we reach the stage where nouns and adjectives are totally indeclinable. The Polish example demonstrates that there is a possibility for a Slavonic language to have the same realisation of case within a given number, but there should be no example of a noun inflecting for number in a particular case only. This lends further support to our claim that number should be ordered higher than case.
A third reason why there should be an ordering imposed on attributes has to do with gender and case. The distinction between masculine and neuter is lost in the oblique cases of adjectives in the singular. Case therefore conditions loss of gender distinctions. For example, the ending -ovo is singular genitive for both masculine and neuter. In fact, masculine and neuter are not distinguished in any case other than the nominative.

Before we summarise our arguments for claiming that an ordering should be placed on grammatical categories we must be prepared to make a subtle distinction that others have not made. Carstairs (1984) talks about syncretism in terms of 'neutralised' and 'conditioning properties', or 'triggers'. In Latin nouns plural dative and ablative forms are identical.

"Dative and Ablative are thus the neutralised properties, and Plural is the conditioning one." (Carstairs 1984)

Likewise we might say for Russian that the prepositional and genitive cases are identical in the plural in adjectives and pronouns. We shall, in fact, argue that the Russian example of plural prepositional and plural genitive is not based on the ordering of features as such. This is because we need to capture the syncretism in the first and second person pronouns between the plural prepositional and the plural genitive. The plural genitive and plural prepositional of Russian adjectives is realised by the ending -ix. We might wish to claim that the syncretism results from the conditioning of loss of case distinction by plural number. If we do this, however, we cannot explain how forms such as nas 'we (plural genitive/plural prepositional)' or vas 'you (plural genitive/plural prepositional)' also fit the pattern of plural prepositional-plural genitive syncretism. In fact, there is a syncretism between the prepositional and genitive case in the singular, in nouns such as kost 'bone' (kosti is both singular prepositional and singular genitive). The difference between the syncretism in the singular and the syncretism in the plural is one of directionality. In the singular the prepositional follows the genitive, because there are other nouns which have the ending -i in the genitive, but not in the prepositional. In the plural the genitive follows the prepositional, because nouns have the same plural prepositional ending as adjectives, with only a difference in the theme vowel (nouns have -a-v as opposed to -i-x). Nouns therefore override the syncretism, but maintain the form used in the syncretism for one number and case combination. This therefore indicates that the syncretism is not based on the underspecification of a case triggered by plural number, but on some kind of 'take-over' of a number and case combination. Where the ordering of attributes is important here is that the higher ranking of number determines the directionality of the referral. Although we therefore make use of the
concepts of 'triggering' features in 'cumulative homonymies' (Carstairs-McCarthy 1992: 204), we also accept that there are types of syncretism which are asymmetrical, or which involve patterns which generalise across forms which are not identical (for example, the use of nas 'us' and novix 'new' as the plural genitive and plural prepositional). We have shown that there are clear straightforward examples where the ordering of features accounts for certain syncretisms, and we shall argue this to be true of case and gender in chapters four and five. In addition, we claim that there are syncretisms which are directional and which we argue should be accounted for by referrals. Furthermore, there is evidence that feature ordering and referrals are both required simultaneously to explain certain types of syncretism. For instance, we need a referral to account for the asymmetry of the syncretism between plural prepositional and plural genitive, and we need to order number before case in order to account for the fact that the asymmetry is conditioned by plural number (as the opposite asymmetry is found in the singular). It is precisely this detail of representation that is required when dealing with syncretism.

In (2.5) we summarise the main reasons for imposing an ordering or ranking on attributes.

(2.5)

(i) Certain categories condition syncretism for other categories, but not the other way round (e.g. number conditions case syncretism, but case does not condition number syncretism: plural conditions loss of gender distinction).

---

6We claim that, where gender and number occur together, the dependency of gender on number is universal. Possible counterexamples to this can be found in the Dravidian languages Kannada (Sridhar 1990: 244) and Tamil (Asher 1985: 144 and 173). In the future tense of Tamil verbs no distinction is made between singular and plural non-rational (Asher 1985: 173-174). Note that there is the category of tense to be taken into account here. In certain varieties of Tamil, singular and plural may not be distinguished in the third person neuter of the pronoun (Asher 1985: 144). In Kannada, verbs are less likely to mark the plural of third person neuter subjects (Shridhar 1990: 244), and in the varieties of Tamil which have no number distinction for the third person neuter pronoun there will be no number distinction for third person neuter on the verb (Asher 1985: 173). We argue that this is to be accounted for by the animacy hierarchy of Smith-Stark (1974), as both these languages have a strictly semantic gender assignment system (Asher 1985: 136-137; Sridhar 1990: 198; Corbett 1991: 8-11). The optionality of number marking is a function of the position of the nouns below the rationals on the animacy hierarchy.
(ii) Certain categories may be further partitioned in the presence of other categories, but not the other way round (e.g. number conditions partitioning of case, such as prepositional and genitive, but case does not condition partitioning of number).

(iii) Syncretism occurs throughout one category, but not another (e.g. case syncretism occurs throughout a particular number, but number syncretism not in a particular case). 7

Linguistic reality makes us claim that certain categories are ordered before others. When considering hierarchy identifiers we used the concept of 'inclusion' to motivate putting the hierarchy identifier first in an attribute combination, which we may now refer to as a path. It is important to note that any framework that does not have a means for imposing an ordering on attributes will not be able to capture the very strong generalisations that we have discussed. We may consider a path for the morphology of Russian nouns to have the ordering of figure 2.7.

![Figure 2.7: a path as an ordered attribute specification](image-url)

7 Indeclinable nouns fit into this generalisation in the sense that they represent conditioning of the loss of distinction of number and case by the morphological hierarchy identifier. It would be possible for an indeclinable noun to become inflected in the singular or plural only, but not only in a particular case. Hence, our approach makes predictions about degrees of inflectability.
Note that as we progress along a path the choice we make determines the possible features that may be chosen for a particular attribute type. Furthermore the order that we impose implies that the preceding attribute determines the choice for the following one. As we have argued with case and number, the number influences the possible choices for case, but case does not influence the possible choices for number. This exercise could be repeated for other areas of Russian grammar, such as the verbal system. Figure 2.7 does not show the ordering of gender relative to the other two categories. We claim that the path in figure 2.7 could be extended with a gender feature for adjectives, but the choice of gender is dependent on number, never the other way round, which we claim is a universal. Also, gender neutralisation may be conditioned by case, which is what happens in the oblique cases for the adjectives.

Certain categories are unordered with respect to one another. However, we make the strong claim that, if this is the case, the attributes should not be in the same path together, although they may occur in a fact at the same node. For instance, we may find that there is no reason founded in linguistic reality to claim that aspect is ordered before tense in a path. If this were to turn out to be correct, we would assume that they would not occur in the same path, although facts about tense and aspect would occur in parallel at the same node.

We are now also in a position to elaborate further on our understanding of facts. Facts are path: value pairings, and paths are ordered attribute specifications for which the ordering is important for making linguistic generalisations. The importance of this should also be noted for fusional languages such as Russian where is quite clear that the combination of a single inflection with a stem realises more than one feature at the same time. This is an additional advantage of seeing morphology as a feature interface, rather than a formative interface. One need not assume that morphology is always underlyingly concatenative, as appears to be the case in the work of Halle and Marantz (1993) and Noyer (1992) and structural approaches, such as those of Trager (1953). As can be inferred from this, the idea of a path is also grounded in linguistic reality.

2.5 Values

We noted that facts are path: value pairs and that paths are attribute specifications which consist of attributes in order of how specific they are. As paths may consist of more than one attribute, this allows us to capture facts about fusional languages where a particular formative may correspond to more than one attribute or feature, as is generally the case with Russian, where for example the ending -a in
stol-a indicates that the form is both singular and genitive and also that the noun belongs to either class I or class IV.

Values can differ along at least two dimensions. They are either sequential or non-sequential, and they may be atomic symbols or referrals (as Zwicky 1985) to other paths occurring on the left-hand side of another fact, either at the same node or at another node. Taking the two dimensions together we may have values that are non-sequential referrals (i.e. only one other path is referred to), values that are sequential referrals (i.e. the value is a concatenation of paths to be found elsewhere), non-sequential atomic symbols (i.e. the value is a single symbol, such as stol), sequential atomic symbols (i.e. the value is a combination of symbols). Furthermore, we may have combinations of these possibilities. For instance we will want to claim that the value corresponding to the path 'mor sg dat' for STOL is the concatenation of the stem stol and the ending -u, the first being a reference to the path that contains one attribute, namely 'stem', the second being an atomic symbol.

Just as we saw that paths were complex specifications of ordered attributes, so we see that values are also complex specifications with an order imposed on them. For morphology the linguistic reality which is reflected by the order of our theory is of course the physical order in which the forms of a language appear. For Russian this means that stems occur before the affixes which realise inflectional categories.

2.6 Conclusion

In this chapter we have given a general introduction to Network Morphology. We claim that it is a realisational theoretical framework. One of the organisational principles that distinguish it from other frameworks of morphology is that it accepts the status of the lexeme as a valid theoretical construct combining syntactic, semantic and form information. Furthermore, lexemes are ordered in terms of a hierarchy which provides information by default and expresses facts about them in a non-redundant manner. There is also a morphological hierarchy which, for Russian at least, combines stems and affixes to provide the fully inflected forms of the language. The treatment of these two hierarchies as different but interrelated is innovative, because it allows for fine grained distinctions about how these two areas of knowledge are related, without forcing us to claim that they are completely split.

Finally, we have also claimed that a rigorous theoretical framework should be able to reflect certain important aspects of linguistic reality, either that which holds parochially or universally. For example, we have demonstrated that, for Russian at least, number includes case, but case does not necessarily include number. This means that we should adopt a framework that imposes an order on attributes. We
also make the strong claim that where attributes cannot, or should not, be ordered in relation to one another, then they should not occur in the same path. It now remains for us to show in the next chapter how these general principles of our framework are translated into a formal representation in the DATR language.
CHAPTER THREE

Representation in DATR

3.0 Introduction

In chapter one we pointed out why morphology could be seen as a separate module in its own right, and in chapter two we outlined some of the basic programmatic assumptions of Network Morphology. These included, among other things, the assumption of a lexeme-based approach, the use of default inheritance to capture sharing between inflectional classes, the differentiation of the network of morphological knowledge from the hierarchies which constitute part of that network, and the ordering of attributes to capture typological generalisations. In this chapter we show how our diagrammatic representations of Network Morphology correspond to formal representations using the DATR language.

3.1 Why DATR?

Network Morphology is a formal framework which is independent of formalism. It has been developed and inspired by using the DATR formalism to represent morphological knowledge, but the principles of Network Morphology outlined in the next chapter could be couched in terms of other formal representations. It is possible that, in what is known as theoretical linguistics, theorising may often involve discussion of the computational properties of a formalism that has been developed by the theoretician. For example, within the Minimalist Morphology framework of Wunderlich (1995: 262) the Redundancy Principle is connected with making the computation of morphology deterministic. In order for this to work the claim must be maintained that morphology cannot add information that is already present. As an example, consider the treatment of the second person (singular) ending for the verb in German, given in (3.1) (originally Wunderlich and Fabri's example (26b)).

(3.1)

\[
\begin{array}{l}
\text{PHON} \\
\text{exponent} \\
\text{SUBCAT} \\
\text{CAT} \\
\end{array}
\]

\[
\begin{array}{c}
\text{PHON} \\
\text{exponent} \\
\text{SUBCAT} \\
\text{CAT} \\
\end{array}
\]

\[
\begin{array}{c}
\text{PHON} \\
\text{exponent} \\
\text{SUBCAT} \\
\text{CAT} \\
\end{array}
\]

\[
\begin{array}{c}
\text{PHON} \\
\text{exponent} \\
\text{SUBCAT} \\
\text{CAT} \\
\end{array}
\]

\[
\begin{array}{c}
\text{PHON} \\
\text{exponent} \\
\text{SUBCAT} \\
\text{CAT} \\
\end{array}
\]

The [+min] diacritic indicates that the affix is bound, but this need not concern us here. The important point is that the affix subcategorises for a verb (stem) and yields a verb marked for second person as the output. As Wunderlich and Fabri (1995: 262) point out, the input information is redundant, because only verbs may be marked for
second person. The important point, however, is a formal one. Consider a version of (3.1) rewritten as (3.2), which would be ruled out by the Redundancy Principle.

\[(3.2)\]

\[
\begin{array}{c|c|c}
\text{PHON} & \text{SUBCAT} & \text{CAT} \\
\hline
\text{exponent} & \text{input} & \text{output} \\
\end{array}
\]

\text{/st/; \([\text{min}+]\); \([+2] \rightarrow [+2]\)}

(3.2) would lead to non-determinism. It would allow for possible infinite recursive affixation of the affix /st/. Wunderlich and Fabri (1995: 263) state that the Redundancy Principle entails that "inflectional morphology is monotonic in terms of categories." What this appears to mean is that it should not be possible to keep adding information about the same category. If examples such (3.2) were not ruled out, there would be more than one possible form of the second person, for example. In fact, the number of possible forms is infinite, as the computation of the second person form need never terminate. Note also that increasing the output information of the affixation would still not rule out the rule reapplying, as the affix would still contain an input requirement that could subcategorise for the output. It appears that the Redundancy Principle is actually required because of the affix-based approach that is taken to morphology in Wunderlich and Fabri's framework. Hence, this principle itself is the product of assuming that morphology is affixation-based and deterministic. The problem is that it is conflated with another assumption about extended exponence, namely that it cannot exist (because of the underlying concept of affix), and indeed this principle is interpreted as essentially making predictions about extended exponence. Yet whether morphology is deterministic, and whether there is extended exponence are two separate issues. It makes sense that morphological computation is deterministic, but we have already given a Russian example of extended exponence in section 1.2, which indicates that it is possible. Other examples of extended exponence can be found (see, for example, Stump 1990).

In the example above, the linguistic theorising being carried out is about the computations underlying morphological realisation. This type of theorising is usually considered to be separate from computational linguistics, even though it is about computation. The Network Morphology enterprise, on the other hand, assumes that it is in part the role of the computational linguist to develop well-defined formalisms which can be interpreted by a computer so that theoretical linguists, namely typologists, can get on with theorising about the structure and mathematical properties of language, rather than trying to understand the structure and
mathematical properties of the "formalism" they have developed. Under this view theoretical linguistics and computational linguistics are complementary.

DATR is a Turing-equivalent formalism (Moser 1992) and in principle anything that is computable can be modelled using it. The Network Morphology framework and the principles and constraints we outline in chapter four obviously place limits on the type of structures which can be represented. As we have mentioned, DATR is squarely based on default inheritance, which makes it ideal for representing the exceptionality that we find in natural language morphology. It also allows for orthogonal multiple inheritance (Touretzky 1986) by being path-based.1 Where this ties in with linguistic typology is in the study of the relation between categories, such as number, case and gender. Being path-based, DATR allows us to make statements about the relations between the attributes in a path. in particular whether the features of a particular set may condition the presence or absence of the features of another set. For instance, whether particular number features may condition the presence or absence of particular case features. We have already discussed this in section 2.4.

3.2 Nodes represented in DATR

In figure 2.4 in chapter two we gave a simple lexemic hierarchy in which the lexemes STOL, RUKA, KOST' and OKNO were connected to the NOUN node. If we consider the lexeme STOL, also a node, the DATR formalism requires that it must start with an upper case character (Evans and Gazdar 1996: 169 fn4).

(3.3)

\[
\text{Stol:} \\
<\text{root}> == \text{stol}.
\]

In (3.3) we have not fully capitalised the representation of the lexeme STOL, as it is a Network Morphology convention to write lexical entry names in lower case after the initial capital (Corbett and Fraser 1993). The node is also required to have at least

1We have to be careful about our use of path in this context, as paths are usually interpreted as a sequence of links between nodes in standard approaches to inheritance. A DATR-path need not, of course, involve any link with another node.
one fact (here one that gives information about the root) and be completed by a full stop. Nodes are locations where an indefinite number of facts may be placed.2

### 3.3 Facts represented in DATR

In this section we outline some of the types of fact which are to be found in DATR representations of Network Morphology theories. The facts of a theory represented in DATR are essentially a pairing for a given node of a left-hand and a right-hand side separated by the double equals operator '=='. When a theory is evaluated to see which forms can be inferred from it, the evaluated theorems involve a pairing of a left-hand side which is a path and a right-hand side which is a combination of atomic symbols. For an evaluated theory the left-hand side and the right-hand side are separated by the single equals operator '='. The examples we give contain the double equals operator '==' to indicate that this is the unevaluated theory.

We now go on to outline the different types of fact which may be found in DATR theories.

*Type 1: the pairing of a path with an atomic value*

We need to state some information about STOL in the form of a DATR equation, which represents one of the Network Morphology facts we discussed in section 2.2.

(3.4) Stol:
\[ <\text{root}> == \text{stol}. \]

(3.4) is now a perfectly valid DATR fragment. We could query it for values for the path \(<\text{root}>\) and its extensions. We deal with DATR paths and extensions in section 3.5. Note that in the DATR syntax paths are enclosed within angle brackets. Therefore any combination of symbols within \(<\ldots>\) is a path. Currently (3.4) is not

---

2To say this is actually to conflate two separate notions, one being that of node, the other being that of node definition. Formal definitions of the semantics of DATR state that nodes belong to a set of symbols (e.g. Keller 1996). In other words, nodes are primitives which cannot be further defined. One important part of Network Morphology is to determine which facts may be placed at which nodes. What this strictly means is determining which type of node definitions are allowed in the presence of other node definitions. We continue to maintain this ambiguity in our exposition, as the metaphor of nodes as locations is useful to gain an informal understanding.
a valid Network Morphology theory, as it contravenes one of the principles we outline in chapter four, namely Integrity³.

Type 2: the pairing of a path with a node

Figure 2.4 has the lexeme STOL inheriting from the node NOUN. How is this represented?

(3.5)

Stol:
<> == NOUN
<root> == stol.

The empty angle brackets (empty path) in the first equation with the name of the node NOUN on the right-hand side indicate that the node Stol will inherit all information not specified by itself from the node NOUN. This is the way that hierarchy relations can be represented in DATR. It should be noted that the empty path in DATR has no privileged formal status (Evans and Gazdar 1996: 172). However, a special status is attributed to it for the representation of Network Morphology theories, precisely because it is used to represent hierarchy relations. At the node NOUN we can also specify the information that is given in the simple diagram in figure 2.4, represented in DATR as in (3.6).

(3.6)

NOUN:
<> == WORD
<syn cat> == noun.

As in figure 2.4, the node NOUN inherits by default from the node WORD and specifies that it assigns the syntactic category noun. In examples (3.4), (3.5) and (3.6) we have seen facts that either pair a path with a value or pair a path with a value at another node (in this case a hierarchy relation). It is also possible to pair paths with paths at the same node.

Note that (3.4) and the information about syntactic category in (3.6) are the only examples we have seen so far of a direct pairing of a path with a value: other facts involve either reference of one path to another, either at the same node, or at another node. We have not given any examples of the former, but have an example of

³As we shall see in the next chapter, this principle places a limit on exceptionality. Its name might lead one to confuse it with the principle of Lexical Integrity of Lexical Functional Grammar (as Bresnan and Mchombo 1995), but they are not at all similar.
the latter. The hierarchy relations in both (3.5) and (3.6) involve reference to the empty path at the 'higher' nodes referred to. In (3.5) the empty path refers to the empty path at the 'higher' node NOUN, because (3.5) is equivalent to (3.7), as there is a DATR convention that states that you do not need to repeat a reference to a path paired with a referenced node, if it is identical with the path which refers to it.

(3.7)
\[
\text{Stol:} \\
<> == \text{NOUN:} <> \\
<\text{root}> == \text{stol.}
\]

In (3.7) the hierarchy relation is a reference to the empty path at the node NOUN.

Understanding default inference (Evans and Gazdar 1996: 185-186) is a key to understanding what referring to another path involves. Not only is the value associated with the empty path at NOUN inheritable by (3.7), but also any path which extends the empty path, this means that Stol will inherit anything from NOUN which extends this path. That means, in fact, everything not specified by Stol itself. The hierarchy relation is therefore a special kind of fact that involves two things: reference to another node; reference to the empty path at that node (and therefore by default all paths, unless otherwise specified). Network relations, which we discussed in 2.1, also involve path-node pairings. If we consider the node STOL in figure 2.6, we may represent its network relation with the node N_1 as in (3.8), where the DATR convention means that the left-hand path refers to the identical path at N_1.

(3.8)
\[
\text{Stol:} \\
<> == \text{NOUN} \\
<\text{mor}> == \text{N}_1 \\
<\text{root}> == \text{stol.} \quad \text{[Network Relation]}
\]

In the next section we go on to consider path-node pairings, which come under the general heading of relations, in greater detail. Our next step is to consider the path-path pairings, which are basically the way of representing referrals (Zwicky 1985) using DATR.

Type 3: the pairing of a path with a path

By path: path pairings we mean that one path refers to another for its value. As mentioned, path: node pairings are also really a kind of path: path pairing, as one cannot refer to another node without making reference to a particular path at that node. The path: path pairings in question do not specify another node. Let us
consider how we might represent the fact that the lexeme STOL realises its singular nominative by means of the root only. As we know, this is in fact because the lexeme STOL belongs to the first declension, but we shall treat this as though it were a lexical idiosyncrasy for the purposes of illustration.

(3.9)

Stol:
<> == NOUN
<mor sg nom> == <root>
=root> == stol.

In (3.9) it is stated that the singular nominative value is obtained by referring to the root, and the value for root of the lexical item Stol is 'stol'. In example (3.8) we saw that the lexical item Stol had a network relation with the node N-I. Here, we have offered an alternative node Stol without that relation. In fact, we would have to specify each of the realisations for Stol, if there were no class N-I, as we argued in section 2.1. The path: path pairings that appear throughout this thesis are not usually of this straightforward local kind, where a path is paired with another path at the same node. Nor are they of the path: node kind we have seen earlier, where a path at one node refers to a path at another specifically named node (as is the case in (3.8) where the network relation stated for Stol refers to the path <mor> at the node N-I).

There are path: path pairings which do not name a particular node, but which involve more than just reference to another path at the same node. In the DATR formalism the right-hand path is enclosed within quotes. These are referred to in the DATR literature in terms of 'global inheritance'. We now go on to explain what these correspond to in Network Morphology theories.

Type 4: the pairing of a path with a global "path"

In figure 2.3 the realisation of a particular number and case combination is a combination of an X, which is the stem or root, together with an ending. This X will be instantiated according to the particular lexical item in question. With the path: path or path: node pairings we have already seen, a particular node is referred to for the value of a path. For the former pairing, it is the node at which the pairing is given, for the latter it is the node which is referred to. However, what we require is to be able to refer to a path for which the paired value will depend on the particular lexical item in question. If we consider the lexeme RUKA 'hand', we would wish to state that it belongs to the second declension, and that all second declension nouns realise the singular nominative by concatenating the stem with an ending -a. However, the stem will depend on the particular lexical item in question, not just RUKA. In order to capture this the path referred to is quoted, as illustrated by (3.10).
Nouns such as RUKA would then refer to the node N_II, but quoting the "<stem>" path means that the atomic value which is ultimately concatenated with the ending will depend on the lexical item which is being queried. These quotes can be considered "indirection" markers, and are an indirect reference to the particular value specified for that path at a lexical entry. The use of quoted paths is what is called 'global inheritance' in the DATR literature. We shall refer to quoted paths as indirection markers in other parts of this thesis, or use the term 'global inheritance'.

A final point to make in this section, and one that is exemplified by (3.10) is that the term 'pairing' may be slightly misleading. In principle the right-hand side of the pairing may be complex in that it combines reference to an indefinite number of paths or nodes and atomic symbols, combined in any way. Example (3.10) combines a reference to a quoted path with an atomic symbol.

### 3.4 Attributes represented in DATR

In the previous section we have made reference to the concept of paths in DATR without going into detail about what they look like within the formalism. Paths are in fact ordered attribute specifications. The choice of attributes is, of course, totally independent of the DATR formalism. The ordering requirements that we highlighted in the previous chapter (section 2.4) are ones made by the Network Morphology framework, but the ordering of the attributes in this way is a fundamental property of standard DATR. The singular accusative realisation of class II nouns could be represented in the following way at the node N_II (3.11).

(3.11)

<table>
<thead>
<tr>
<th>N_II:</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;mor sg acc&gt; == &quot;&lt;stem&gt;&quot; _u</td>
</tr>
<tr>
<td>...</td>
</tr>
</tbody>
</table>

Enclosed within the angle brackets on the left-hand side is a path. This path contains attributes defined by the Network Morphology framework. First, it is assumed that there is a level of morphological linguistic structure, picked out by the hierarchy identifier mor. Second, it is possible to specify this structure further for Russian and other languages by adding a number feature, in this case sg. Finally, adding information about case, here the accusative, completes the left-hand side paths in facts about nouns (in this case, class II nouns). All theories represented in DATR
contain the double equals operator between the left-hand side and right-hand side (only evaluated theories contain single equals signs in the derived theorems). After the double equals we see that another attribute in a path is globally referred to, namely the level of stems, as represented by the stem attribute in the path on the right-hand side. Again, the choice of these attributes is totally independent of the DATR formalism.

3.5 Paths represented in DATR

In the previous section we saw that the choice of attributes required for use within the Network Morphology framework is independent of the DATR formalism. We also saw how the ordering of attributes within a DATR path, a property of DATR, is made use of by Network Morphology to capture category dependencies. In example (3.11) the realisation of number depends on the level of morphological structure (i.e. whether morphology permits the formal realisation of number), then the realisation of case is dependent on number. In the previous chapter in section 2.4 we argued for this dependency on the basis of the exceptional cases, the second locative and second genitive, which only occur in the singular. In this thesis we shall show how this ordering requirement on number and case allows for a neat account of the second locative case, which we shall argue itself also involves further specification of case as a combination of features.

Throughout the thesis we shall refer to the concept of extension, where one path extends another. In (3.12) the path (b) is an extension of (a). The path (c) is an extension of (b), and therefore also of (a). The path (d) extends (c), and therefore also (b) and (a). The path (e) is an extension of (d), and therefore also of (c), (b) and (a). An alternative way of putting this is that (a) subsumes (b), (c), (d) and (e), that (b) subsumes (c), (d) and (e), and so on.

(3.12)

a. <>
b. <mor>
c. <mor sg>
d. <mor sg nom>
e. <mor sg nom fem>

Subsumption (or its converse extension) involves a relationship between (partial) feature descriptions. In order to distinguish between (possibly) partial feature descriptions and the complete feature structures of which they are a description, we may use attribute or feature specification for the former, and feature structure for the
latter. Of course, Network Morphology distinguishes different feature structures depending on word class. For example, in (3.12) (d) is a complete feature structure for nouns, but could only be a feature specification for adjectives, whereas (e) is an acceptable feature structure for adjectives, but neither an acceptable feature specification or feature structure for nouns. It follows, of course, that if a given combination is an unacceptable feature structure for a particular word class, then it cannot be an acceptable feature specification for that class. DATR's rule of default inference (Evans and Gazdar 1996: 185-186) will always mean that the value for any feature structure for a given node can be inferred on the basis of the most specific feature specification, stipulated for or inherited by that node, of which the feature structure in question is an extension. This is known in DATR terms as the "longest-defined-subpath-wins principle" (Evans and Gazdar 1995: 20). More concretely, if a node inherits a fact which gives a value for the feature specification (3.12 b), and we wish to know what the value of (3.12 d) is for that node, then it will be the value paired with (3.12 b), unless the node also inherits or stipulates another fact for which the left-hand side is an extension of (3.12 b) and of which (3.12 d) is an extension. For instance, if the pairing which had (3.12 c) on its left-hand side were inherited by the node in question, then this would win for the realisation of the feature structure (3.12 d).

We shall outline in chapter 4 certain Network Morphology principles which make use of the concept of extension, specifically the Overextended Ancestor Prohibition and the Intrahierarchy Network Relations Principle (Subprinciple of Information Maintenance). These principles will not be outlined here, as they are explained in the next chapter. What is important is for us to have an understanding of what path extension means. There are at least three ways in which the concept of

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1 In practice this means that we can consider the queries which are declared for a given word class as feature structures, and the paths of a theory as attribute specifications. There are different notions of feature structure (see Carpenter 1992: 35). Pollard and Sag (1994: 21) point out that feature structures can be partial descriptions of other feature structures (the subsumption relation in Pollard and Sag 1987, for example). In Pollard and Sag (1994: 21) AVMs (Attribute Value Matrices) are used as the descriptions of feature structures, where the latter are required to be "totally well-typed, sort-resolved features structures" (Pollard and Sag 1994: 21). It is the feature structures themselves which are models of linguistic entities.

2 This term appears to have been omitted from Evans and Gazdar (1996: 203), the later version of Evans and Gazdar (1995), but we use it here, because it neatly summarises what is going on.
extension applies in our discussion of representation. First, we can use it to talk about two paths which both occur on the left-hand side of facts at the same node. The most obvious and ubiquitous example of this is where the empty path is extended by other paths at the same node. This will be true of any node that is part of a morphological hierarchy. Second, we can use it again to talk about the left-hand sides of facts which are at different nodes, but where these nodes are in hierarchy relations or network relations. One of the principles outlined in the next chapter prohibits the existence of extensions of paths at a higher node, with the crucial exception of extensions of the empty path, this principle is called the Overextended Ancestor Prohibition.

Another important way we may discuss extensions is with regard to facts which are either path : path pairings, path : "path" pairings, or path : node pairings. An important point to note is how the rule of default inference applies to such pairings. We can illustrate this with an example from Welsh Romany, where the imperfect tense is the same as the present tense with the addition of a final _s. This is captured by referral of the imperfect to the present as in (3.13).  

(3.13)

CONJ:

```
<present> == "<stem>" _ena
<present 1st sg> == "<stem>" _ava
<present 2nd sg> == "<stem>" _esa
<present 3rd sg> == "<stem>" _ela
<present 1st pl> == "<stem>" _asa
<imperfect> == <present> _s
```

Example (3.13) may be used to illustrate the way that default extension interacts with path : path pairings. Of course, the fact in (3.13) which states the realisation of the

6These data are from Stump (1993 b) who cites Sampson (1926) as his source (see also Booij 1993:35). On the basis of these data Stump argues that referrals are not always appropriate. He claims that the identity of second and third person plural in the present and imperfect should not be accounted for by a referral (Stump 1993 b: 451). The representation in (3.13) is in accordance with this claim. The referral of the imperfect to the present in (3.13) is one possible way of representing the generalisation that the imperfect is the same as the present plus the ending -s. However, in (3.13) the realisation of the second person plural and third person plural is nowhere explicitly stated, and this is in accord with Stump's (1993 b : 451) claim that -ena suffixation applies by default, although he has it as a default for the plural. So the referral which we posit here, while it may be the case that a Paradigm Function Morphology approach would not analyse the data in the same way, is not the referral which Stump (1993 b : 451) argues against.
imperfect is more than just a *path : path* pairing, as the symbols _ and s are also used, but this is irrelevant for our purposes. Importantly, the pairing means that any *extension* of the path <present> will be an *extension* of the path <imperfect> in the absence of any explicit statement to the contrary (see Evans and Gazdar 1989 a). This means that we can derive from (3.13) the following theorems for the imperfect of a verb in (3.14), as well as the more obvious theorems regarding the present tense.

(3.14)

\[
\text{Kam:}
\]

\[
\begin{align*}
<gloss> &= \text{to\_love} \\
<\text{imperfect 1st sg}> &= \text{kam \_ava \_s} \\
<\text{imperfect 2nd sg}> &= \text{kam \_esa \_s} \\
<\text{imperfect 3rd sg}> &= \text{kam \_ela \_s} \\
<\text{imperfect 1st pl}> &= \text{kam \_asa \_s} \\
<\text{imperfect 2nd pl}> &= \text{kam \_ena \_s} \\
<\text{imperfect 3rd pl}> &= \text{kam \_ena \_s}
\end{align*}
\]

With *path : "path"* pairings the effect is obviously similar to that with *path: path* pairings. In later chapters we shall see that one *fact* true of at least class II and class III nouns is that the singular prepositional is the same as the singular dative. As we shall argue, this can be taken to be a *default*. For the purposes of illustration we use this *fact* here to illustrate in (3.15).

(3.15)

\[
\begin{align*}
\text{MOR\_NOUN} \\
<\text{<>} &= \text{MOR\_NOMINAL} \\
<\text{mor sg dat}> &= \"<\text{mor sg prep}>\"
\end{align*}
\]

For nouns the *feature specification* on the left-hand side also happens to be a *feature structure*. However, as it turns out, this *fact* interacts in an interesting way with other parts of nominal morphology, as we shall see later in chapters five and six. We shall argue that for adjectives there is a specific reference to noun morphology for the realisation of the singular dative feminine. As we shall see later, this is in accordance with a particular principle of Network Morphology, which has the effect that adjectives can refer to nouns for their morphology but not the other way round. This reference to noun morphology is even more interesting, because it does not get the same form, but the same syncretism. How can adjectives refer to nouns for a realisation of a morphological *feature structure* which is an *extension* of the *feature structures* allowable for nouns? The answer is precisely because the *feature structure* is an *extension*. Noun morphology subsumes adjectival morphology. We give the reference to noun morphology in (3.16).

(3.16)
The fact given in (3.16) would not be allowable on its own, and there is a great deal of information about adjectives which has been left out and is indicated by ellipses. As we have seen the path <mor sg dat fem> makes reference to the same path at the node MOR_NOUN. Because gender is not part of noun feature structures, the next specific path is <mor sg dat> at MOR_NOUN. This path refers to the path "<mor sg prep>", enclosed in indirection markers for its realisation. Recall that any extension of the left-hand path will also be an extension of the right-hand path. This means that the singular dative feminine of adjectives (by reference to the singular dative of nouns) will be the same as the singular prepositional feminine. Because the path at MOR_NOUN is enclosed in indirection markers, this means the value for the singular prepositional feminine will be the value inherited by the particular lexical item in question, an adjective, rather than the one specified at the node for nouns. All of the above illustrates that we can use path extension to model some quite abstract patternings.

### 3.6 Values represented in DATR

The values of morphology are the realisations in form paired with particular morphosyntactic feature combinations. As mentioned, it is possible for an indefinite number of path or atomic symbol combinations to appear on the right-hand side of a fact. In order to indicate whether the particular sound combinations should be treated as simultaneous or concatenated, we shall make use of a couple of operators, following loosely the work of Gibbon (1992). These are the concatenation and overlap operators: 'A' and "" in (3.17). This symbol is not integral to the DATR formalism, but is used here for representational purposes. If we consider a noun like STOL, we see that the realisation of the singular genitive is a concatenation of the stem and the ending -a, which is realised in overlap with word stress (here given as double quotes), indicated by the overlap operator "".

(3.17)

\[ \text{Stol:} \]
\[ <\text{mor sg gen}> = \text{stol} ^ \cdot \text{a} ^ " \].

As we have already seen in terms of specification, the facts may have further feature specifications as values or atomic symbols. Obviously, a fully elaborated theory of morphotactics would limit the possible combinations, but the DATR formalism allows for any number of combinations.
3.7 Hierarchy and Network Relations

In the previous chapter, more specifically in section 2.1, we considered two different types of relations which are part of the Network Morphology framework. The first is the hierarchy relation which is a link between a subclass of items and a superclass. This is, strictly speaking, not a subset relation, as the 'lower' node may override information from the higher, something which is constrained by a principle we introduce in the next chapter. As mentioned in 3.3, we saw how hierarchy relations are a particular kind of fact of the path: node type. Note that the hierarchy relation in (3.7) corresponds to the diagrammatic hierarchy relation between STOL and NOUN in figure 2.6 of the previous chapter. The dashed line between STOL and N_1 in figure 2.6 corresponds to the network relation indicated for example (3.8). As network relations are defined for a particular more specific level of information, they must contain at least a hierarchy identifier in their left-hand path, for example (3.8) it is the hierarchy identifier mor. On the other hand, hierarchy relations do not name a specific level of linguistic structure or any more specific information than that. This means that any information can be inherited from, say, node A, if node B inherits from it via a hierarchy relation.

Where the term mother or daughter is used in the Network Morphology framework it is a further refinement of the hierarchy relation, which means that mother and daughter have a special meaning within the Network Morphology framework. One of the properties of hierarchy relations is that they are transitive.

(3.18)

Transitivity of hierarchy relations

If node A is in a hierarchy relation with node B, and node B is in a hierarchy relation with node C, then node A is in a hierarchy relation with node C.

This follows in the DATR representation in that node A will inherit from B all values for the path <> and its extensions, unless otherwise specified, and B will inherit from C all values for the path <> and its extensions, unless already specified. Because of the default nature of the representation, to reflect the morphological reality, one cannot say that a fact stipulated at C will necessarily be inherited by A, as it may be

7 Work within fuzzy set theory does actually appear to accommodate this kind of concept within subsethood. A subset is defined in terms of the degree to which it is a member of a superset (see (Kosko 1994: 60) for an introduction to this way of thinking).
overridden by A, or by B. In virtue of (3.18) hierarchy relations may obtain between a node and any number of nodes 'higher' in the hierarchy. In contrast to this, the mother-daughter relation is local and not transitive. This is defined in (3.19).

(3.19)

Definition of Mother-Daughter Relation

If node A is in a hierarchy relation with node B, and there is no node C which is also in a hierarchy relation with node B and with which node A is in a hierarchy relation, then B is the mother of A, and A is the daughter of B.

The relations between nodes that we have discussed here are special kinds of facts. One important point to bear in mind in terms of our use of DATR to implement Network Morphology theories is that a special status is attributed to the 'empty' path which it does not have within the DATR formalism. This special status is that of hierarchy relation.

It is worth considering here briefly what it means for a hierarchy relation to exist between two nodes. In chapter two we saw that there were at least two hierarchies, a lexemic and a morphological hierarchy, and that there was not necessarily a 'top' node, as is often assumed for a number of inheritance-based approaches. Consider first the lexemic hierarchy with reference to example (3.5), which we repeat here as example (3.20).

(3.20)

\[\text{Stol: } \langle > \rightarrow \text{NOUN} \]
\[\langle \text{root} \rangle \rightarrow \text{stol}.\]

Here the 'empty' path is used to represent the hierarchy relation between the lexeme STOL and the node which generalises over noun lexemes, NOUN. As stated in section 2.3 hierarchy identifiers come first in a path. As the lexemic hierarchy combines different levels of linguistic structure, this means that one path at a node in the lexemic hierarchy may differ from another at the same node in terms of its hierarchy identifier. The use of the 'empty' path as hierarchy relation means that all levels of linguistic structure are inherited by the node for the lexeme STOL. If we were to replace the 'empty' path with a path: node pairing which made reference to a particular hierarchy identifier, then STOL would fail to inherit facts which contained paths beginning with other hierarchy identifiers. If we considered (3.21), for
example, the lexeme STOL would inherit no information other than that about its syntactic properties.

(3.21)

\[
\text{Stol:} \\
\quad \langle \text{syn} \rangle = \text{NOUN} \\
\quad \langle \text{root} \rangle = \text{stol.}
\]

In (3.21) it makes a big difference whether or not the path is empty. If we consider the morphological hierarchy we introduce in section 2.1, on the other hand, it need not make any difference if we have the 'empty' path or a path which contains only a hierarchy identifier \( \text{mor} \). This is because all other hierarchies apart from the lexemic hierarchy must contain paths which begin with one particular hierarchy identifier. Consider (3.22).

(3.22)

\[
\text{N-I:} \\
\quad \langle \text{mor} \rangle = \text{MOR-NOUN} \\
\quad \langle \text{mor pl gen} \rangle = "\text{stem}" \_ \text{ov}
\]

In (3.22) the first path contains only the hierarchy identifier \( \text{mor} \). Note that the effect of this is to say that N-I will inherit all of the extensions of the path \( \langle \text{mor} \rangle \) from MOR-NOUN, unless this is stipulated otherwise. As we require that all paths in this hierarchy begin with the same hierarchy identifier we can be sure that N-I will inherit all the facts stated at MOR-NOUN, if they are not specified at N-I itself. For this hierarchy, therefore, there appears to be no functional difference between the empty path and the path containing solely the hierarchy identifier when the hierarchy is not the lexemic hierarchy. As we have claimed that there is an important difference between hierarchy and network relations, we give a more precise definition of hierarchy relation in (3.23).

(3.23)

A fact equating a path at node A with an identical path at node B is a hierarchy relation, iff

(i) all other left-hand paths at node B are extensions of the path in question

and

(ii) all other left-hand paths at node A are extensions of the path in question.
We can say that any path: node pairing which does not meet the definition in (3.23) defines a network relation. The definition in (3.23) allows us exactly the intuitive understanding of hierarchy relation we elaborated in the previous chapter. The example in (3.22) above is no longer problematic. It can be seen that (3.22) is a hierarchy relation, because all left-hand paths at N-I are extensions of <mor> and all left-hand paths at MOR_NOUN will also be extensions of <mor>. Throughout the rest of this thesis we shall use the 'empty' path to represent hierarchy relations, as its use makes no difference to examples such as (3.22). Note also that (ii) means that no lexeme such as STOL could be defined as being in a hierarchy relation with the node N_I, because there are other paths at that node which are not extensions of the path <mor>. Consider (3.24).

(3.24)
\begin{verbatim}
Stol:
<> == NOUN
<mor> == N_I
<root> == stol.
\end{verbatim}

It is the case that all left-hand paths at N-I are extensions of the path <mor>, however (3.23 ii) is not satisfied, because there are other paths at Stol which are not extensions of the path <mor>, namely the 'empty' path and the path <root>. This also yields a more subtle understanding of hierarchy. The lexical entry for the lexeme STOL is not in a hierarchy relation with N_I, because it has a hierarchy relation with NOUN.

As stated, we shall use the 'empty' path to represent the hierarchy relation, but it should be borne in mind that a more sophisticated definition underlies this. In chapter four we shall attribute a special status to the hierarchy relation with regard to some of the principles that we introduce, in particular the Overextended Ancestor Prohibition.

3.8 Conclusion

In this chapter we have tried to motivate our choice of DATR for representing Network Morphology theories. In particular we argued that it is ideally suited for dealing with default inheritance. We then went on to consider the representation of different types of facts within Network Morphology. In particular we explained how the Network Morphology concepts of hierarchy relation and network relation can be represented in DATR. Hierarchy relations can be understood in terms of the definition given in (3.23). There is no special formal status within DATR for the 'empty' path used to represent hierarchy relations, but there is within Network Morphology. In the next chapter we shall outline some substantive constraints of the...
Network Morphology framework and then go on to demonstrate what kind of predictions they make regarding the nominal morphology of Russian. In particular, we shall show in chapters five and six that the framework allows for two different theories of Russian nominal morphology and that there is a relationship between the choice of certain defaults for nominals and the existence of particular morphological classes. This then leads us to show how the marginal second locative fits into the more general system.
CHAPTER FOUR

Network Morphology Principles

4.0 Introduction

In chapter two the Network Morphology framework was introduced and a number of the general principles explained. In the previous chapter we introduced the DATR formalism and how it could be used to represent Network Morphology theories. Here we outline a number of principles that we apply in the configuration of hierarchies of Russian nominal morphology in chapters five and six. We then show in chapters seven and eight how we can incorporate the greater exceptionality of the so-called second locative.

In sections 4.1 to 4.8 we present a number of principles of the framework which determine what are acceptable hierarchies. Section 4.9 then introduces certain heuristics which we use to determine the configuration of possible hierarchies. These heuristics do not constitute hard and fast principles of the framework.

In dealing with the nominal morphology of Russian we shall take account of noun, adjective and pronoun declensions. In addition to the general principles, we shall make a number of stipulations which limit the choices of representation available. The beneficial consequence of this is that the means to circumvent our principles is reduced, if certain of them prove problematic. First, we make a common-sense stipulation about nominal categories.

(4.1)
If the realisation of a particular feature specification is the same for more than one of the nominal classes (nodes in the hierarchy), then there is phonological identity in the realisation, and the shared ending cannot appear more than once in the hierarchy. ¹

¹This is not a tautology. There is a difference between two sounds being the same sound and two sounds being identical. Under (4.1) the plural nominative and the singular genitive of class IV nouns have the same, but not necessarily identical, ending. In contrast to this, the singular genitive of class I and class IV is both the same and phonologically identical ending. This principle is also obeyed by the stress hierarchy of Brown et al. (1996), because any feature specification will be realised by identical phonology. Any extension of singular or plural there ultimately inherits the identical atomic symbol for stress.
This stipulation forces us to generalise as much as we possibly can. Remember that we will also be placing ourselves within the declarative constraints of the principles we shall outline and (4.1) has the desirable effect of restricting the logical space of choices that can be made.

4.1 The Hierarchy Identifier Convention

In chapter two, section 2.3, we gave an outline of different attribute types and a list of possible hierarchy identifiers which pick out a particular level of linguistic structure. We stated that they should appear first in a path. We shall call this requirement the Hierarchy Identifier Convention.

(4.2)
*The Hierarchy Identifier Convention*

When they occur in a path, hierarchy identifiers may only appear in first position in that path.

Certain nodes within the theory define interdependencies between hierarchies. These nodes do not contain hierarchy identifiers in their left-hand paths, but otherwise we find that a fact in the morphological hierarchy will start with the hierarchy identifier mor, for example.

4.2 Integrity

We have already seen how nodes are connected by two basic types of relations, namely hierarchy or network relations. However, it might be possible for a node to exist within the theory without being connected to another node, or for a chain of nodes to be present without being attached to the rest of the network. This would be a violation of the integrity of the network and if such a situation is not ruled out would mean that we could allow for totally idiosyncratic items. Consider (4.3), a putative lexical entry for the English lexeme GO, which we have starred to indicate that we wish to rule it out. It is not connected to any nodes and no other nodes refer to it.

(4.3)
*GO:*

\[
\begin{align*}
<\text{root}> & \equiv \text{go} \\
<\text{mor pres} > & \equiv <\text{root}> \\
<\text{mor pres 3rd sg} > & \equiv <\text{root}> _s \\
<\text{mor past}> & \equiv \text{went} \\
<\text{mor past part} > & \equiv \text{gone}.
\end{align*}
\]

This node contains a considerable amount of information for syntax to use and would be a well-formed DATR sentence. However, it is ruled out, because it is not
connected to any other nodes. Our knowledge of English morphology tells us that there are a number of generalisations to be made here, with the exception of the highly idiosyncratic past tense. In order to do this we must connect this node to other nodes which define classes of verbs. Integrity requires us to do this. It should now be clear that this principle states a very important and fundamental assumption about morphology. Even highly idiosyncratic items share some generalisations with other words. This assumption is important, as many theories of morphology resort to listing forms in lexical entries when the representative examples of a particular group are very small. Network Morphology does not reject this in principle, but rather has the highly desirable property of placing an upper limit on such listing.

Although it is relatively straightforward to conceptualise, it is not a trivial task to define integrity. One way to do this might be to use the concept of connectivity as defined in, for example, Munro (1992: 167), which is based on the concept of 'path'. 'Path' (Munro 1992: 163) is a sequence of vertices (nodes) and edges (links) between vertices. If we treat the relations between nodes as the edges and ignore the direction of inheritance, we can then define the integrity of the network in terms of connectivity.

(4.4)

*Integrity*

(i) Every Network Morphology theory T must consist of one connected network.

(ii) The network is connected if for every node x and y in T there is a path P(x,y), where the edges of the path are the relations between nodes.

(Based on Munro 1992: 167)

Clause (ii) of (4.4) basically means that we should be able to trace a route from any node to any other node, if we ignore the direction of inheritance and require only that there be an inheritance relation connecting them. All that we require is that the network be connected.

A few words are in order about this formulation. As Keller (1995) points out, the network metaphor is problematic for understanding DATR, because it makes use of constructs that are difficult to conceptualise in terms of static local inheritance links. Among these, he refers to the dynamic properties of global inheritance and evaluatable paths. The main problem with (4.4) is constituted by interdependency

2Note that this is not in italics, because we are not talking about the paths of a DATR theory.
nodes. For instance, a node for nouns may have a network relation with an interdependency node which switches inheritance between inflectional classes on the basis of the semantics of the noun in question. In a real sense, there is no connection between certain inflectional classes and the nouns which are not assigned to them. However, our definition of Integrity just requires that there be some link between each node. In this sense there is a route from, say, N_II to Zakon 'law', even though Zakon 'law' belongs to N_I. The point is that, as a noun, it is potentially a member of the other class N_II. While this might sound like an extremely complicated statement to grasp, all we are saying is that one must be able to trace some connections from any node to any other node, even if they do not constitute a viable inheritance chain between those nodes. This is still a lot more constrained than saying that there need not be connections between nodes.

4.3 Generalisation Violation

The principle of Generalisation Violation determines which facts may be stated at a node and accordingly the extent to which a particular class (defined by a given node) may conflict in terms of its morphology with another more general class and still be an instance of that class. It also has the desirable effect that it predicts certain kinds of reconfiguration of hierarchies if classes change. We shall not examine this in this thesis, other than to let the reader consider some of the fruitful areas of research that this opens up. Generalisation Violation is motivated by the desire to define varying degrees of exceptionality.

(4.5)

Generalisation Violation

(i) For two nodes connected by a mother-daughter relation there must be no more than one path identity between left-hand paths of the higher and lower node, with the exclusion of the mother-daughter relation, and there must be no path identities if the higher node consists of only one fact in addition to the mother-daughter relation.

(ii) Two paths are identical if they are of the same length and contain the same attributes in the same order.

---

3 Recall that we defined the mother-daughter relation in (3.19).
The effect of this principle is to reduce the number of hierarchies that are possible representations of word structure. Note that the fact that we state the principle as a condition on left-hand paths means that it is irrelevant whether the paths refer directly to atomic values or are referrals (Zwicky 1985) to other paths. An example illegal hierarchy under Generalisation Violation is given in (4.6).

(4.6)

```
MOR_NOUN:
<> == MOR_NOMINAL
<mor sg dat> == "<stem sg>" ^ u
<mor sg gen> == "<stem sg>" ^ a
<mor sg prep> == "<stem sg>" ^ e
<mor pl nom> == "<stem pl>" ^ i.
```

```
N_II:
<> == MOR_NOUN
<mor sg nom> == "<stem sg>" ^ a
<mor sg acc> == "<stem sg>" ^ u
<mor sg dat> == "<mor sg prep>" [GV]
<mor sg gen> == "<stem sg>" ^ i [GV]
<mor sg inst> == "<stem sg>" ^ oj
<mor pl gen> == MGP.
```

In (4.6) we mark path identities relevant for Generalisation Violation with \[GV\]. We do this to highlight the relevant facts in our exposition. The marking \[GV\] plays absolutely no role in the representation of the theory in DATR. We shall employ the \[GV\] marking in chapters five and six to indicate where there are relevant path identities for Generalisation Violation. The hierarchy in (4.6) is illegal, because the paths <mor sg dat> and <mor sg gen> at the node N_II are identical with the paths at MOR_NOUN, to which N_II is connected by a hierarchy relation, and this means that Generalisation Violation is contravened. In chapters five and six we show that there are at least two possible legal hierarchies that do obey the principle of Generalisation Violation, and that adopting this principle means that we are able to choose between competing representations. Note that the principle is a local one. That means that it is only specified for a mother and a daughter. Because it is a local principle, this means that a node can override an indefinite number of facts from the node above its mother. For example, the nodes N_II could override an indeterminate number of facts specified at the node MOR_NOMINAL, the mother of MOR_NOUN. Remember, however, that N_II's mother, MOR_NOUN, and its grandmother, MOR_NOMINAL, are locally constrained by Generalisation Violation. That is, MOR_NOUN cannot override more than one fact of equal specificity at MOR_NOMINAL.
4.4 Paradigmatic Information Addition

To complement the principle of Generalisation Violation we must include the principle of Paradigmatic Information Addition. It is an essential principle that should be assumed by any theoretical framework for linguistic morphology which is surface oriented, although it is rarely made explicit. It rules out the arbitrary introduction of nodes to satisfy Generalisation Violation. It should not be confused with principles of information addition which seek to deny the existence of multiple exponence.

(4.7)

Paradigmatic Information Addition

No node may consist only of a single path: node pairing.

As a node which consisted only of a path: node pairing would inherit all information from the node with which it was in such a relation, it would be pointless to add such a node. It would also be akin to saying that there are classes that are the same in every way, except that they are different classes. This would not make sense. As a principle on its own it is necessary but of little interest for theoretical linguistics. However, it is valid in that it reduces the options open for satisfying the constraints placed on the representation by other principles of the framework.

4.5 The Overextended Ancestor Prohibition

In addition to constraints on the degree to which one class may belong to another class, we need some way of stating that items which belong to different word classes, such as nouns and adjectives, may share morphology which expresses information about categories which they have in common, but that morphology may not be shared where it expresses information about categories which are not common to both classes. As the morphology of word classes in our approach can be expressed in terms of an inheritance hierarchy, nodes higher up in that hierarchy generalise over these morphological classes and therefore should not contain information about a category which does not go with all of the classes over which the higher nodes generalise. A node in violation of this constraint we could call an overextended ancestor. It is overextended, because it contains category information which extends

---

4Note that any node which consisted solely of the fact that it referred to another node for a given path would not be definable in terms of hierarchy relations, as there would be no other facts at that node which might or might not contain left-hand paths which are extensions of that relation.
that of one of the nodes 'below' it (of which it is by definition an ancestor). The constraint is therefore called the Overextended Ancestor Prohibition.

We may illustrate the role of the Overextended Ancestor Prohibition by comparing related nominal classes, which share many, but not all, properties (including morphological categories). This is our reason for grouping these classes together as nominals. We need to generalise those properties which they share as nominals, and we need to account for those dimensions along which they differ. In addition to adjectives and nouns, we treat pronouns as nominals for a number of reasons, which are either based on their syntactic or morphological properties. The first and most obvious syntactic property of pronouns is that they stand in for noun phrase constituents, as in (4.8).

(4.8)
Ja govor'il s prepodavatel'-om.
I spoke with teacher-SG.INST
'I spoke with the teacher.'

Ja govor'il s n'im.
I spoke with him.SG.INST
'I spoke with him.'

There is a difference in syntactic behaviour between the non-third person pronouns and nouns on the one hand, and the third person pronouns and adjectives on the other. The first and second person pronouns control gender agreement only, adjectives are targets for gender agreement, and third person pronouns are both controllers and targets of agreement. With the third person pronouns we know that they are syntactic indices which agree with their antecedent. Like the non-third person pronouns, third person pronouns may also have their gender determined by context. As non-third person pronouns always have gender assigned according to context, they are more like nouns, whose gender may also be determined by facts about the world.

As far as morphology is concerned, we know that adjectives and pronouns may share endings with nouns. For example, the pronoun lexeme ON 'he/she/it' has the nominative singular neuter ending -o which is the same as that for class IV nouns, and the nominative singular feminine ending -a the same as class II nouns. This is also the case for short form and possessive adjectives. Note that it need not be the case that this is related to the default gender assignment of the noun classes, as the second and first person pronouns have the same singular instrumental ending as class II nouns, namely -oj(u).
Note also that, if we consider the different inflection classes of adjectives, nouns and pronouns, the majority realise the plural nominative with the ending -i. What is more, we also know that the plural instrumental, dative and prepositional endings are the same for adjectives, nouns and the third person pronouns, with the exception that nouns have a different theme vowel. This relationship was partially captured by Corbett and Fraser (1993) in their treatment of nouns and adjectives. Furthermore, the first and second person pronouns also have the same instrumental plural and share the generalisation for adjectives that the plural genitive is the same as the plural prepositional.

Considering both the syntactic similarities and the sharing of morphology we see that there is good reason to include pronouns in our treatment of nominal morphology. However, there is a difference between the first and second person pronouns and nouns on the one hand, and third person pronouns and adjectives on the other. The third person pronoun ON 'she/he/it', as our glosses indicate, varies for the realisation of gender. This means that the paths which are paired with values for the realisation of their morphology must contain gender features. In contrast to this, the paths in the facts which stipulate the morphology of first and second person pronouns contain only number and case feature combinations. This approach to the treatment of non-third pronouns and nouns which sees gender as inherent to the noun lexeme and not a grammatical property of it, as it is property for adjectives, is not new (see Lehmann 1982: 204 and Matthews 1991: 45-48). The difference between suprug '(male) spouse' and supruga '(female) spouse' is one of inflectional class, and Fraser and Corbett (1995) have already shown how semantics is used to assign a given lexeme to inflectional class.

This is not to say, of course, that first and second person pronouns and nouns do not give information about gender. In Corbett and Fraser (1993) and Fraser and Corbett (1995) nouns are assigned a value paired with the path <syn gender>. The same should also be true for first, second and third person pronouns. The latter are interesting in that they have both a morphological realisation of gender and also a value for syntactic gender which is determined by context. It is this last fact which makes the pronouns, first, second and third person, different from nouns. Their syntactic gender will alter according to the context of discourse. In sum, adjectives realise morphological paths which specify gender as well as number and case. Third person pronouns do the same. First and second person pronouns and nouns do not specify gender in their morphological paths. Adjectives do not specify any value for syntactic gender. That is, adjectives do not define a value to be paired with the path
First, second and third person pronouns and nouns do define a value for this path. This is summed up in table 4.1.

<table>
<thead>
<tr>
<th>Nominal Type</th>
<th>Gender specified in &lt;syn gender&gt; path</th>
<th>Value defined for &lt;syn gender&gt;</th>
<th>Value for &lt;syn gender&gt; invariant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nouns</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>First person pronoun</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Second person pronoun</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Third person pronoun</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Adjectives</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 4.1: The morphological and syntactic properties of nominals

Of primary interest for nominal morphology is the second column of table 4.1 in which we see that third person pronouns and adjectives actually inflect for gender. It is at this point that the Overextended Ancestor Prohibition applies to nominal morphology. The principle is introduced in (4.9).

\[
(4.9) \quad \textit{The Overextended Ancestor Prohibition (OAP)}
\]

If node A is in a hierarchy relation with B, no path at B may extend the categories of a path at A, with the exclusion of the hierarchy relation. 5

An example of an illegal fact is given in (4.10) where we attempt to state that the singular dative feminine is the same as the singular prepositional feminine for adjectives, and by a naive linguist's intuition place this fact at MOR_NOMINAL because it also appears to be true of class II and class III.

\[
(4.10) \quad \text{MOR_NOMINAL:} \\
\text{<mor> == "<stem>"} \\
\text{<mor sg dat> == "<mor sg prep>"} \\
\text{<mor sg prep fem> == "<stem>" ^ oj.} \\
\]

\[
\text{MOR_NOUN:} \\
\text{<> == MOR_NOMINAL} \\
\text{<mor sg prep> == "<stem>" ^ e.} \\
\]

5Note that we have given hierarchy relation a specific meaning within Network Morphology, as in (3.23). When we say 'A is in a hierarchy relation with B' we mean that B is the source of inheritance for A. In this sense we could say that 'B dominates A'. However, B could also be said to dominate A, if B were an orthogonal source of inheritance (via a network relation). However, in that case A would not necessarily be in a hierarchy relation with B.
If we consider table 1.3 in chapter one, it should be clear that this small fragment will give us the correct forms for the singular nominative, singular dative and singular prepositional of class I and class II nouns. In addition, it will also give us the correct forms for the singular dative feminine and singular prepositional feminine of adjectives. However, this hierarchy is currently an illegal entity, because of the situation of the fact stating the realisation of the singular prepositional feminine. The path \texttt{<mor sg prep fem>} at the node \texttt{MOR_NOMINAL} extends the path \texttt{<mor sg prep>} at \texttt{MOR_NOUN}, and \texttt{MOR_NOMINAL} is therefore an \textit{Overextended Ancestor} in violation of \textit{OAP}.

Brown (forthcoming) gives some concrete examples of how the \textit{OAP} interacts with the ordering of \textit{features} we have discussed in section 2.4. As indicated by table 4.1, nouns do not specify the category of gender in their \textit{paths}, because they do not change gender within their paradigm, whereas adjectives, as agreement targets, do. This means that certain adjectival \textit{facts} will contain \textit{paths} that specify gender, whereas noun \textit{paths} will not. In (4.11), for instance, we give the \textit{paths} associated with the realisation of the singular dative feminine of the Russian adjective \textit{novij} 'new' and the singular dative of the Russian noun \textit{gostinica} 'hotel' which is feminine in gender.

(4.11)
\begin{align*}
\texttt{<mor sg dat fem>} &= \text{nov} \ ^{\text{oj}}. \\
\texttt{<mor sg dat>} &= \text{gost'\text{in'\var{ica}} \ ^{\text{e}}}.
\end{align*}

Generally, the \textit{OAP} means that we should expect those \textit{facts} which do not specify gender to be more likely candidates for sharing between nouns and adjectives. In Russian, for example, nouns share with adjectives the dative, instrumental and prepositional case endings in the plural (Corbett and Fraser 1993).\(^6\) If we compare in (4.12) the realisations of the plural dative of the Russian adjective \textit{novij} 'new' and the Russian noun \textit{gostinica} 'hotel', we see that their \textit{paths} are equal in specificity.

\(^6\)Although their theme vowels differ, of course.
The *OAP* prohibits the realisation of the singular dative feminine of Russian adjectives from being a nominal default because of the presence of the gender feature. In (4.12) it allows the realisation of the plural dative to be a nominal default, because of the lack of a gender feature. This is related to our argument about the ordering of features in section 2.4, where plural number triggers, in the sense of Carstairs (1984), loss of gender distinction. Combining the ordering of features with the *OAP* makes us claim that there is a relationship between the morphology shared by nouns and adjectives and the trigger features of Carstairs (1984).

The useful effect of this principle should now be clear. Generalisations about nominal morphology can be made if they make use of features of categories shared by all of nominal morphology. This does not rule out placing realisations used by adjectives at MOR_NOMINAL. It is obvious, however, that such realisations will not be restricted solely to one of the three genders in Russian. This is why plural endings are most likely to be shared, as gender distinction is eliminated in the plural.

### 4.6 The Referrals Principle

The need for referrals is motivated by Zwicky (1985). Network Morphology defines what a referral is in terms of the formal representation in DATR and when a referral is a legal entity. This is given in (4.13).

(4.13) **Referrals Principle**

(i) A referral is a fact in which a path beginning with a particular hierarchy identifier refers to another path beginning with the same hierarchy identifier for its value.

(ii) Referrals require that the left-hand and right-hand sides of the path: path pairing contain features of the same category and in the same order.

(iii) The left-hand side and the right-hand side of the path: path pairing must be of the same length.

A few words of qualification are in order with regard to (4.13). Clause (i) of (4.13) defines what a referral is, and it is crucial for this definition that we talk of a path:path pairing where both paths begin with the same hierarchy identifier. There will be facts in a Network Morphology theory which involve path:path pairings where the hierarchy identifier on the left-hand side and the hierarchy identifier on the right-hand side are not the same. For example, when we state that the morphology of...
the singular genitive of class I nouns is realised by the stem and the ending -a. This would involve a pairing of a path which begins with the hierarchy identifier mor with a path which begins with the hierarchy identifier stem. Quite clearly, such a fact would not obey clauses (ii) and (iii) if we did not define referrals in terms of hierarchy identifiers. Interdependency nodes are also not subject to (4.13). because they do not contain hierarchy identifiers, nor are evaluable paths. Evaluable paths involve a particular if-then statement that should be transparent. Referrals, because they bring about syncretism, are possible sources of opacity. The point of clauses (ii) and (iii) of (4.13) is to capture the important fact that referrals still maintain category information while blurring information about the particular features of the category. For instance, while we may wish to say about Russian that the plural genitive is the same as the plural prepositional, the realisations -ix, -ax, or -as are still realisations of number and case.  

Note that (4.13) still allows referrals that we would ultimately wish to rule out on typological grounds. That is, we may decide that it is necessary to say that there can be no example of a referral where <mor sg> refers to <mor pl>, or where a path containing the feature nom refers to one containing a feature for an oblique case.  

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7It has been pointed out to me independently by Greville Corbett, Andrew Hippisley and Christof Rumpf that clause (ii) of (4.13) appears as though it should be a principle in its own right. However, as my explanation of the crucial importance of hierarchy identifiers for (4.13) indicates, it is important to be able to have inheritance between different levels of linguistic structure which are not subject to (ii), and this crucially requires that (ii) only applies to path:path pairings beginning with the same hierarchy identifier, part of the definition of referral in (i) of (4.13). Clause (ii), which we could refer to as the Subprinciple of Category Preservation should apply within any given level of morphological structure, but cannot apply between them, as these levels by definition have to deal with different category types. Note that given this formulation, however, any level of linguistic structure must obey this principle. It is just that it need not be obeyed for inheritance between such levels of linguistic structure. For instance, where one stem referred to another stem, (4.13) would have to be obeyed. Where one morphosyntactic feature specification referred to another (4.13) would have to be obeyed. 

8The formulation of such possible prohibitions may be too simplistic. For instance, it could be argued that the disjunctive affixes of Hua (Haiman 1980) which realise either first person plural or second person singular involve a referral of second person singular to first person plural, because number distinction is more important for first persons and than second persons, in line with the Smith-Stark hierarchy (Smith-Stark 1974). This would on one reading involve a referral of singular to plural (see Brown In draft).
does, however, make a strong claim about the nature of referrals. If the term had not already been coined for another phenomenon we could claim that referrals are 'category-preserving'. That is, although the features of the paths in question could be considered to be opposed to one another, they are not categorially incompatible. Consider the examples in (4.14).

(4.14)

a. \(<\text{mor pl gen}> == "<\text{mor pl prep}> "

b. \(<\text{mor pl}> == "<\text{mor sg}>"

c. *\(<\text{mor sg dat neut}> == "<\text{mor sg dat}>"

d. *\(<\text{mor sg dat}> == "<\text{mor sg dat neut}>"

(4.14a) is fine because a path containing the features of the categories NUMBER and CASE in that order refers to another path containing features of the categories NUMBER and CASE in the same order. In (4.14b), which is legal, a path containing a feature of the category NUMBER refers to another one containing a feature of the category NUMBER. Remember that these paths would be ruled out in the morphology hierarchy by the Hierarchy Identifier Convention, if they did not begin with the attribute mor. Finally (4.14c) and (4.14d) are ruled out, because in the first category information (i.e. GENDER) is added by the referral, and in (4.14d) the referral eliminates information about the category GENDER. The reader should think carefully about what this is saying. First, it should be noted that we definitely are not claiming that category information cannot be lost. Indeed, we have based our argumentation about attribute ordering on facts where it is. What (4.14c) in effect states is that the value which is specific to singular dative neuter is the same as the value which is general to the singular dative as a whole. But if there were a value specific to the singular dative neuter, then by definition it could not also be a general value for the singular dative. It can also be seen that it is a good idea to rule out (4.14d), because this states that the realisation of the singular dative as a whole is the same as the singular dative neuter. While this might be true, it cannot be true that a realisation which is not specified for the category GENDER is also specified for it.

4.7 Intra-hierarchy Network Relations Principle

In chapter two, section 2.1, we outlined the concept of a network relation between nodes of different hierarchies. In certain circumstances it is possible for nodes of the same hierarchy to be connected by network relations. This is analogous
to a referral for morphological class information. That is, one morphological class may refer to another for information about the realisation of particular morphosyntactic combinations. This type of referral is treated by a separate principle. Whether the Intra-hierarchy Network Relations Principle can be combined with the Referrals Principle is a matter which goes beyond the scope of this thesis. It should crucially be seen that it differs in the subprinciples (ii) and (iii).

(4.15)

**Intra-hierarchy Network Relations Principle**

(i) An Intra-hierarchy Network Relation involves a path:node pairing where the left-hand side path and the path at the node paired with it on the right-hand side both contain the same hierarchy identifier.

(ii) Intra-hierarchy Network Relations require that the left-hand path and the right-hand path with which it is paired contain exactly the same features in the same order.

(iii) A left-hand path may not be paired with a right-hand path which is its extension.

The essential difference between (4.15) and (4.13) is that (4.15) claims that syncretism shared by morphological classes cannot also involve reference to a different feature combination. Hence, the fact that the singular prepositional of kost 'bone' (class III) is kost'-i and the singular genitive of komnata (class II) 'room' is komnat-i is not because class III inherits the value for its singular prepositional from class II's singular genitive. The two theories of Russian nominal morphology we outline in chapters five and six respectively give different reasons for the sharing of this morphology. Under the analysis in chapter five classes II and III inherit from a shared node which states that their singular genitive is the stem plus -i, and class III,

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9 It would almost be correct here to say inflectional class information, rather than morphological class. The term morphological class also covers the morphological class of nouns and verbs and so on, from which inflection classes inherit.

10 This has been called the Node-Node Referrals Principle in Brown (1996). It should also be noted that the effect of clauses (ii) and (iii), which we may refer to as the Subprinciples of Feature Preservation and Information Maintenance respectively, is that the right-hand side path need not be explicitly given, because of the DATR convention that the path at the node referred to on the right-hand side need not be given if it is identical to the path on the left-hand side. That they be identical is what clauses (ii) and (iii) require, of course.
within the constraints of (4.13), has a referral to the singular genitive for its singular prepositional. Under the analysis in chapter six, which is the one we favour, for the value of its singular genitive class III refers to class II's singular genitive, within the constraints of (4.15), and the singular prepositional of class III refers to the singular genitive, as this is then locally available for class III and comes within the constraints of (4.13).

4.8 Multiple Intra-hierarchy Network Relations Prohibition

In order to ensure that information is shared in a non-redundant way it is necessary to stipulate that there cannot be multiple network relations between nodes which share a mother (which therefore means that this principle applies to network relations between nodes of the same hierarchy.)

(4.16)

Multiple Intra-hierarchy Network Relations Prohibition

(i) A node X may not contain more than one fact involving reference to a node Y, if nodes X and Y share the same mother (i.e. if X and Y are in a mother-daughter relation with a node Z).

(ii) If node X contains a fact involving reference to node Y, and node Y contains a fact involving reference to node X, then nodes X and Y cannot share a mother.

The point of the first clause of (4.16) is that it does not make sense for two nodes to share the same mother if they are also sharing a great deal of information orthogonally via network relations. In fact, we shall see in chapters five and six examples of sister nodes having one network relation between them, but no more than one. Clause (ii) rules out reciprocal intra-hierarchy network relations between sisters entirely. For example, class I could not refer to class IV for its singular dative, and class IV to class I for its singular instrumental, if it were the case that they shared a common mother.\(^{11}\)

This is the last of the principles that we introduce in this chapter. We shall now go on to consider how they should be applied in the configuration of an inheritance hierarchy for Russian nominal morphology.

4.9 Configuring a hierarchy

In this section we outline some heuristics which will be applied in the next chapter in the configuration of the hierarchy. These are not principles of the Network

\(^{11}\)As we shall go on to show, they do share a common mother.
Morphology framework, but help us to determine the configuration when the principles do not speak against this. We have chosen to deal with the nominal morphology of Russian in general, not for the sake of quantity, but in order to demonstrate the complex interactions to be found when a hierarchy is configured. The existence of particular facts for one class has an effect on the shape of the whole hierarchy. It should also be emphasised that this thesis is not about the acquisition of linguistic knowledge. We illustrate in chapters five and six how a hierarchy might be configured. As this thesis is not concerned with learning or induction of hierarchies (for which see Barg 1996), the important question for us is which hierarchies are allowed in their final state. Whereas Generalisation Violation and the Overextended Ancestor Prohibition, for example, are absolute principles of the framework, we also use a number of heuristics to determine where facts should be placed. These are not part of the framework. These include (4.17).

(4.17) 
Unique inflections
Unique inflections should be put at the class node and no higher.

Generally, it does not make sense to assume that a unique realisation should be placed as a default for a class of words as a whole, although this depends to some extend on whether one limits oneself to a particular word class. Wurzel (1990: 207), for example, uses "Kennformen", which can be compared with unique realisations, for the prediction via redundancy rules of other forms within a paradigm. As Zwicky (1990: 225) points out, however, there is no reason to assume that grammar always make "Kennformen" available. This is why (4.17) is not a principle of the framework, but rather a heuristic. There is a connection with Generalisation Violation, since if a unique inflection were treated as a default, then other classes would have to override this information, thereby using up their allowed path identity with a higher class. (4.17) therefore enables us to configure the hierarchy such that it will be less likely that it needs altering.

Whereas it is obvious that we would not wish under normal circumstances to claim that a realisation unique to one class could be treated as a default, it appears to

12 For instance, in a theory which did not take into account information-sharing, the singular instrumental -o(f)u is considered a unique inflection for class II nouns. Although in our treatment it will end up placed at the class node N II, it is not unique, because it is shared by nouns and adjectives. It would be considered unique if only nouns were taken into consideration, however.
be sensible to claim that the realisation common to the majority or most classes should appear as the *default*, with the proviso that particular inflectional classes may have a greater number of members than others. Again, this is a heuristic which enables us to configure the hierarchy subject to the hard-and-fast principles outlined here and in chapter two. We shall refer to our assumption about the majority realisation as the *Majority Default* assumption.

(4.18)

**Majority Default**

The affix or *referral* which is shared by most inflection classes is treated as the *default*.

Note that (4.18) is not just a generalisation about affixes. It applies also to *referrals*, which we have discussed earlier in this chapter. Where a referral and an affixal realisation are in competition on the basis of (4.18) we shall apply the heuristic of (4.19).

(4.19)

**Referrals Beat Affixes**

Where there may be competing candidates which cannot be determined by *Majority Default*, referrals take precedence over paths which are paired with a reference to stems and an atomic value for suffixes.

Finally, it should be noted that, according to the principles of the framework, the choice of *default* at one level may influence the choice of *default* at another. We illustrate this in chapters five and six, where we outline two different theories of Russian nominal morphology.

**4.10 Conclusion**

In this chapter we have laid out a number of principles that we claim should be universal for at least the set of languages which have inflectional classes and fusional morphology. In the next chapter we go on to show how they apply to a non-trivial fragment of Russian nominal morphology.
PART II

THEORIES OF RUSSIAN NOMINAL MORPHOLOGY
CHAPTER FIVE

Theory A

5.0 Introduction

Having introduced a number of principles of the Network Morphology framework, we illustrate in this and the following chapter how the framework underdetermines the configuration of a nominal hierarchy, and that there are at least two different hierarchies that are allowed for by the framework. These two hierarchies constitute different theories of Russian nominal morphology (theory A and theory B). The framework makes it explicit that these two theories are incompatible and that a choice must be made. This choice has to be motivated on empirical grounds and should not be determined by principles of the Network Morphology framework.

The theory that is outlined in this chapter could be called the 'feminine approach', in which it is claimed that the classes N-II and N-III share a common node, labelled N_AI, intermediate between them and the node for noun morphology. The existence of this node is connected with acceptance of A-III adjectives, those such as otcov 'father's', as a synchronically valid class. Adjectives of this class realise singular genitive (masculine and neuter) and singular dative (masculine and neuter) as -a and -u respectively, following the noun classes I and IV. We show that there is a correlation between treating -a and -u as nominal defaults for singular genitive and singular dative and introducing a node to generalise over the noun classes N-II and N-III. We refer to this theory, in which there is a node N_AI and -a and -u are nominal defaults for singular genitive and singular dative, as theory A. Theory A is contrasted with theory B in the next chapter, where there is a node N_O generalising over noun classes I and IV and -a and -u are not treated as nominal defaults.

On the basis of Russian noun morphology Corbett and Fraser (1993) have proposed a theory similar to theory B. In this chapter we show that theory A follows from resolving in a particular way the conflict between what is general for nominals as a whole and what is general for adjectives. That is, theory A treats what is true of most nominals as more important than what is true of most adjectives. It does this by giving prominence to a marginal class of adjectives, the A-III type, which we show in chapter six has very few representatives.

We also show that the choice of -a and -u as nominal defaults for singular genitive and singular dative in theory A conflicts with argumentation in 5.2 regarding
the use of referrals as opposed to path extension to capture syncretisms. We argue that the syncretism in the oblique cases of the singular between masculine and neuter is the result of the ordering imposed between case and gender (discussed in 5.1), but the elevation of the A_III class means that there has to be a 'long-form' node under the general node for adjectives, and because all adjectives share the same oblique forms for the feminine, any fact located at the 'long-form' node under the general node for adjectives cannot be underspecified for gender, as this would be a violation of the Overextended Ancestor Prohibition. As we show in 5.6, this means that the syncretism between the singular genitive masculine -ovo and singular genitive neuter has to be referral-based, with similar arguments applying for the singular dative, contra our argumentation in 5.1. Hence masculine and neuter syncretism in the singular dative and singular genitive of long-form adjectives is made to look accidental.

Section 5.1 builds on our typological argumentation in chapter two regarding the ordering of features in a path. After this we show that there is a substantive difference between referral-based and extension-based syncretism (section 5.2), argumentation which also indicates that theory A is not as valid as theory B. In section 5.3 it is argued that only feature specifications of equal specificity are in competition. Furthermore, no feature specification which contains a gender feature can be in competition as a nominal default, because it would violate the Overextended Ancestor Prohibition. From 5.4 to 5.6 we apply our heuristics to consider what might be nominal defaults (section 5.5) and then go on to consider what facts are allowable as noun defaults (section 5.5) and adjectival defaults (section 5.6). Section 5.7 outlines our reasons for setting up the node N_AI, and we see that this is connected with having -a and -u as the nominal defaults for singular genitive and singular dative. In section 5.8 we discuss the singular instrumental, and then go on to draw some conclusions (section 5.9), in particular that we have to decide whether stating what is general for adjectives is more important than stating what appears to be general for nominals. We conclude that, as we are required to have a node for the morphology of adjectives anyway, that stating what is general for adjectives is more important than stating what appears to be general for nominals. This then argues against theory A and motivates theory B which we outline in chapter six.

We first need to consider the status of facts in relation to each other and how to determine which facts are in competition as defaults.

5.1 The Nature of Nominal Facts

In order to determine the configuration of possible hierarchies we need to consider the nature of nominal facts. Table 5.1 contains endings for a representative
sample of Russian nominal morphology. Moving from left to right takes us from the most adjectival to the most noun-like morphology. Appendix II contains tables which give the relevant adjectival, pronominal and noun morphology, including stems. Table 5.1 here gives only the endings. We have not included demonstratives such as etot 'this', or possessive pronouns, such as nas 'our'. Generally, the differences between these closed class items and the adjectival declensions usually involve changes in the stem. The modifier ves 'all' would also require stipulation of a different theme vowel in the plural, namely -e-, together with an idiosyncratic plural nominative. It should be noted that the endings that short form adjectives have are represented by classes A-II and A-III for the singular nominative, and there is no oblique case morphology for predicative adjectives.

<table>
<thead>
<tr>
<th>Adjectives</th>
<th>Pro.</th>
<th>Adjs</th>
<th>Pro.</th>
<th>Nouns</th>
</tr>
</thead>
<tbody>
<tr>
<td>A_I 'Long-form'</td>
<td>A_II</td>
<td>Third</td>
<td>A_III</td>
<td>Non-third</td>
</tr>
<tr>
<td>sg nom</td>
<td>-ii, -oj, -aja</td>
<td>-Ø, -o, -a</td>
<td>-Ø, -o, -a</td>
<td>-Ø, -o, -a</td>
</tr>
<tr>
<td>sg acc</td>
<td>EVAL</td>
<td>EVAL</td>
<td>EVAL</td>
<td>EVAL</td>
</tr>
<tr>
<td>sg gen</td>
<td>-ovo, -oj</td>
<td>-ovo, -oj</td>
<td>-ovo, -oj</td>
<td>-a, -oj</td>
</tr>
<tr>
<td>sg dat</td>
<td>-omu, -oj</td>
<td>-omu, -oj</td>
<td>-omu, -oj</td>
<td>-u, -oj</td>
</tr>
<tr>
<td>sg inst</td>
<td>-im, -oj(u)</td>
<td>-im, -oj(u)</td>
<td>-im, -oj(u)</td>
<td>-oj(u)</td>
</tr>
<tr>
<td>sg prep</td>
<td>-om, -oj</td>
<td>-om, -oj</td>
<td>-om, -oj</td>
<td>-om, -oj</td>
</tr>
<tr>
<td>pl nom</td>
<td>-ije</td>
<td>-i</td>
<td>-i</td>
<td>-i</td>
</tr>
<tr>
<td>pl acc</td>
<td>EVAL</td>
<td>EVAL</td>
<td>EVAL</td>
<td>EVAL</td>
</tr>
<tr>
<td>pl gen</td>
<td>-i-x</td>
<td>-i-x</td>
<td>-i-x</td>
<td>-i-x</td>
</tr>
<tr>
<td>pl dat</td>
<td>-i-m</td>
<td>-i-m</td>
<td>-i-m</td>
<td>-i-m</td>
</tr>
<tr>
<td>pl inst</td>
<td>-i-m'</td>
<td>-i-m'</td>
<td>-i-m'</td>
<td>-i-m'</td>
</tr>
<tr>
<td>pl prep</td>
<td>-i-x</td>
<td>-i-x</td>
<td>-i-x</td>
<td>-i-x</td>
</tr>
</tbody>
</table>

Table 5.1: An overview of Russian nominal endings

1A_I and A_III are so-called possessive adjectives. The adjectives mam 'mother's' and rib 'fish's' are examples of A_II, and the adjective otcov 'father's' is an example of A_III.

2The assumption here is that the singular nominative of the first person pronoun ja and the second person pronoun ti are singular nominative stems.

3The stem assumed here for the oblique cases is j-. However, it is replaced by a palatalised n' when the pronoun is preceded by a preposition. For the prepositional case this will always be true. Note also that the stress on the endings of the oblique cases and the feminine gender indicate a difference in vowel quality from that assumed for adjectives in general on the basis of hard stems.

4Where three endings are given they occur in the order masculine, neuter, feminine. Where two endings occur this means that the realization of masculine and neuter is syncretic. Where one ending
Given that they constitute a very small closed set, the personal pronouns are not assigned inflectional classes of their own. The third person pronouns are assumed to belong to the A_II inflection class. Any guidelines for configuring the nominal hierarchy based on inflection classes must therefore assume that the third person pronouns and class A_II are one and the same. The non-third person pronouns can be used to help us decide where information is to be placed when there is little else to go on.

It should be noted from table 5.1 that cells in the columns for the adjectival classes and third person pronouns may contain more than one realisation. This is because the morphology of these items differs along the additional dimension of gender. The difference between Russian adjectives and nouns is that adjectives have (target) gender. That is, they must agree with their head noun on the basis of its gender. Nouns, on the other hand, have inherent gender, but do not specify gender in their inflectional paths, because it is invariant for a given lexeme. Furthermore, specification of gender in inflectional paths would lead to a conflict with gender determined on semantic grounds (such as the sex of the referent). The noun дядя 'uncle', for example, belongs to inflectional class II but requires masculine agreement, as in (5.1).

(5.1)

она говорит с моим двоюродным братом
'she speaks with my-stative.NOM.MASC brother-STATIVE.NOM.MASC'

A default inheritance approach to morphology which did not impose the ordering of features shown in chapter two, and allowed for the stipulation of gender as part of morphological facts about nouns, could state that the default realisation of morphology is 'feminine', but that agreement is determined according to the semantics of the noun. As well as ignoring the fact that class I contains the majority of Russian nouns, this would fail to take into account that gender is invariant for any given noun. Furthermore, Corbett (1982) has argued that gender need not be specified in lexical entries, because it can be predicted either from the inflectional class or from the
semantics of the noun, which need to be specified anyway. Where there is a conflict, as with d'ad'a, the noun semantics win. The only alternative is to specify gender lexically and then to restrict the realisation of particular morphological paths containing gender features.

In fact, if we chose to include gender information in morphological paths, then there would be very little structuring in morphological classes. What would be required is a statement that, by default, neuter was the same as masculine. The only distinct inflectional class would be N_III, because the paradigms for N_1, N_IV and N_II would be distinct paths. However, this would run into massive problems. Each noun would have to specify its gender lexically in order to determine which facts it was allowed to realise. With a noun such as d'ad'a, for example, it would be stated that its gender was masculine but that it realised the morphological paths which contained the feminine feature. Such an ad hoc solution would fail to take into account the fact that d'ad'a is assigned masculine gender for a good reason, because of its semantics. Furthermore, an approach which permits arbitrary lexical stipulation would allow any noun to realise feminine morphological paths and be assigned masculine gender, or any noun to realise masculine morphological paths and be assigned feminine gender. For example, such an approach would predict that a noun komnata 'room (prime)' could have 'feminine' realisations and masculine gender, which does not happen. Indeed, this approach runs up against the standard problem of any theoretical framework which allows unrestricted lexical stipulation of gender, lack of predictive power. It could be argued that what one requires in such a case are principles to govern this unrestricted stipulation of gender to lexical items. This is, of course, precisely what our approach offers. Gender in Russian can only be assigned according to membership of an inflectional class, or on the basis of noun semantics.

In sum, gender should not be included in facts about the morphology of noun inflection, but should be associated with a particular inflectional class, or assigned according to the noun semantics. The import of this is that facts for nouns will be of the form in (5.2), whereas those for adjectives could be of the form in (5.3).

(5.2)
<mor number case> == "<stem>" _ ending

(5.3)
<mor number case gender> == "<stem>" _ ending

In (5.2) and (5.3) the emboldened items stand for categories, to which a set of features belong. This is just a shorthand device to illustrate the point we are trying to make. It is not part of the DATR formalism which is used to represent our theories.
The point of (5.2) and (5.3) is to highlight that the left-hand side of any fact for noun classes cannot extend a path with gender information. For adjectives a gender feature could be introduced. When we are trying to determine which facts are defaults the Overextended Ancestor Prohibition disallows the specification of facts of the form in (5.3) at the node for nominal morphology, as the gender feature will extend paths at the noun declension nodes. As the gender distinction is lost in the plural of adjectives, this means that plural morphology is more likely to be shared by all nominals, because the facts will be of the form (5.2).

As plural conditions loss of the gender distinction, this means that in principle any adjectival or noun realisation has the potential to be a nominal default for that number. With the singular the situation is not so clear-cut. In theory, every adjectival realisation could realise a gender feature. However, examination of table 5.1 and those in appendix II shows us that the distinction between masculine and neuter gender is lost in the oblique cases of the singular, which might well suggest that the facts which state the realisations of the oblique cases in the singular do not contain a gender feature. On the other hand, the feminine gender is always distinguished from the masculine and neuter. This would suggest that no realisation which is used for feminine agreement in adjectives can possibly be a default ranging over nouns and adjectives.

Having determined that nouns do not specify a gender feature for their morphological paths, we must determine the best way to handle the gender syncretism in adjectival morphology. More specifically, is it referral-based or the result of underspecification? We shall argue that it is the result of underspecification, and then show later in section 5.6 that this conclusion is partly undermined if we adopt theory A.

5.2 Referrals versus Path Extension

Remember that our choice of attribute ordering for adjectives is motivated by considerations of a particular feature of a category conditioning the presence or absence of a feature of another category. For instance, we know that there are more case distinctions in the singular than in the plural. The fact that there are additional cases, such as the second locative and the second genitive, which are manifested in nouns only in the singular would not follow naturally if one assumed that case were ordered before number. One would then expect there to be second locative plurals and second genitive plurals. Further, for adjectives the (target) gender distinction between masculine and neuter is lost in the oblique cases. This suggests that GENDER is ordered after CASE. We shall return to this point once we have
considered the long-form adjective examples, given as class A-I in (5.4).

(5.4)

A-I:

\[
\begin{array}{l}
<\text{mor sg nom masc}> == "\text{stem}" -ij \\
<\text{mor sg nom neut}> == "\text{stem}" -ojo \\
<\text{mor sg nom fem}> == "\text{stem}" -aja \\
<\text{mor sg gen}> == "\text{stem}" -ovo \\
<\text{mor sg gen fem}> == "\text{mor sg prep fem}" \\
<\text{mor sg dat}> == "\text{stem}" -omu \\
<\text{mor sg dat fem}> == "\text{mor sg prep fem}" \\
<\text{mor sg inst}> == "\text{stem}" _im \\
<\text{mor sg inst fem}> == "\text{stem}" _oj(u) \\
<\text{mor sg prep}> == "\text{stem}" _om \\
<\text{mor sg prep fem}> == "\text{stem}" _oj \\
<\text{mor pl nom}> == "\text{stem}" _ije \\
<\text{mor theme_vowel}> == _i. \\
\end{array}
\]

In (5.4) we assume a minimal hierarchy in which A-I is attached to a node for all nominal morphology MOR-NOMINAL, without an intervening node for adjectival morphology. The syncretism between masculine and neuter is expressed in terms of feature ordering, where the assumption is that the oblique cases are underspecified for the GENDER category. The paths not extended by a GENDER feature could be specified at the higher node MOR-NOMINAL. This would not be the case if we assumed that every path at A-I must specify a gender feature, as in (5.5).

(5.5)

A-I:

\[
\begin{array}{l}
<\text{mor sg nom masc}> == "\text{stem}" -ij \\
<\text{mor sg nom neut}> == "\text{stem}" -ojo \\
<\text{mor sg nom fem}> == "\text{stem}" -aja \\
<\text{mor sg gen masc}> == "\text{stem}" -ovo \\
<\text{mor sg gen neut}> == "\text{mor sg gen masc}" \\
<\text{mor sg gen fem}> == "\text{mor sg gen masc}" \\
<\text{mor sg dat masc}> == "\text{stem}" -omu \\
<\text{mor sg dat neut}> == "\text{mor sg prep fem}" \\
<\text{mor sg dat fem}> == "\text{mor sg prep fem}" \\
<\text{mor sg inst masc}> == "\text{stem}" _im \\
<\text{mor sg inst neut}> == "\text{mor sg inst masc}" \\
<\text{mor sg inst fem}> == "\text{stem}" _oj(u) \\
<\text{mor sg prep masc}> == "\text{stem}" _om \\
<\text{mor sg prep neut}> == "\text{mor sg prep masc}" \\
<\text{mor sg prep fem}> == "\text{stem}" _oj \\
<\text{mor pl nom}> == "\text{stem}" _ije \\
<\text{mor theme_vowel}> == _i. \\
\end{array}
\]

There are four more facts in (5.5) than in (5.4). Although this indicates that (5.4) is preferable, we should not jump to conclusions too readily. Note that the neuter extensions of a path refer to the masculine extensions of the same path. (5.5) thereby fails to capture the generalisation that masculine and neuter adjectives are
syncretic in all cases in the singular except the nominative. The use of referrals makes this seem purely accidental. (5.5) contains 16 equations compared to 14 in (5.4) and makes it look accidental that when the neuter is syncretic it will be syncretic with the masculine.

We already have reason to prefer (5.4) over (5.5), but more explicit criteria are required for deciding when "implicit quantification over all extensions of a path" (Gazdar 1990: 12) and when referrals are appropriate to capture syncretisms. Corbett and Fraser (1997) discuss how best different kinds of syncretism are represented. On the basis of data from Slovene, they argue that the asymmetrical relation that referrals represent is indeed to be found in linguistic systems. In table 5.2 we see that the dual genitive is the same as the plural genitive.

<table>
<thead>
<tr>
<th></th>
<th>SINGULAR</th>
<th>DUAL</th>
<th>PLURAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom</td>
<td>kót</td>
<td>kóta</td>
<td>kóti</td>
</tr>
<tr>
<td>acc</td>
<td>kót</td>
<td>kóta</td>
<td>kóte</td>
</tr>
<tr>
<td>gen</td>
<td>kóta</td>
<td>kótov</td>
<td>kótov</td>
</tr>
<tr>
<td>dat</td>
<td>kótu</td>
<td>kótoma</td>
<td>kótom</td>
</tr>
<tr>
<td>inst</td>
<td>kótom</td>
<td>kótoma</td>
<td>kóti</td>
</tr>
<tr>
<td>loc</td>
<td>kótu</td>
<td>kótih</td>
<td>kótih</td>
</tr>
</tbody>
</table>

Table 5.2: Paradigm of the Slovene noun kót 'corner'
(data from Priestly 1993: 400)

In table 5.3 we see the same relation, and this time it is clear that the dual refers to the plural, rather than the other way round.

<table>
<thead>
<tr>
<th></th>
<th>SINGULAR</th>
<th>DUAL</th>
<th>PLURAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom</td>
<td>člověk</td>
<td>člověka</td>
<td>ljudě</td>
</tr>
<tr>
<td>acc</td>
<td>člověka</td>
<td>člověka</td>
<td>ljudí</td>
</tr>
<tr>
<td>gen</td>
<td>člověka</td>
<td>ljudí</td>
<td>ljuděm</td>
</tr>
<tr>
<td>dat</td>
<td>člověku</td>
<td>člověkoma</td>
<td>ljudmí</td>
</tr>
<tr>
<td>inst</td>
<td>člověkom</td>
<td>člověkoma</td>
<td>ljuděh</td>
</tr>
<tr>
<td>loc</td>
<td>člověku</td>
<td>ljuděh</td>
<td>ljuděh</td>
</tr>
</tbody>
</table>

Table 5.3: Paradigm of the Slovene noun člověk 'person'
(data from Priestly 1993: 401)

Corbett and Fraser (1997: 136-137) point out that this shows that syncretism can be asymmetric. The point to note is that the suppletive plural stem is taken up by
the dual paradigm. This is different from the syncretism discussed in Carstairs (1984) where there is a conditioning property, namely the plural, which conditions case syncretism. The Slovene example shows this very well. As the syncretism is between numbers and cannot be conditioned by NUMBER. The astute reader may recall that we argued in chapter two that CASE was ordered after NUMBER, because the latter was the conditioning category for CASE syncretism. Yet table 5.3 appears to contradict this. There are at least two crucial differences. First, and most importantly, syncretism which relies on feature ordering cannot involve suppletive stems, as in the Slovene example. Second, there can be no examples in the language in question where syncretism which results from referrals can involve the total loss of a CATEGORY distinction in the presence of another CATEGORY. In the Slovene example the NUMBER distinction is not lost throughout a particular CASE. In fact, the examples in tables 5.2 and 5.3 ultimately argue for the ordering of NUMBER before CASE. Not only do we need to state that the dual genitive is the same as the plural genitive, but we also need to state that the dual locative will be the same as the plural locative. The important point is that the dual takes the form of the plural in both instances. The most natural way to state this is given in (5.6).

(5.6)
\[
\text{<mor du> } == \text{ "<mor pl>"}
\]

Any extension of the plural will be an extension of the dual, unless the realisation of a particular case in the dual is explicitly stated. We must explicitly state the realisations of the dual nominative, dual accusative, dual dative and dual instrumental. However, the forms of the genitive and locative need not be explicitly stated, as these will be taken over from the plural paradigm. Note that this would not be possible, if we

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5Note the careful wording here. Of course, indeclinables have lost distinction of all categories, but this is not conditioned by a particular category. Note that there is also an implicational chain here. Given our ordering we would claim that CASE distinction must be lost before NUMBER distinction (see section 2.4). If any item were to be found where NUMBER was not distinguished for any CASE, but CASE distinctions were maintained, this would indicate that our approach needs revision. A possible counterexample is the reflexive pronoun *seb'a*. We argue that it uses the singular forms to realise the plural (i.e. this is a question of referral). It is legitimate to argue this on the basis that the morphology of this pronoun is the same as the singular paradigm of the first and singular person, which both have different plural realisations.

6These other realisations in the dual also involve referral-based syncretism within that number.
assumed the opposite ordering of case and number. The Slovene example shows us that syncretism can involve subtle interaction of both referrals and underspecification. However, what is important here is that the number distinction is never totally lost.

Careful consideration of the Russian adjectival data tells us that it meets neither of the criteria for representation of syncretism between masculine and neuter using referrals. First, there are no adjectives, to the best of my knowledge, which have suppletive stems shared between masculine and neuter to confirm that a referral based syncretism is what is required. Even if there were, such an adjective would not carry that suppletion into one number from the other, because there are no examples of endings being shared between the singular and plural for adjectives. Second, the GENDER category distinction is lost throughout the plural. A counterexample which would make our ordering for Russian untenable would be (5.7) in which an adjective has the same stem for all of masculine agreement and the oblique cases in the singular for the neuter, with a different stem in the singular nominative neuter, suggesting that the syncretism between the two genders was referral-based.

(5.7)

\[
\begin{align*}
\langle \text{mor sg nom neut} \rangle &= \text{stem}_1 - 0 \\
\langle \text{mor sg gen neut} \rangle &= \text{stem}_2 - a \\
\langle \text{mor sg nom masc} \rangle &= \text{stem}_2 \\
\langle \text{mor sg gen masc} \rangle &= \text{stem}_2 - a
\end{align*}
\]

As we have shown that gender syncretism in adjectives is the result of underspecification and not of referrals, this now leaves us in a position to determine what facts are actually in competition to be defaults. It should be noted that this ordering of features is kept for both theories of Russian nominal morphology, the one outlined here and the one in the next chapter. As we shall see, the Overextended Ancestor Prohibition forces us to use referrals between singular genitive and singular dative masculine and neuter for one of the adjectival classes, contra to our claim about the ordering of features here. We argue that this is acceptable, if we assume the referrals for the smaller inflectional class. The difference is that theory A in this chapter places it, we believe incorrectly, in the long-form class, and theory B places it in the marginal A-III otcov 'father's' class of adjectives. We claim that theory B is the better one and that the referral there for the A-III class makes predictions that the neuter could behave differently from the masculine, in that it might follow the long-form, while the masculine maintains the noun ending (section 6.4).
5.3 Suffixes in Competition

In section 5.1 we said that we would exclude personal pronouns from our count of inflection classes, because they are a small closed class. This means that we use the three adjectival classes and the four noun classes to determine which realisations are in competition.

As we are considering seven nominal inflectional classes, the theoretical maximum number of separate realisations for a given number and case slot is seven (in a language which fuses number and case). Equally, it could be possible for a single realisation to account for the same number and case combination in all seven classes. Table 5.4 lists the singular realisations which are in competition as nominal defaults. In the 'occurrence' column we give the number of nominal inflectional classes where a particular realisation occurs. The higher the number, the more classes an item occurs in, and the more likely it is to be a default according to the Majority Default heuristic.

As we have argued in the previous section that masculine-neuter syncretism in adjectives arises from underspecification of gender, this means that any realisation of feminine agreement morphology in adjectives will require the specification of this feature, thereby eliminating such realisations as candidates for nominal defaults, because of the OAP. Realisations from noun declensions which assign feminine formal gender are included but are only counted if they occur in a noun inflectional class. Consider the singular instrumental -oj(u) of class II nouns in (5.8 a), and the two possible feature specifications which involve the singular instrumental for adjectives. As we have argued, gender is not included in the morphological paths of nouns. In contrast, it may be included in the morphological paths of adjectives. In (5.8 b) the adjective in question may only occur with a noun which has feminine gender. In (5.8 c) the adjective in question can occur with a noun which is either masculine or neuter. Hence (5.8 c) is underspecified for gender, but (5.8 b) is not.

(5.8)

a. komnat-oj(u)
   room.SG.INST
b. nov-oj(u)
   new-SG.INST.FEM
c. nov-im
   new-SG.INST
As the OAP stops us from counting realisations which contain a gender feature in their morphological paths, this means that the adjectival realisation -oj(u) cannot be counted as a competitor as a nominal default. The only time that -oj(u) may be counted is the one occurrence where it is not specified for gender in its morphological path, namely when it is used for nouns.

So the singular instrumental -oj(u) occurs only once as a feature specification which does not contain a gender feature, and it is only this one occurrence that is taken into consideration in the competition for the nominal default.

<table>
<thead>
<tr>
<th>Realisation</th>
<th>Feature Combination</th>
<th>Occurrence (out of seven)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-i</td>
<td>sg nom</td>
<td>1</td>
</tr>
<tr>
<td>-Ø</td>
<td>sg acc</td>
<td>4</td>
</tr>
<tr>
<td>-a</td>
<td>sg gen</td>
<td>1</td>
</tr>
<tr>
<td>-o</td>
<td>sg gen</td>
<td>1</td>
</tr>
<tr>
<td>EVAL</td>
<td>sg gen</td>
<td>6</td>
</tr>
<tr>
<td>-u</td>
<td>sg dat</td>
<td>1</td>
</tr>
<tr>
<td>-ovo</td>
<td>sg dat</td>
<td>2</td>
</tr>
<tr>
<td>-a</td>
<td>sg dat</td>
<td>3</td>
</tr>
<tr>
<td>-i</td>
<td>sg dat</td>
<td>2</td>
</tr>
<tr>
<td>-mu</td>
<td>sg prep</td>
<td>3</td>
</tr>
<tr>
<td>=prep</td>
<td>sg prep</td>
<td>2</td>
</tr>
<tr>
<td>-im</td>
<td>sg inst</td>
<td>3</td>
</tr>
<tr>
<td>-om</td>
<td>sg inst</td>
<td>2</td>
</tr>
<tr>
<td>-oj(u)</td>
<td>sg inst</td>
<td>1</td>
</tr>
<tr>
<td>=gen</td>
<td>sg inst</td>
<td>1</td>
</tr>
<tr>
<td>-om</td>
<td>sg prep</td>
<td>3</td>
</tr>
<tr>
<td>=gen</td>
<td>sg prep</td>
<td>3</td>
</tr>
<tr>
<td>-e</td>
<td>sg prep</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 5.4: Realisations in competition

Information from table 5.4 will be used as a guideline to determine where to place certain facts. It is crucial to note at this point that the singular dative and singular genitive realisations -u and -a score highest among the candidates for those feature specifications, because of the existence of the adjectival class A_III. In chapter six we shall not count class A_III for the purposes of determining defaults, as we argue that it does not account for a large number of adjectives. In addition, choosing -u and -a as nominal defaults for singular dative and singular genitive leads us into conflict with the claims we made in 5.2 about feature ordering and the dependency of gender on number and case.
5.4 The Russian Nominal Hierarchy

Let us assume for the time being that there are the following nodes in the hierarchy of nominal morphology, represented as a diagram in figure 5.1. Our next task is to decide which facts go where and whether we need to add further nodes.

![Diagram of nominal hierarchy]

The terminal nodes correspond to the inflection classes in table 5.1 and appendix II. The node MOR_NOMINAL is for facts that may be stated about the morphology of nominals.

First, we decide what the default realisation for the singular nominative of all nominals is. From table 5.4 it is clear that the majority exponent of the singular nominative is the bare stem. We shall therefore assume that there is a fact declared at the node MOR_NOMINAL that the singular nominative is the bare stem. Next, as argued by Corbett and Fraser (1993), there is an evaluation of information to determine the singular accusative for all inflections except N_II. A fact stating that there is an evaluation of information for the singular accusative should also go at the MOR_NOMINAL node.

Whereas the defaults for the singular nominative and singular accusative appear to be clear-cut, the difference between the three choices for singular genitive and singular dative is not so great. Indeed, were it not for class A_III, each choice would be evenly represented. The existence of class A_III adjectives forces the decision for the -a realisation of the singular genitive, as this means that it is the majority realisation for the \text{<mor sg gen>} feature specification. The default fact at the node MOR_NOMINAL for the singular genitive is that it will be realised by the suffix -a. The default realisation of the singular dative will be -u, again because of the existence of the adjectival class A_III. Recall that this is one of the defining characteristics of theory A, and that the presence of these two defaults for singular
The singular instrumental default should be \(-im\), as it is shared by all the adjectival classes and beats the candidate \(-om\) of classes N_I and N_ IV. On the other hand, the realisation of the singular prepositional cannot be decided, as there are two candidates which score equally. Furthermore, they are both direct realisations, so the referrals beat affixes heuristic does not apply.

Referring back to table 5.1, we see that the plural nominative for nominals as a whole is quite clearly \(-i\). The plural accusative shares the evaluation of animacy that all nominals have. If we state that the 'theme vowel' for the adjectival classes is \(-i\) and for the noun classes is \(-a\), then the plural dative, plural instrumental, and plural prepositional are indisputably nominal realisations, as they are shared by all classes.

Finally, the plural genitive is stated as a referral to the plural prepositional. This captures the identity of the two combinations in all of the adjectival classes, including the third person pronouns. It also captures the identity of the plural genitive with the plural prepositional for the non-third person pronouns (e.g. nas is the plural genitive or plural prepositional of 'us'.) Note that the referral is preferred here rather than a default statement which says that the value for \(<\text{mor pl}>\) is a combination of the stem, theme vowel and the ending \(-x\). This would fail to capture the identity of the two feature combinations in the non-third person pronouns. Note that the first and second person pronouns otherwise follow the nouns in the realisation of morphosyntactic combinations, and indeed have controller gender, but not target gender.

5.5 Adding Nodes

The MOR NOMINAL node which would arise from applying the heuristics is given in (5.9).

(5.9)

\begin{verbatim}
MOR NOMINAL:
\langle mor sg nom \rangle == \"\langle stem \rangle\"
\langle mor sg acc \rangle == EVALUATION
\langle mor sg gen \rangle == \"\langle stem \rangle\" \_a
\langle mor sg dat \rangle == \"\langle stem \rangle\" \_u
\langle mor sg inst \rangle == \"\langle stem \rangle\" \_im\n\end{verbatim}

We could treat the singular instrumental as a referral to the plural dative. It should be noted that the referral would have to be in this direction, as the plural dative of nouns, namely \(-a-m\) would not be obtainable if the plural dative referred to the singular instrumental. Indeed, this interesting referral is feasible, if it is stated as true of adjectives only, and would involve singular referring to plural. a
The node MOR NOMINAL is in agreement with the OAP, because there is no left-hand
path which is extended by a GENDER feature, as shown in (5.9). Recall that
the principle of Generalisation Violation states, in simplified terms, that no more than
one fact may be overridden by a daughter. If we take the facts stated as nominal
defaults in (5.9) and assume the hierarchy in figure 5.1, where there are no nodes
intervening between the nominal node MOR NOMINAL and the inflectional class
nodes, then there will be identities for Generalisation Violation wherever a class has
realisations which are not the same as the nominal defaults in (5.9). In table 5.5 we
repeat the endings given in table 5.1, leaving out those for the personal pronouns,
which do not constitute separate inflectional classes, and we shade those cells where
the realisation for the particular inflection class overrides the nominal default in
(5.9).  

---

8As Generalisation Violation may only apply to feature specifications of equal specificity, and we
have ruled out feature specifications containing a fem feature at the node MOR NOMINAL, only the
underspecified (masculine or neuter) affix is included in the part of the table for adjectival morphology.
This is why the singular nominative cell for A I 'long-form' adjectives contains n/a 'not applicable', as
the singular nominative masculine and neuter also have unique realisations. With A II and A III it is
also true that the singular nominative neuter is different from the singular nominative masculine. As in
this instance the singular nominative masculine is realised by the stem itself, we treat this realisation as
resulting from the nominal default for singular nominatives as a whole.

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For the singular nominative of any adjectival declension there can be no contravention of Generalisation Violation, because each of the paths which specify the singular nominative must be extended by a GENDER feature. Hence there can be no identity between the paths at MOR_NOMINAL and the paths at each adjectival declension node.

According to Generalisation Violation the maximum number of path identities allowed between a mother and a daughter is one. In table 5.5 N_I has two, N_II has six, N_III has four and N_IV has four realisations which involve overriding nominal defaults in (5.9). As Generalisation Violation is defined over mother-daughter relations, rather than hierarchy relations, introduction of a node between MOR_NOMINAL and the noun declension nodes would lead to satisfaction of Generalisation Violation. The Principle of Paradigmatic Information Addition permits a node between MOR_NOMINAL and the noun classes, because there is information that can be placed at such a node. Furthermore, we may informally assume that the cost is reduced of introducing morphological nodes which correspond to particular syntactic classes, represented by nodes in the lexemic hierarchy. Hence, because there is a NOUN node in the lexemic hierarchy the introduction of a MOR_NOUN node is legitimated, or at least 'low cost'.

What information could be placed at the MOR_NOUN node? First, as we have placed information about the default morphology of both nouns and adjectives at MOR_NOMINAL, we should not expect to override much of that information.

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9 Greville Corbett (personal communication) suggested this argument to me.
Indeed, Generalisation Violation more or less prohibits this. The one fact that could be overridden from MOR_NOMINAL is the default generalisation that the plural genitive is the same as the plural prepositional. Following earlier work (Corbett and Fraser 1993; Brown and Hippisley 1994) we claim that there is a default plural genitive for nouns which requires the evaluation of the stem hardness to determine whether a noun has the soft plural genitive ending -ej. The hard stem ending -ov is specified at the N-I node and the evaluation shared by N-IV and N-II requires a network relation between the two (see Brown and Hippisley 1994). The fact at MOR_NOUN which states that there is such an evaluation for the plural genitive contains a path on its left-hand side of the form <mor pl gen>. This matches with the higher generalisation at MOR_NOMINAL, thereby providing the one allowed Generalisation Violation identity.

We are now left with a choice. As we have only applied heuristics to determine which facts go at MOR_NOMINAL, we are allowed to 'lower' certain facts. But we must be aware that it is the presence of these facts which has motivated the setting up of MOR_NOUN on the basis of the Generalisation Violation identities which would exist between MOR_NOMINAL and each individual declension class. Note, however, that the fact that certain facts might descend to an intermediate node does not mean that the Generalisation Violation motivation is not valid. Intermediate nodes are justified by the requirements of the Multiple Intra-hierarchy Network Relations Prohibition on the one hand and Generalisation Violation on the other. Facts cannot descend to the lowest node, if this means that there will be multiple network relations between nodes inheriting from MOR_NOMINAL, as this would be in contravention of the first clause of the Multiple Intra-hierarchy Network Relations Prohibition which states that there cannot be more than one network relation between nodes which share a mother. For example, we are required to say somewhere that classes N-II and N-III share the same realisations of singular genitive and singular dative. If both N-II and N-III inherit from MOR_NOMINAL or MOR_NOUN, then they would contravene the Multiple Intra-hierarchy Network Relations Prohibition if both of these two shared facts about the singular genitive and singular dative were inherited via network relations.

In addition to the default generalisation about the plural genitive we may also state that the singular prepositional is realised by suffixing -e. If we maintain the facts about the singular dative and singular genitive at MOR_NOMINAL, we cannot

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10 For both classes the singular dative is realised by referring to the singular prepositional.
place any facts about the singular dative and singular genitive at MOR_NOUN. If we choose to make the generalisation about the plural genitive at MOR_NOUN, then adding either a statement about singular dative or singular genitive at MOR_NOUN would lead to more than one Generalisation Violation identity, because the default statement about the plural genitive of nominals has already been overridden by MOR_NOUN. More important than this, overriding the singular genitive or singular dative facts at MOR_NOUN with ones about the singular dative and singular genitive of N_II and N_III would undermine the whole reason for having -u and -a as nominal defaults. They could not be inherited by N_I and N_IV, and they would thus be there on the basis of only one class, which is marginal according to our argumentation in chapter six.

The singular nominative suffixes -a and -o are unique realisations at the noun level and therefore should be placed at the individual inflection classes. This leaves only the singular instrumental to be considered. As we have placed the singular instrumental -im at MOR_NOMINAL this means that we should not be able to place -om at MOR_NOUN. We return to this question later and argue that keeping the singular instrumental at the node MOR_NOMINAL is not required once a node for adjectival morphology is introduced. Finally, we need to state that MOR_NOUN states that its theme vowel is -a-, for use in the oblique cases of the plural. The above changes result in the hierarchy in figure 5.2.

![Figure 5.2: Introducing the MOR_NOUN node](image)

The information now to be found in the top two nodes, MOR_NOMINAL and MOR_NOUN, is given in (5.10).
We need to consider the status of the noun inflectional class nodes to see how they fare with regard to the noun and nominal defaults. As Generalisation Violation is stated in terms of the mother-daughter relation, we have only to be concerned with identities between MOR_NOUN and the nodes N_I, N_II, N_III and N_IV which currently inherit from MOR_NOUN directly. N_III is the only noun class which has an identity with the path <mor sg prep>, as its singular prepositional is -i. Although it has to specify its own singular instrumental, this does not involve overriding the other facts stated at MOR_NOUN, and N_III therefore obeys Generalisation Violation. N_IV and N_II must override the default generalisation regarding the plural genitive, but this one identity is allowable under Generalisation Violation.

5.6 Adding the Adjectival Nodes

Having established in 5.2 that feature ordering is the correct way to handle the gender-syncretism in adjectives we set out facts that might need to be stated for the adjectival class A_I in (5.11).
(5.11) contravenes Generalisation Violation, as it has three identities with the higher node MOR NOMINAL. There will also be contraventions of the Multiple Intra-hierarchy Network Relations Prohibition as other adjectival nodes will have to refer to A_I more than once for most of the oblique cases in the singular. It should also be noted that any attempt to reduce such reference to a single network relation by stating that an adjectival node refers to A_I for singular morphology will violate the OAP. 11

We need to set up an intermediate node between the adjectival declensions and MOR NOMINAL in order to satisfy Generalisation Violation and the Multiple Intra-hierarchy Network Relations Prohibition. As an illustration of what we mean we give in (5.12) a ridiculous node A_{II}, which shares all of its oblique realisations with A_I.

(5.12)

\[
\begin{align*}
A_{II} : & \quad \text{MOR NOMINAL} \\
<\text{mor sg nom neut}> & \quad = "<\text{stem}>_{\_}=0 \\
<\text{mor sg nom fem}> & \quad = "<\text{stem}>_{\_}=a \\
<\text{mor sg acc fem}> & \quad = "<\text{stem}>_{\_}=u \\
<\text{mor sg gen}> & \quad = A_I \quad [\text{MINRP}] [\text{GV}] \\
<\text{mor sg dat}> & \quad = A_I \quad [\text{MINRP}] [\text{GV}] \\
<\text{mor theme vowel}> & \quad = A_I \quad [\text{MINRP}] \\
\ldots
\end{align*}
\]

Note that we cannot reduce the facts which refer to A_I, as this would lead to a violation of the OAP, because reducing the number of facts would involve the specification of a left-hand path of the form <mor sg>, which is less specific than the nominal defaults in (5.9) and (5.10), because it does not contain information about case. In addition, (5.12) does not capture the syncretisms which occur within the oblique cases for the feminine, as there is no stipulation of <mor sg prep fem>, and so on. Hence there must be even more paths referring to A_I in a redundant manner and in violation of the MINRP. If the MOR NOMINAL node contained the facts as in (5.10) A_{II} also has two Generalisation Violation identities.

Careful consideration of (5.11) and (5.12) indicates that it is not

---

11 Because such a network relation would look something like A* : <mor sg> \(=\) A_I and this node is in a hierarchy relation with MOR NOMINAL which extends this path. Furthermore, the other adjectival nodes would have to refer to A_I for their theme vowel -i, which would constitute a further violation of the Multiple Intra-hierarchy Network Relations Prohibition.
straightforward to set up a node for the morphology of adjectives generalising over classes A-I and A-II, if the nominal defaults for the singular genitive and singular dative are maintained. This is because two of the Generalisation Violation identities - marked by [C; V1 in (5.11) and (5.12) - are with the nominal defaults for singular genitive and singular dative. It also means, however, that there has to be a node which intervenes between these two classes and the MOR NOMINAL node to eliminate these Generalisation Violation identities. This node should also eliminate the violations of the MINRP for A-II in (5.12). In sum, our principles show that there is a conflict between what is true of most adjectives (i.e. the realisation of \(<\text{mor sg gen}>\) and \(<\text{mor sg dat}>\) as -ovo and -omu by classes A-I and A-II) and what is true of most nominals (i.e. that \(<\text{mor sg gen}>\) and \(<\text{mor sg dat}>\) are realised as -u and -a in the largest noun class N-I and the third largest N-IV, together with a small number of adjectives of the A-III class). This conflict is summed up in table 5.6, which is based on figures from Ilola and Mustajoki (1989) and Brown et al. (1996).

<table>
<thead>
<tr>
<th>Realisation of (&lt;\text{mor sg gen}&gt;) and (&lt;\text{mor sg dat}&gt;)</th>
<th>Total for Nouns</th>
<th>Total for Adjectives</th>
<th>Total for Nominals</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a / -u</td>
<td>26,456</td>
<td>68</td>
<td>26,524</td>
</tr>
<tr>
<td>-ovo / -omu</td>
<td>(523)</td>
<td>20,514</td>
<td>21,037</td>
</tr>
</tbody>
</table>

**Table 5.6: The conflict between nominal default and adjective default\(^{12}\)**

\(^{12}\)The figures for this table have been obtained as follows: the total of -a/-u for nouns results from adding the figures for classes N-I (20,690) and N-IV (5,766) given in Brown et al. (1996); the total of -a/-u for adjectives is the figure given in Ilola and Mustajoki (1989: 137) for possessive adjectives with a stem ending in -ov; the total of -a/-u for nominals is the sum of the total -a/-u for nouns and adjectives: the figure in brackets of -ovo/-omu for nouns is the sum of the figures in Ilola and Mustajoki (1989: 13) for masculine and neuter nouns which have an adjective declension; the total -ovo/-omu for adjectives is the number of declinable qualitative and relational adjectives (20,263) given in Ilola and Mustajoki (1989: 106) plus the number of non-ov possessive adjectives (251); the total -ovo/-omu for nominals is the sum of the figure in brackets for nouns and the figure for adjectives. It should be noted that the figures for N-I and N-IV in Brown et al. (1996) are not the same as the figures for masculine and neuter nouns in Mustajok and Ilola (1989), although they are based on information in Ilola and Mustajoki (1989) and checking the electronic version of Zaliznjak (1977), on which Ilola and Mustajoki (1989) is based. For instance, the figures for masculine and neuter nouns would include those with an adjectival declension. These must be excluded from the count for N-I and
From table 5.6 it is clear that we would wish to say of adjectival classes as a whole that their realisations of the singular dative or singular genitive (underspecified for gender) are -ovo and -omu respectively. Although the realisations -a and -u account for the greater number of nominals, this is because of the large number of nouns which take these endings. It might still be legitimate to keep -a and -u as nominal defaults, if there were no separate node for adjectival morphology, but it appears that we have to introduce such a node to generalise the large amount of information that adjectival classes share and avoid violation of the MINRP. In this chapter we shall maintain -a and -u as nominal defaults and go on to show that this means we also come into conflict with our principle of feature ordering and make the A_III class of adjective appear much more typical than table 5.6 suggests is actually the case. A consequence of this is that theory A also groups noun classes N_II and N_III together under a special node N_AI, as we see in section 5.7. In chapter six we shall see that the preferred theory B does not treat -a and -u as nominal defaults, and as a consequence N_I and N_IV must share their morphology by inheriting from a node N_O. Hence, the existence of valid noun classes such as N_O or N_AI is dependent on which nominal defaults one has and what is considered to be typical adjectival inflection.

As classes A_I and A_II have Generalisation Violation identities with the higher MOR_NOMINAL node we require that a MOR_ADJ node be set up, but that it cannot contain facts about the singular dative or singular genitive, as this would repeat the problem with A_I and A_II. If we consider class A_III adjectives, it becomes clear that there are no Generalisation Violation identities, but a massive violation of the Multiple Intra-hierarchy Network Relations Prohibition, as illustrated in (5.13).

N_IV (i.e. the -a and -u endings) and included in the figures of either nouns or adjectives with the -ovo and -omu endings, as we have done.

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In order for the violations of the Multiple Intra-hierarchy Network Relations Prohibition by A_{II} and A_{III} to be eliminated a node must be set up which generalises over A_{I}, A_{II} and A_{III}. Setting up this node will eliminate the Generalisation Violation identities between MOR NOMINAL on the one side and A_{I} and A_{II} on the other. As mentioned in our discussion of the conflict between the default for nominals and the default for adjectives, the singular dative and singular genitive facts for A_{I} and A_{II} cannot be promoted to the node MOR ADJ, as this would lead to Generalisation Violation with MOR NOMINAL. This means that A_{I} and A_{II} still contravene the Multiple Intra-hierarchy Network Relations Prohibition, because A_{II} refers to A_{I} twice for the realisation of the singular dative and singular genitive and both nodes share a mother.

Applying the majority default heuristic for the adjectival declensions alone would lead to the adoption of the formatives -ovo and -omu for the singular genitive and singular dative at MOR ADJ. This has already been discussed with regard to table 5.6, although there we were talking about the absolute number of adjectives with the -ovo and -omu realisations, whereas the majority default is a heuristic based on the number of inflection classes the realisations occur in. As we shall see shortly, ignoring the generalisation about the default realisation for singular dative and singular genitive of adjectives leads us to state redundantly that the neuter will be the same as the masculine for the singular genitive and singular dative of long-form adjectives, because the Overextended Ancestor Prohibition does not allow a less-specific feature specification at a lower node, and the default specification of singular genitive feminine and singular dative feminine at the node MOR ADJ would be more specific than the underspecified stipulation of singular genitive or singular dative at a lower node for long-form adjectives (under theory A). In chapter six we shall argue that the referral-based syncretism between masculine and neuter in the singular genitive and dative is actually what we would wish to say about the sparsely represented class A_{III}, and this follows in theory B where -a and -u are not nominal defaults.
So, we could demote the singular dative and singular genitive endings from MOR_NOMINAL. Taking this decision has far-reaching consequences, as the singular genitive and singular dative endings -a and -u would then be demoted to MOR_NOUN. As N_II and N_III specify different singular genitive and singular dative endings, there would be more than one Generalisation Violation identity between them and the node MOR_NOUN. The singular genitive and singular dative -a and -u would then have to be further demoted to N_I and N_IV, but would then lead to violations of the Multiple Intra-hierarchy Network Relations Prohibition. as N_I and N_IV would have a common mother, MOR_NOUN, and be connected by more than one network relation in order to share this information. A node N_O would be set up to share this information, which is the alternative more adequate theory (theory B) that we consider in chapter six. Maintaining singular genitive -a and singular dative -u as nominal defaults is incompatible with the N_O class, but is compatible with having the N_AI class which generalises over N_II and N_III.

So far we have seen that the adoption of -u and -a as nominal defaults means that there would be Generalisation Violation identities with the realisations for singular genitive and singular dative which are found with the majority of adjectives. Hence there is a conflict between what is general for nominals and what is general for adjectives. This conflict need not be important, if it were true that there were no recognisable morphological class of adjectives, but we have already seen for (5.11) and (5.12) that such a class (node) is required to generalise the facts that all adjectives share with regard to the realisation of the feminine oblique cases in the singular. If there is a conflict between the nominal defaults for singular dative and singular genitive and two adjectival classes, and if it turns out that our principles require that there be a morphological class of adjectives, as they do, then we have to make a decision about whether, within the class of adjectives, what is general for adjectives takes precedence over what is general for nominals. Theory A assumes that what is general for nominals takes precedence.

In order to avoid the MINRP violations we see in (5.12) and (5.13) a node MOR_ADJ is set up and facts which can be shared by A_I, A_II and A_III are placed at the node MOR_ADJ. Maintaining -a and -u as the nominal defaults for singular genitive and singular dative means that there can be no facts at the node MOR_ADJ about singular genitive and singular dative (underspecified for gender). as this will mean two Generalisation Violation identities with the higher MOR_NOMINAL node where the two nominal defaults are stated. As we shall see, this means that we require an additional node to state that classes A_I and A_II share the same realisation of singular dative and singular genitive. The node MOR_ADJ therefore contains the
facts in (5.14).

(5.14)

\[\text{MOR}_{\text{ADJ}}:\]
\[
\langle \rangle \Rightarrow \text{MOR}_{\text{NOMINAL}}
\]
\[
\langle \text{mor sg gen fem} \rangle \Rightarrow \langle \text{<mor sg prep fem>} \rangle
\]
\[
\langle \text{mor sg dat fem} \rangle \Rightarrow \langle \text{<mor sg prep fem>} \rangle
\]
\[
\langle \text{mor sg inst fem} \rangle \Rightarrow \text{N}_{\text{II}}
\]
\[
\langle \text{mor sg prep} \rangle \Rightarrow \langle \text{<stem>} \_\text{om} \rangle
\]
\[
\langle \text{mor sg prep fem} \rangle \Rightarrow \langle \text{<stem>} \_\text{oj} \rangle
\]
\[
\langle \text{mor theme_vowel} \rangle \Rightarrow \_\text{i}.
\]

The treatment of the singular instrumental feminine introduced here is explained in section 5.8. In (5.14) we see that there are a number of realisations which involve the specification of feminine gender. In particular, the paths \(\langle \text{mor sg gen fem} \rangle\) and \(\langle \text{mor sg dat fem} \rangle\) on the left-hand side of facts at MOR_{ADJ}. Note that this means that there can be no paths which are less specific than these at any node which is in a hierarchy relation with MOR_{ADJ}. It should also be noted that MOR_{ADJ} refers to the noun class N_{II} for a realisation of the singular instrumental feminine. This is permitted by clause (iii) of the Intra-hierarchy Network Relations Principle (4.15), because the network relation between MOR_{ADJ} and N_{II} does not involve a left-hand path referring to a right-hand path which extends it.

In order to state that A_I and A_{II} share the same realisations of the singular genitive and singular dative, and thereby to avoid violation of the Multiple Intra-hierarchy Network Relations Prohibition, a node is set up for the shared facts about the singular dative and singular genitive. This node is called A_L as a mnemonic device where the L stands for 'long form'. The node A_L is given in (5.15). An important point to note is the redundancy in (5.15) and the contradiction of our motivation of underspecification based and referral based syncretism. In (5.15) we are required to state separately that the singular dative neuter refers to the singular dative masculine and that the singular genitive neuter refers to the singular genitive masculine. This decision is forced upon us by the Overextended Ancestor Prohibition, as we need to state that the singular genitive feminine realisation is shared by all adjectival declensions at MOR_{ADJ}, and this fact contains a path which would extend a path at A_L not specified for gender.

(5.15)

\[A_{L}::\]
\[
\langle \rangle \Rightarrow \text{MOR}_{\text{ADJ}}
\]
\[
\langle \text{mor sg gen masc} \rangle \Rightarrow \langle \text{<stem>} \_\text{o} \_\text{ovo} \rangle
\]
\[
\langle \text{mor sg gen neut} \rangle \Rightarrow \langle \text{<mor sg gen masc>} \_\text{ov} \rangle
\]
\[
\langle \text{mor sg dat masc} \rangle \Rightarrow \langle \text{<stem>} \_\text{omu} \rangle
\]
\[
\langle \text{mor sg dat neut} \rangle \Rightarrow \langle \text{<mor sg dat masc>} \_\text{ov} \rangle
\]

It now becomes apparent what drastic effects the inclusion of A_{III} as an inflectional
class has on our configuration of the nominal hierarchy. First, it tips the balance in favour of -a and -u as nominal defaults for singular genitive and singular dative. Second, this leads to a conflict between what is true of most nominals and what is true of most adjectives. Third, we are required to state the syncretism between masculine and neuter in the singular dative and singular genitive of class A_I and A_II in terms of a referral when we claimed in section 5.2 that this should be based on the ordering of features in a path. Furthermore, the theory that is being proposed here (theory A) would predict that a simplification of the system would lead to loss of the referrals at A_L, or indeed A_L, thereby leaving A_I and A_II with the same singular genitive and singular dative endings as A_III, N_I and N_IV. However, we know that the historical trend is exactly the opposite (see Garde 1980: 222). The need for the node A_L arises from the attribution of equal status to A_III in determining the defaults for singular dative and singular genitive. As we shall see in the next section, this decision also has dramatic consequences for the noun portion of the hierarchy. So far, we have the hierarchy in figure 5.3.

![Figure 5.3: Introducing the MOR_ADJ node](image_url)

5.7 The Noun Declensions
Recall that the node for noun morphology is as in (5.16). Three facts are stated for noun morphology.

(5.16)
\[
\begin{align*}
\text{MOR_NOUN:} & \\
<> & == \text{MOR_NOMINAL} \\
<\text{mor pl gen}> & == \text{EVALUATION}\ [\text{GV}] \\
<\text{mor sg prep}> & == "\text{stem}" \ _e \\
<\text{mor theme_vowel}> & == \ _a.
\end{align*}
\]

As it stands, the combination of the MOR_NOUN and MOR_NOMINAL node would
yield a noun which had N_I morphology with the exception of the singular instrumental -im. Given that we have not demoted any facts from MOR_NOMINAL and that node gives values for every feature specification except singular prepositional, it is clear that we cannot place any more facts at MOR_NOUN as this would lead to Generalisation Violation identities.

Consideration of N_II and N_III in (5.17) shows that they must violate the Multiple Intra-Hierarchy Network Relations Prohibition in order to share their morphology. We assume here that the value for <mor formal gender> need not be shared.

(5.17)

N_II:
<> == MOR_NOUN
<mor sg nom> == "<stem>" _a
<mor sg acc> == "<stem>" _u
<mor sg gen> == "<stem>" _i
<mor sg dat> == "<mor sg prep>"
<mor pl gen> == EVALUATION
<mor formal gender> == fem.

N_III:
<> == MOR_NOUN
<mor sg gen> == N_II [MINRP]
<mor sg dat> == N_II [MINRP]
<mor sg prep> == "<mor sg gen>"
<mor formal gender> == fem.

Note the violation of the Multiple Intra-Hierarchy Network Relations Prohibition by N_III, because it has more than one network relation with N_II which shares a mother with it. Furthermore, this cannot be overcome by pushing the two shared facts (for the singular genitive and singular dative) up to the MOR_NOUN node, because we encounter the very same problem that arose for the adjectives, namely the Generalisation Violation identities between the singular genitive and singular dative as stated at MOR_NOUN and the nominal defaults for singular genitive and singular dative at MOR_NOMINAL.

Summing up so far, we can see that there is a requirement for a node to be set up to generalise the singular genitive and singular dative realisations that N_II and N_III share, namely -i and the referral to the singular prepositional. Accepting A_III as a valid class of adjective led us to take the endings -a and -u as nominal defaults for the singular dative and singular genitive. This also means that we cannot promote the shared facts regarding the singular dative and singular genitive of N_II and N_III to MOR_NOUN, because this would lead to two Generalisation Violation identities, which is not allowed. So the shared realisations of the singular genitive and singular
The node N_AI generalises three facts, namely the singular genitive, singular dative and formal gender, as in (5.18).

(5.18)  
N_AI:  
<> == MOR_NOUN  
<mor sg gen> == "<stem>" _i  
<mor sg dat> == "<mor sg prep>"  
<mor formal gender> == fem.

The node N_I inherits all of its endings directly from MOR_NOUN, except that it needs to stipulate its singular instrumental and the formal gender that it assigns. The node N_IV, on the other hand, must specify its singular instrumental, its singular nominative and its plural nominative, as well as the formal gender that it assigns. N_IV could specify via a network relation that it inherits its singular instrumental from N_I. This would be the only network relation between the two, and would therefore be legitimate. In fact, we shall demote the singular instrumental -im from MOR_NOMINAL to MOR_ADJ, as there is no need for it to be placed there, if there is a MOR_ADJ node. This thereby allows us to state that the singular instrumental -om is a noun default, as there would otherwise be two Generalisation Violation identities between MOR_NOUN and MOR_NOMINAL (for the plural genitive and the singular instrumental). The attentive reader will have noted that this requires no other modifications to the theory.

Again, it should be noted that the presence of the singular dative and singular genitive endings -u and -a at MOR_NOMINAL has a profound effect on the configuration of the noun portion of the hierarchy, requiring a node N_AI to generalise over N_II and N_III (theory A), in contrast with Corbett and Fraser's (1993) analysis, where a node N_O generalised over N_I and N_IV. In the next chapter we shall go on to claim that accepting a node N_O is preferable and correlates with treating class A_III adjectives as marginal (theory B). The fully blown nominal hierarchy under theory A is given in figure 5.4.
We next consider further generalisations that can be made about adjectives before concluding this chapter.

5.8 The Singular Instrumental and Adjectival Syncretisms

In section 5.1 we claimed that a fact which contained a gender feature could not be a nominal default. This might be considered problematic, if we assume that it is not entirely coincidental that the adjectival classes have a syncretism between the singular dative feminine and singular prepositional feminine, which parallels the syncretism between singular dative and singular prepositional for N-II and N-III (see table 1 in appendix II). The syncretism for N-II and N-III must be referral-based, because the syncretic form differs between class N-II and class N-III. We dealt with this referral for nouns in section 5.7. The class N-III also has syncretism between the singular genitive and the singular prepositional.

As we stated in (5.17) that the singular prepositional of class N-III is the same as the singular genitive, namely the stem and the ending -i, and the singular dative is the same as the singular prepositional for both N-II and N-III. This means that there is syncretism between the singular genitive, dative and prepositional in class N-III. Note that we can say that this syncretism also holds for the realisations of feminine in the singular oblique cases of the adjective, albeit with different forms. However, it turns out that the syncretism between the singular genitive and singular prepositional should not be treated as having the same asymmetry as that for the N-III class. The reason for this is the class of third person pronouns (table 3 in appendix II), where the third person singular genitive feminine form is jejó, but the singular dative feminine and singular prepositional feminine are still syncretic.

In our analysis the third person pronouns are treated as A-II adjectives. If
adjectives in general had the singular prepositional feminine refer to the singular genitive feminine, similar to the referral of singular prepositional to singular genitive for class N_III nouns, we would expect that the third person pronouns should take over jejó in the singular prepositional feminine and, therefore, singular dative feminine. They do not do this, of course. We conclude, therefore, that adjectives have singular dative feminine refer to singular prepositional feminine, aping the noun classes which assign feminine gender, but that singular genitive feminine refers to singular prepositional feminine, an asymmetry which is essentially the opposite of the referral of singular prepositional to singular genitive in class N_III. The referral of the singular genitive to the singular prepositional is overridden in the case of the third person pronouns.

Given the ordering of the gender category last in the morphological path for adjectives and clause (iii) of the Intra-hierarchy Network Relations Principle in (4.15), which states that a network relation between two nodes in the same hierarchy cannot involve a path being paired with its extension, we must state that adjectives can borrow noun realisations, but not the other way round. Note that what is being borrowed here is not a direct realisation, but a referral. We can state that the singular dative feminine for adjectives is realised in the same way as the singular dative for N_AI. This requires that we change one fact at MOR_ADJ in (5.14) to that in (5.19).

(5.19)

\[
\text{MOR_ADJ:} \quad <\text{mor sg dat fem}> == \text{N_AI}
\]

Recall from (5.18) that at N_AI the singular dative refers to the singular prepositional for its realisation. First, the change in (5.19) obeys clause (iii) of the Intra-hierarchy Network Relations Prohibition, because the left-hand path in (5.19) is not extended by the right-hand \textit{path}.\footnote{It should be recalled that \textit{<mor sg dat fem> == N_AI} is an abbreviation for \textit{<mor sg dat fem> == N_AI:<mor sg dat fem>} and \textit{<mor sg prep>}.} Second, as the path \textit{<mor sg dat fem>} extends the path \textit{<mor sg dat>} at N_AI in (5.18) with the gender \textit{feature fem}, so it will extend the path \textit{<mor sg prep>} with the identical \textit{feature}. This means that the adjectival paradigm can make use of the referral at N_AI specifically for realisations involving the feminine only, even though gender is not, cannot, be mentioned anyway in the noun paradigm from which the referral is borrowed. So it is possible to claim that adjectives and nouns share quite abstract patternings in a constrained way. The
adjective can only borrow the referral from the noun, and as this is a property of the morphology, there is no violation of the principle of phonology-free syntax (Pullum and Zwicky 1988: 272-273). Furthermore, this fits with our claim that facts which specify a gender feature cannot be nominal defaults, as the referral at N_AL is referred to by a network relation.

As we have indicated, the syncretism between the singular genitive feminine and the singular prepositional feminine evinces the opposite asymmetry from the one to be found in nouns of the N_III class, and we therefore state that the singular genitive feminine refers to the singular prepositional feminine.

That the singular instrumental feminine in adjectives takes the same form as the singular instrumental of class II nouns (i.e. -oj) is another possible problem for our claim that facts containing a gender feature cannot be nominal defaults. If it happens to be true that all realisations for feminine agreement in adjectives cannot be nominal defaults, then the singular instrumental must be shared by adjectives through a network relation constrained by the principles we have elaborated.

It would appear that adjectives share the singular instrumental feminine realisation with a class which assigns feminine formal gender, namely N_II. However, we must address the apparent facultative use of either -oj or -oju as realisations of the singular instrumental in N_II or the singular instrumental feminine of adjectives and pronouns. Zaliznjak (1977: 65) points out that the -oju variant is more common among the pronouns than it is among adjectives and nouns. However, we treat the pronouns as borrowing either from noun classes (first and second person) or from an adjectival class (third person). As the variant -oj is the same in form as the singular prepositional feminine, singular dative feminine and singular genitive feminine for adjectives, it could be assumed that the singular instrumental feminine in the new system is developing a referral to one of the other oblique cases for the feminine in the singular. This might lead us to assume that nouns would be the last to abandon the -oju ending. However, it is not difficult to find examples where an adjective may have the -oju ending and the noun the -oj ending. It is also possible to find examples where the situation is reversed. Examples (5.20) and (5.21) are taken from Pasternak's Doktor Živago, given in transliteration as they are examples from the

\[\text{14} \text{It has been the writer's experience that a native speaker has spontaneously read out the graphic -oju as -oj in every instance in which it occurred in a text. As the speaker is a young person, this may suggest that this variant is perceived as belonging only to the writing system by younger speakers.}\]
written language.

(5.20)
Ego konečn-oju pružin-oj ostavalos'
his ultimate-SG.INST.FEM spring-SG.INST remained
čuvstvo ozabočennosti ...
feeling.SG.NOM anxiety.SG.GEN
'Anxiety was his mainspring ...'\textsuperscript{15}

(5.21)
... vernulas' v soprovoždenii dvornika s
returned in company.SG.PREP caretaker.SG.GEN with
rogož-eju i bol'š-oj svjazk-oju
matting-SG.INST and big-SG.INST.FEM bunch-SG.INST
krepkoj tolstoj verevki ...
strong.SG.GEN.FEM thick.SG.GEN.FEM string.SG.GEN
'[Lara]... returned, accompanied by the caretaker, with some matting and a
big bunch of strong, thick string ...' (My translation)\textsuperscript{16}

In (5.20) the adjective has the ending -oju and the noun the ending -oj. In (5.21), on
the other hand, the two nouns 'matting' and 'bunch' have the ending -oju - the
appearance of the graphic -eju in the first of the two nouns is a matter of the spelling
system - and the adjective the ending -oj.

Both (5.20) and (5.21) indicate that one cannot easily attribute a directionality
to the choice between -oju and -oj. It appears therefore that there is a facultative
realisation of either -oju or -oj. Our principles would indicate that this facultative
realisation goes with the N_{II} class and that adjectives refer to N_{II} for the realisation

\textsuperscript{15}The translation is that of Hayward and Harari (1987: 22), given in the section of literary works cited.
The example itself is taken from page 24 of the 1989 edition of Doktorživago published by Knižnaja
palata.

\textsuperscript{16}The example is taken from page 82 of the same 1989 edition.
of the singular instrumental. Again, this obeys clause (iii) of the *Intra-hierarchy Network Relations Prohibition*, as the path \( \text{mor sg inst fem} \) is not extended by referring to N-II, but is itself an extension of the path \( \text{mor sg inst} \) at N-II. This means that we state the realisation of singular instrumental at N-II as in (5.22).

\[
\begin{align*}
N_{-II}: \\
\text{\textlangle mor sg inst \rangle} &= \text{"stem"}^{oj/ oju} \\
\ldots
\end{align*}
\]

The import of (5.22) is to say that a noun could choose between the suffixes on either side of the slash. Equally, an adjective which borrows from the paradigm at N-II the singular instrumental feminine realisation can also choose. This enables us to capture the generalisation that there is free choice for both the adjective and noun, and that the presence of one realisation on the noun does not necessarily determine its presence on the adjective.\(^{17}\) It also follows from our treatment that the syncretism which arises between the singular prepositional feminine \(-oj\) and the other oblique cases for the feminine in the singular of adjectives must be accidental. It further follows from our analysis that the singular instrumental at N-II changing from \(-oju\) to \(-oj\) cannot be the result of referral to the adjectival paradigm, as this is ruled out because the referral would involve reference of the path \( \text{mor sg inst} \) to its extension \( \text{mor sg inst fem} \). This syncretism must have arisen from the attrition of the final syllable at N-II. We predict that where \(-oju\) is no longer found in variants of the language, and \(-oj\) takes over, the system could readjust so that the singular prepositional feminine of the adjective paradigm refers to the singular instrumental feminine, which obtains its ending from the noun paradigm.

In sum, we have discussed in this section two possible instances where a fact containing a gender feature might have been considered a nominal default. It turns out that we are able to account for the examples in question. They involve network relations between the adjectival paradigm and the nodes in the noun portion of the hierarchy. Furthermore, they obey the *Multiple Intra-Hierarchy Network Relations Prohibition (MINRP)*, because the network relations are not between sisters, and the *Intra-Hierarchy Network Relations Principle*, which determines that the adjective takes its morphology from the noun, and not the other way round. Both facts can be accounted for in theories A and B. In theory A the singular instrumental \(-oj(u)\) shared

\(^{17}\text{There may be a number of complex factors coming into play which determine the choice of \(-oju\) or \(-oj\). This would be worthy of a corpus-based study.}\)
by adjectives is still specified at the node \textit{N-II} (for class II), and the fact that the singular dative is syncretic with the singular prepositional is stated at the node \textit{N-Al}. In theory B, the latter fact is stated at the node \textit{MOR-NOUN}. In theory A the adjectival declensions refer to \textit{N-Al} for the referral of the singular dative to the singular prepositional. For the reasons given, we must state that the singular genitive feminine refers to the singular prepositional feminine. This leads to a modification of the \textit{MOR-ADJ} node which results in (5.23).

(5.23)

\texttt{MOR-ADJ:}

\begin{verbatim}
<> == MOR NOMINAL
  <mor sg gen fem> == "<mor sg prep fem>"
  <mor sg dat fem> == N-Al
  <mor sg inst fem> == N-II
  <mor sg inst> == "<stem>* _im
  <mor sg prep> == "<stem>* _om
  <mor sg prep fem> == "<stem>* _oj
  <mor theme_vowel> == _i.
\end{verbatim}

As we saw in (5.15) the node A-L inherits from MOR-ADJ in (5.23). Classes A-I and A-II inherit from A-L in turn. Both these classes specify their realisations of the singular nominative and its extensions, as well as the singular accusative feminine, by borrowing from the noun paradigms. When we talk of the 'long-form' class of adjectives A-L this class is not established on the basis of these direct case forms, but rather because of the fact that theory A forces us to set up a node which generalises the singular dative and singular genitive for masculine and neuter.

The predictions that ensue from our configuration of the adjectival portion of the \textit{hierarchy} give us reason to assume that theory B in the next chapter is better justified. An outline of the morphological \textit{hierarchy} for this chapter is given in appendix III at the end of this thesis. The morphological \textit{hierarchy} is incorporated into the full DATR fragment for this chapter in appendix IV. This fragment, which represents theory A, has the same coverage as the one for theory B. That is, it is at least descriptively adequate for the first 1500 most frequent noun lexemes from Zasorina (1977).

\section*{5.9 Conclusion}

In this chapter we have outlined one possible theory of the nominal morphology of Russian allowed for by the Network Morphology framework, theory A. In contrast with theory B in the next chapter, we see that theory A assumes that what is generally true of nominals (that the singular genitive and singular dative are realised by \textit{-a} and \textit{-u} respectively) should take precedence over what is generally true of adjectives (that the singular genitive and dative are realised by \textit{-ovo} and \textit{-omu}.}
respectively). Making this assumption has a number of consequences: first, there is no need to have a node N_O, because the realisations it would generalise over classes N_I and N_IV are stated as nominal defaults; second, as there are realisations of singular dative and singular genitive stated at MOR NOMINAL, Generalisation Violation identities would occur if both realisations of singular genitive and singular dative for N_II and N_III were stated at MOR NOUN, which requires us to set up a node N_AI; third, the singular instrumental -om is a default at MOR NOUN\(^{18}\); fourth, we need to set up a node A_L which generalises over the adjectival class A_I (adjectives such as novij 'new') and class A_II (adjectives such as mam 'in 'mother's'); fifth, we need to state the syncretism in the A_I and A_II class between the singular genitive masculine and neuter, as well as the singular dative masculine and neuter, as referrals contra our argumentation that loss of gender distinction is based on the order of features rather than referrals.

We believe that theory A makes a number of incorrect predictions. A simplification of the adjectival system would involve adoption of the default nominal endings -a and -u for the singular genitive and dative of masculine and neuter adjectives. However, we know this to be against the historical trend. This would mean that the highly marginal otcov 'father's' type of adjective would be expected to grow, contra the intuitions and historical trend. Comparison of theory A and theory B in the next chapter shows that the adoption of N_O as a valid class also means that we must treat the class A_III adjectives (the otcov type) as marginal. We believe that this is an original explicit claim to make.

\(^{18}\)Acquisition data may appear to back this up, if we assume that higher position in the hierarchy is connected with early marking or overgeneralisation. It does not, however, seem that we should always assume this. Similar to the instrumental ending -om in question here, Slobin (1985: 1219) notes for Russian that the class II ending -u can be universally used. This is associated with an operating principle for acquisition which involves one suffix for each case. However, I do not think that we would on this basis wish to claim that -u is the nominal or noun default for singular accusative.
CHAPTER SIX

Theory B

6.0 Introduction

In this chapter we outline a theory of Russian nominal morphology (theory B) which is descriptively equal to theory A, but which is more satisfactory in terms of accounting for our intuitions and the diachronic facts as we know them. Concomitant with this we see that our intuitions about the adjectival system, together with knowledge that the long-form classes A_I and A_{II} are by far the largest, is consistent with our intuitions that the noun classes N_I and N_{IV} go together in a certain sense. So, the constraints of our framework are able to help decide between theories, as they show that our intuitions about one area of the grammar may tie in with our intuitions about another area of the grammar.

In chapter five we saw how the principles of Network Morphology allowed for the configuration of a hierarchy which stated that -u and -a are the default endings of the singular dative and singular genitive for nominals. The setting up of a node N_{AI} which generalised over class II and class III nouns accompanied this decision, because the singular dative and singular genitive realisations for these classes cannot be stated at the noun level, as this would lead to Generalisation Violation identities with the nominal defaults. This approach took what is true of most nominals to be more important than what is true of most adjectives, and had a number of disadvantages. Among them, the contradiction of our claim that syncretism between masculine and neuter in the oblique cases of the adjectives is due to the underspecification of gender, rather than a referral-based syncretism. As a result of this, the prediction would also be made that adjectives might in the future adopt the noun endings -u and -a for the singular dative and singular genitive masculine and neuter, which is contrary to our intuitions and the historical trend.

In this chapter we demonstrate that the alternative theory B leads to a better account of nominal morphology. More specifically, the adjectival class A_{III} is seen to be a marginal class, and the long-form class A_I is seen as the most typical adjectival class. Placing the realisations of the singular dative -u and singular genitive -a at the MOR NOMINAL node would lead to Generalisation Violation contravention, if one wished to state that the long-form class is the general class for adjectives. However, placing the singular genitive -a and singular dative -u at the MOR NOUN node would lead to Generalisation Violation identities with classes N_{II} and N_{III}. A class N_O is therefore required to generalise the sharing of these
realisations by N_I and N_IV. Consequently, the claim that the long-form adjectives
are typical is connected with the view that N_O is a discernible group within noun
morphology.

While we still keep the marginal adjectival class A_III as a separate class to be
dealt with in our theory, section 6.1 shows that there are very few examples of this
class, which indicates that the singular genitive and singular dative endings for class
A_III should not be used in our heuristic for determining a nominal default. This
does not mean that we are doing away with class A_III; it means that counting the
number of classes which share a realisation is problematic when a particular class is
marginal. Remember that the heuristics are not part of our framework. They are just
there to guide in the construction of the network. In sections 6.2 and 6.3 we discuss
the nominal and noun nodes in the morphological hierarchy. Section 6.4 argues for a
configuration of the adjectival portion of the nominal hierarchy which differs from
that in the previous chapter. Section 6.5 shows how our decision regarding nominal
defaults leads us to adopt a node N_O generalising over class N_I and N_IV nouns.
Sections 6.6 and 6.7 are a brief excursus into animacy and stress assignment. In
section 6.8 we show how the pronominal stems fit into the general picture before
comparing theory A with the preferred theory B.

6.1 Suffix competition and A_III

Within Russian linguistics the tradition has generally been to group
decisions I and IV together as one class. An exception to this is the four classes
approach (Karcevskij 1932; Corbett 1982; 1991). Here all classes are treated as
separate and classes I and IV are not grouped together. As mentioned in section 5.1,
Corbett (1982) argues that gender need not be specified in lexical entries, because it
can be predicted either from the inflectional class or from the semantics of the noun,
which need to be specified anyway. It can only be predicted, however, if one adopts
the four class approach.

Criticism of the four class approach is centred on the apparent redundancy
which arises from it. Treating classes I and IV as separate fails to account for their
sharing the singular genitive, singular dative and singular instrumental. In an
approach based on default inheritance this is obviously not a problem, because what
is shared can be inherited from a higher node. In theory A, outlined in chapter five,
this problem of redundancy was overcome, because the singular genitive and singular
dative shared by classes I and IV were nominal defaults, and the singular instrumental
a noun default. However, theory A is obviously not in keeping with the intuitions of
the majority of linguists who have worked on Russian. Furthermore, we see that

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theory A treats the highly marginal A_III class of adjective as central in the adjectival system.

Another way of treating the sharing of morphology by classes I and IV is to set up a *node* N_0 intermediate between the *node* for noun morphology and classes I and IV (theory B). This is what Corbett and Fraser (1993) do. However, they do not elaborate on their reasons for doing this, nor do they set out principles which guide their representation based on the assumptions they have made. In addition, they do not show that theory B is connected with treating class A_III adjectives as marginal. In essence, we shall argue that theory B is a good one and also show the assumptions which lead to the adoption of theory B, of which we outline the noun portion in figure 6.1 (see Corbett and Fraser 1993).

![Figure 6.1: The node N_0 within noun morphology](image)

Viewing Corbett and Fraser's (1993) hierarchy from the top down we see that there are three morphological classes at one level (N_O, N_II and N_III). It should also be borne in mind that this approach states that all classes can be grouped together. Hence, plural morphology can be shared higher up, and, as we shall see, the singular prepositional -e, found in classes I, II and IV, can be shared at the MOR_NOUN *node*. Classes N_II and N_III are also grouped together in the sense that they both inherit from the *node* MOR_NOUN. Loosely, we may interpret figure 6.1 as stating that there is a recognisable morphological class of nouns N_O, whereas there is no such recognisable class for N_II and N_III. This contrasts with theory A which more or less states the opposite.
As mentioned, attempts to generalise about morphological structure by positing less than four inflectional classes usually group together under one class the lexemes which are divided between classes I and IV in the four class approach. The approach based on three classes is the most common approach (some examples are Vinogradov, Istrina and Barxudarov 1953, Isačenko 1968, Gabka 1975, Barnetová et al. 1979, Garde 1980, Švedova et al. 1980 and Halle 1990). The three class approach usually groups classes I and IV together and treats classes II and III as separate.

Two other approaches to the question of structure sharing between Russian declension classes have two declensions. That of Zaliznjak (1967: 205-207) groups classes I, II and IV together and treats III as separate. Stankiewicz (1978: 666-667) treats classes I, III and IV together and II as separate. The point to note from all of the approaches based on three or less classes is that I and IV always occur together. Occasionally, II or III may be placed with them in a two class approach. In both theory A and theory B sharing between any given nominal morphological class is captured by virtue of these classes being part of a default inheritance hierarchy. The real question is whether certain intermediate morphological classes should be set up.

The consensus among Slavists appears to be that there is a need to capture the shared morphology of classes I and IV. Recall that the sharing of the morphology of classes I and IV is also accounted for in theory A, but the shared morphology is treated as a nominal default. What is interesting is that it is not so often considered necessary to capture what is shared by classes II and III. In theory A this was done by the N_AI node. The difference between the information shared by classes I and IV on the one hand and II and III on the other is that the latter share more abstract information. By abstract we mean information that is about patterns rather than direct morphological realisation. For example, for class N_II and N_III the singular dative is the same as the singular prepositional (a referral), and they both assign feminine formal gender, which may determine the behaviour of agreement targets. In contrast, the information shared by classes I and IV is clearly to do with direct realisations, and they do not assign the same formal gender. In contrast again, for the singular of classes II and III only the genitive is a direct realisation which is shared.

While a general consensus among Slavist linguists should perhaps be heeded, we must bear in mind that the morphology shared by inflectional classes can be shared by adjectives. We believe that none of the traditional accounts of declension

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1 Nesson (1994 a) also surveys the different approaches to the number of noun classes in Russian.
classes address this question. The Network Morphology approach to this question is far more ambitious than determining only how noun classes are related. Furthermore, we have seen that plural morphology is more or less shared by both nouns and adjectives, with the exception of the plural genitive. Hence, within the more sophisticated approach we adopt here, the consideration of which classes are related depends on the level at which one considers it. For instance, Slavists who have argued for a grouping of class I and class IV have not sought to explain the relationship that this has with the use of the -u and -a endings in the singular dative and singular genitive of class A_III adjectives. Yet, as we have seen in the previous chapter, this turns out to be very important. If class A_III adjectives have these endings because singular genitive -a and singular dative -u are defaults for nominals, then there is no need to group class I and IV together at the level of nouns. They get these endings because they are noun declensions, and classes II and III have to override this. This is essentially what theory A says. If one adopts an approach in which classes I and IV are grouped together at the noun level, theory B, then one thing our framework makes clear is that there should be a concomitant expectation that the A_III class is minor. Network Morphology makes us see the question in a new and exciting light and forces us to confront the issue by taking into account a much wider range of related morphology. Unlike other approaches it shows that the assumptions made about the adjectival system have far-reaching effects in how we see the declension classes.

In table 5.6 in the previous chapter we showed that there is a conflict between the majority realisation for singular genitive and singular dative of nominals and the majority realisation for these combinations for adjectives. A decision is required about what to do with regard to this conflict. First, we must still include A_III in our account of nominal morphology. Second, we shall exclude the realisations from the count for the heuristic which decides the nominal default. Recall that the heuristics are not part of the framework. They just guide us in making hypotheses about possible hierarchies. So we shall exclude the realisations in class A_III for the count when we make a hypothesis about the nominal default, but the resulting theory will still include it as a valid class. According to Zaliznjak (1977: 63) the A_III type is little used, and figures from Ilola and Mustajoki (1989: 136-137) based on Zaliznjak's dictionary bear this out. There are 251 adjectives of the A_II type, and 69 of the A_III type in the dictionary. 2

2Ilola and Mustajoki (1989: 136-137) say that there are 191 adjectives ending in "я" (59.7% of all possessive adjectives), 60 ending in "яя" or "я" and 68 ending in "п", "п". Including the adjective
Consideration of data from the Uppsala corpus (Lönngren 1993) gives very strong support for not using A_III for the heuristics which help us to hypothesise about possible hierarchies. Table 6.1 has been compiled by using a concordance tool to check for token occurrences of the lexemes listed in Zaliznjak. Note that in the Uppsala corpus, which contains about one million running word tokens, there are only 38 occurrences of the A_III type adjectives listed in Zaliznjak (1977).

<table>
<thead>
<tr>
<th></th>
<th>Class A_II</th>
<th>Class A_III</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rib 'ij type</td>
<td>mam 'in type</td>
<td>total for A_II</td>
</tr>
<tr>
<td>Figures</td>
<td>537</td>
<td>84</td>
<td>621</td>
</tr>
<tr>
<td>Percentage(^3)</td>
<td>81%</td>
<td>13%</td>
<td>94%</td>
</tr>
</tbody>
</table>

**Table 6.1:** Token frequency in Uppsala Corpus of possessive adjectives listed in Zaliznjak (1977)

It can also be seen from table 6.1 that adjectives of the class A_II (combining the rib 'ij and mam 'in types) appear to be much greater in number than the A_III class. Furthermore, the lexeme tret 'ij 'third' accounts for 262 (257 according to Lönngren) occurrences. That means that this one adjective accounts for 42% of all tokens in the Uppsala corpus of the A_II adjectives listed in Zaliznjak (1977). The important point to note is that there are only 38 examples in the whole corpus of adjectives which

\[\text{gospöden}'\] that makes 320 possessive adjectives in total. It is interesting that there are less adjectives of the mam 'in type than of the otcov type. However, the mam 'in type are grouped with the rib 'ij type in class A_II, and they therefore actually belong to a larger class than the otcov type. In fact, grouping the mam 'in type and the rib 'ij type together means that class A_II accounts for 78.4% of all possessive adjectives. Another important point to note is that Zaliznjak (1977) cannot give an exhaustive list of adjectives which belong to A_II as this can productively apply to any name which belongs to declension N_II. Including figures for the A_II adjectives formed from names would emphasise further that the A_III class is marginal.

\(^3\)Strictly speaking, a percentage should not be expressed, as it is a possibility that the classes could differ in the proportion of new lexemes in the corpus which are not found in Zaliznjak. In fact, although this table is based on the list from Zaliznjak, two new possessive adjectives were found in the corpus: staruškin (two occurrences) and possibly pastušičij (one occurrence). These were encountered when looking for the related lexemes pastušij 'shepherd's' and staruxin 'old woman's' in the corpus. It remains only conjecture, of course, to comment on the fact that these new items belong to the most populous class. The reader should note that these items have not been included in the count in table 6.1.
belong to a class which could have the noun singular dative and singular genitive endings. This strongly suggests that it would be wrong to let these endings be nominal defaults on the basis that they occur in this one poorly represented class. What is more, as table 6.2 indicates, if one excludes proper names, there are no class A_III adjectives in Lönngren (1993: 122-183), which only includes lexemes from the Uppsala corpus which have an absolute frequency of greater than 9.

Table 6.2: Number of possessive adjectives from Zaliznjak (1977) included in Lönngren (1993: 122-183)

<table>
<thead>
<tr>
<th>Class A_II</th>
<th>Class A_III</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>rib'ij type</td>
<td>mam'ın type</td>
<td>total for A_II</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>12</td>
</tr>
</tbody>
</table>

Table 6.2 provides us with further evidence that the A_III class is marginal enough for it to be excluded from the heuristics for determining the default realisation. This does not mean that A_III will not be treated as a separate inflection class, because it can in theory be used with a proper name of a male to form a possessive adjective: P ‘otr -> P ‘otrőv; Iván -> Ivánov etc. This means that A_III has a different status from the closed class of nouns of the im’a type, which cannot be added to.5

Perhaps the most conclusive empirical data against theory A’s reliance on the singular genitive and singular dative endings -a and -u as nominal defaults are those on the total occurrence of the singular genitive and singular dative forms in the corpus. These have also been compiled with the help of a concordance tool and are included in table 6.3.

Table 6.3: Count of long form and short form endings in the Uppsala Corpus for possessive adjectives listed in Zaliznjak (1977)

<table>
<thead>
<tr>
<th>Number and Case</th>
<th>LONG-FORM -ovo/-omu</th>
<th>TOTAL LF</th>
<th>SHORT FORM -al-u</th>
<th>TOTAL SF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>m</td>
<td>n</td>
<td>m + n</td>
<td>m</td>
</tr>
<tr>
<td>sg gen</td>
<td>49</td>
<td>7</td>
<td>56</td>
<td>0</td>
</tr>
<tr>
<td>sg dat</td>
<td>10</td>
<td>14</td>
<td>24</td>
<td>1</td>
</tr>
</tbody>
</table>

4I have excluded the noun Popov from the count, as it occurred as a proper name in the corpus.

5It is important in this regard that A_III does not have any endings which are unique to it and not shared by any other nominal morphological class.
There are, in fact, in the whole of the corpus, only two examples of the noun endings being used with an adjective listed in Zaliznjak (1977). Somewhat surprisingly, one of them appears to be with an adjective of class A_{II} suk\textit{in} 'bitch's'. This example, found in the fourth sub-corpus comes from a literary work by V. Kaverin (1979: 3-20) and is given in (6.1) in transliteration.

(6.1)
\begin{verbatim}
Začem-to ja emu nužen, suk-in-u
why-EMPH I he.SG.DAT necessary bitch-POSS-SG.DAT.MASC
syn-u.
son-SG.DAT
\end{verbatim}

'For some reason or other he needs me, the son of a bitch.'

The phrase sukin sin 'son of a bitch' is really a collocation which does not have the usual status of an adjective noun combination. To what extent the adjective and noun may be separated up is debatable. On the other hand, there is an example of a class A_{III} adjective which has the long-form adjectival ending. This is taken from the second sub-corpus, Solouxin (1987: 130-140), where the character in question is discussing which type of mushroom to buy, again given in transliteration.

(6.2)
\begin{verbatim}
Ili, možet byt’, marinovann-ogo kesar-ev-ogo
or may be marinated-SG.GEN Caesar-POSS-SG.GEN.MASC
griba?
mushroom.SG.GEN
\end{verbatim}

'Or perhaps some marinated Caesar’s [?] mushroom?'

According to the analysis which we develop in this chapter, example (6.2) should be more likely than the collocation example in (6.1). These considerations aside, however, we can see that an approach which rejects -\textit{u} and -\textit{a} as nominal defaults is more than justified by data in which we can find only two examples of either of these endings with an adjective in about a million words of running text. Again, it should be reiterated that we do not discount A_{III} as an inflectional class, and it is included in our theory. It just does not count in the heuristics for determining a nominal default. Eliminating the A_{III} realisations gives us table 6.4.
<table>
<thead>
<tr>
<th>Feature Combination</th>
<th>Realisation</th>
<th>Occurrence (out of six)</th>
</tr>
</thead>
<tbody>
<tr>
<td>sg nom</td>
<td>-ij</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>-∅</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>-a</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>-o</td>
<td>1</td>
</tr>
<tr>
<td>sg acc</td>
<td>EVAL</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>-u</td>
<td>1</td>
</tr>
<tr>
<td>sg gen</td>
<td>-ovo</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>-a</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>-i</td>
<td>2</td>
</tr>
<tr>
<td>sg dat</td>
<td>-u</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>-omu</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>=prep</td>
<td>2</td>
</tr>
<tr>
<td>sg inst</td>
<td>-im</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>-om</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>-oj(u)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>-ju</td>
<td>1</td>
</tr>
<tr>
<td>sg prep</td>
<td>-om</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>-e</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>=gen</td>
<td>1</td>
</tr>
</tbody>
</table>

**Table 6.4:** Realisations in competition excluding A_{III}

Adopting this approach to the A_{III} class means that the oblique realisations in the singular are evenly spread, thereby making it harder or impossible to determine a nominal *default*.

### 6.2 The Nominal Node

As in the previous chapter we shall assume a minimal *hierarchy* in which all nodes, including A_{III}, are connected to a top *node* MOR_{NOMINAL}.\(^6\) Note that our decision regarding A_{III} does not have an effect on the choice of plural morphology to be placed at the MOR_{NOMINAL} *node*. This is indicated by table 6.5 in which we count the plural realisations for each class, excluding A_{III}.

---

\(^6\) As stated, A_{III}'s realisations are excluded from the *Majority Default* heuristic. Of course, A_{III} is still subject to every Network Morphology constraint.
Table 6.5: Plural realisations in competition excluding A_III

Not counting A_III reduces the proportion in favour of plural nominative -i. and makes all choices for the plural genitive equal. Otherwise, there is no difference because the plural accusative and the oblique cases only favour one choice. If one accepts that there is a theme vowel for adjectives and nouns. The net effect of table 6.5 is that the plural choices remain the same as in chapter five, except that the plural genitive is not as easily decideable. In fact, we shall decide for the referral to the prepositional on the basis of the pronouns. The non-third pronouns behave like nouns and have the noun theme vowel -a, yet have syncretism between the plural genitive and plural prepositional, which is clearly referral based, because the realisation of the prepositional plural is different in the non-third pronouns, namely nas 'us' or vas 'you'. We could make appeal to the referrals beat affixes heuristic here, but it is not clear that this applies, as the other forms of the plural genitive are based on the evaluation of information to determine which affix to inherit. This differs from referrals in that it involves information, the evaluation of which is associated with the morphosyntactic combination in question. Hence this could be considered to be closer to straightforward affixal realisation, as it involves the evaluation of form, rather than the more abstract sharing that a referral involves. The above considerations mean that we maintain the same plural nominal defaults as in chapter five.

Returning to table 6.4 we see that the singular facts to be placed at MOR NOMINAL are not the same as in chapter five. The singular nominative -Ø, singular accusative evaluation, and the singular prepositional -e may be stated at MOR NOMINAL, because they constitute the majority realisations. However, the singular prepositional could not be placed at MOR NOMINAL in the previous chapter, because there were two equal candidates. In addition, the referrals beat affixes heuristic tells us that the referral of the singular dative to the singular prepositional may be placed as a nominal default, even though each of the three
candidates for realisation of the singular dative has two occurrences. This means that we could have the following facts at the node MOR_NOMINAL in (6.3).

\[(6.3)\]

```
MOR_NOMINAL:
  <mor sg nom> == "<stem>"
  <mor sg acc> == EVALUATION\(^7\)
  <mor sg dat> == "<mor sg prep>"
  <mor sg prep> == "<stem>_e"
  <mor pl nom> == "<stem>" _i
  <mor pl acc> == EVALUATION
  <mor pl gen> == "<mor pl prep>"
  <mor pl dat> == "<stem>" "<mor theme_vowel>" _m
  <mor pl inst> == "<stem>" "<mor theme_vowel>" _m'i
  <mor pl prep> == "<stem>" "<mor theme_vowel>" _x.
```

The difference between (6.3) in this chapter and the facts which we started out with at MOR_NOMINAL in the previous one is that there are now no values specified for the singular genitive and instrumental, and there is now a value specified for the singular prepositional, and a different realisation specified for the singular dative. In the next section we shall see the effect that this has.

### 6.3 The Noun Node

As the realisations of the adjectival class A_III are not included in the heuristic to decide nominal defaults, there are no nominal defaults for singular genitive and singular instrumental, as there is no candidate which is in the majority.

In table 6.6 the shaded boxes are the Generalisation Violation identities which would exist between the morphological class in question and the MOR_NOMINAL node in (6.3), if the morphological hierarchy consisted solely of these classes with MOR_NOMINAL as their mother. That is, the realisations for the particular morphosyntactic combination for a given shaded box differ from those specified as nominal defaults in (6.3). According to Generalisation Violation no class is allowed more than one shaded box.

\(^7\)Note that we do not state here what EVALUATION is. We state that it is shared by nominals.
### Table 6.6: Generalisation Violation Identities

As every class (column) in table 6.6 contains more than one shaded box, this means that each one is in contravention of the Generalisation Violation principle. The worst offender is class IV, which has four identities. Next, are N_II and A_I with three. Then come A_II, A_III, N_I and N_III with two. We can reduce the number of identities for N_IV and N_II by eliminating the statement that the singular nominative is realised by the bare stem. Instead, in a more sophisticated account we shall say that all morphology defaults to the stem, which enables us to account for indeclinable words. As singular nominative is an extension of an underspecified statement about morphology in general, it will be realised by the bare stem, unless there is a fact which specifies otherwise. Path extension is not the same thing as path identity, and therefore the number of Generalisation Violation identities for N_II and N_IV are reduced by one, which means that all classes except for A_I and N_IV would then have two Generalisation Violation identities.

It should be noted here that N_II and N_IV both have Generalisation Violation identities with nominal defaults which are overwhelmingly true of the other nominal classes: the singular accusative evaluation (N_II); the plural nominative realisation (N_IV). In addition to this, both of these classes, in common with all of the noun classes, also override the default statement that the plural genitive is the same as the plural prepositional. It should be noted that this referral is true of the first and second person pronouns which also have the noun theme vowel in the plural -a- (e.g. nas 'we (gen)', nam 'we (dat)', nam'i 'we (inst), nas 'we (prep)'), and thus this referral should be a nominal default. In sum, N_II and N_IV clearly have Generalisation Violation identities which involve nominal defaults that cannot be demoted. This is a motivation for setting up the node for nouns MOR_NOUN, which eliminates the identities, because it intervenes between the nodes N_II and N_IV on
the one hand and MOR_NOMINAL on the other. As with the previous analysis we also need a node where we may state that the theme vowel for nouns is -a in the oblique cases of the plural.

Once the necessity for the MOR_NOUN node is established, it makes sense to place the facts about the singular prepositional and singular dative in (6.3) at the MOR_NOUN node, because these realisations are common only to nodes which inherit from the MOR_NOUN node. We have already mentioned that introducing morphological nodes which correspond to classes in the lexemic hierarchy is justified to an extent by the fact that these nodes are 'low cost'. The resulting hierarchy can be represented graphically as in figure 6.2.

The information to be found at the MOR_NOMINAL node is the same as that for theory A presented in chapter five, except that there are no nominal defaults for the singular genitive and singular dative. It is given again here in (6.4), together with the MOR_NOUN node. Note the one Generalisation Violation identity in (6.4) with the plural genitive, which would correspond to a shaded box, if we were to represent the node MOR_NOUN in terms of a column in a table.

(6.4)

\[
\text{MOR_NOMINAL:}
\begin{align*}
\text{<mor>} & == "\text{<stem}>" \\
\text{<mor sg acc>} & == \text{EVALUATION} \\
\text{<mor pl nom>} & == "\text{<stem>}" _i \\
\text{<mor pl acc>} & == \text{EVALUATION} \\
\text{<mor pl gen>} & == "\text{<mor pl prep}>" \\
\text{<mor pl dat>} & == "\text{<stem>}" "\text{<mor theme_vowel}>" _m \\
\text{<mor pl inst>} & == "\text{<stem>}" "\text{<mor theme_vowel}>" _m'i \\
\text{<mor pl prep>} & == "\text{<stem>}" "\text{<mor theme_vowel}>" _x.
\end{align*}
\]
Overlooking the lack of a default singular instrumental, the crucial difference between (6.4) and the MOR_NOMINAL and MOR_NOUN nodes in the previous chapter is that there is no default statement about the singular genitive and singular dative at MOR_NOMINAL.

### 6.4 Adding Adjectival Nodes

From figure 6.2 and (6.4) we can see that there is still no intervening structure between the adjectival nodes and the MOR_NOMINAL node. If we take the adjectival classes only we can see the Generalisation Violation identities that they have with MOR_NOMINAL in table 6.7. In fact, it turns out that there is only one identity between an adjectival class and what is stated as a default for nominals at MOR_NOMINAL.

<table>
<thead>
<tr>
<th></th>
<th>A_I 'Long-form'</th>
<th>A_II</th>
<th>A_III</th>
</tr>
</thead>
<tbody>
<tr>
<td>sg nom</td>
<td>n/a</td>
<td>-Ø</td>
<td>-Ø</td>
</tr>
<tr>
<td>sg acc</td>
<td>EVAL</td>
<td>EVAL</td>
<td>EVAL</td>
</tr>
<tr>
<td>sg gen</td>
<td>-ovo</td>
<td>-ovo</td>
<td>-a</td>
</tr>
<tr>
<td>sg dat</td>
<td>-omu</td>
<td>-omu</td>
<td>-u</td>
</tr>
<tr>
<td>sg inst</td>
<td>-im</td>
<td>-im</td>
<td>-im</td>
</tr>
<tr>
<td>sg prep</td>
<td>-om</td>
<td>-om</td>
<td>-om</td>
</tr>
<tr>
<td>pl nom</td>
<td>-ije</td>
<td>-i</td>
<td>-i</td>
</tr>
<tr>
<td>pl acc</td>
<td>EVAL</td>
<td>EVAL</td>
<td>EVAL</td>
</tr>
<tr>
<td>pl gen</td>
<td>-i-x</td>
<td>-i-x</td>
<td>-i-x</td>
</tr>
<tr>
<td>pl dat</td>
<td>-i-m</td>
<td>-i-m</td>
<td>-i-m</td>
</tr>
<tr>
<td>pl inst</td>
<td>-i-m'</td>
<td>-i-m'</td>
<td>-i-m'</td>
</tr>
<tr>
<td>pl prep</td>
<td>-i-x</td>
<td>-i-x</td>
<td>-i-x</td>
</tr>
</tbody>
</table>

**Table 6.7:** Only class A_I has a Generalisation Violation identity

We have set up a node for noun morphology, MOR_NOUN. Putting the realisation of singular prepositional for the nouns at this node means that there is no adjectival node with more than one Generalisation Violation identity with N_I. Is there any reason therefore why a node for adjectival morphology should be set up? The answer to this is that the Multiple Intra-Hierarchy Network Relations Prohibition requires it.
As A_I, A_II and A_III share the same morphology for the feminine 
*extensions* of the singular genitive, singular dative, singular instrumental and singular 
prepositional, they require a *node* which can generalise these *facts* over them. 
Furthermore, these *facts* cannot be placed at MOR NOMINAL as *defaults*, because 
they extend number and case with a gender *feature*, which would mean that the left-
hand *paths* at MOR NOMINAL would be in contravention of the OAP. It should 
also be recalled from chapter five that having these *facts* at a MOR ADJ *node* will 
also mean that there can be no less specific *facts* at *nodes* which inherit from 
MOR ADJ. We saw that this had far-reaching consequences in theory A, where we 
had to more or less abandon the generalisation that masculine-neuter syncretism in 
the oblique cases of the singular is the result of underspecification of gender. In the 
analysis which we present here, we shall see that this is only true of the A_III class.

If we count up the majority *facts* which A_I and A_II share, we end up with a 
MOR ADJ *node* as in (6.5).

(6.5) 

\[
\text{MOR ADJ:} \\
\begin{align*}
\langle > &= \text{MOR NOMINAL} \\
\text{<mor sg gen> } &= \langle \text{stem} \rangle \_ovo \\
\text{<mor sg gen fem> } &= \langle \text{mor sg prep fem} \rangle \\
\text{<mor sg dat> } &= \langle \text{stem} \rangle \_omu \\
\text{<mor sg dat fem> } &= \langle \text{mor sg prep fem} \rangle \\
\text{<mor sg inst> } &= \langle \text{stem} \rangle \_im \\
\text{<mor sg inst fem> } &= \langle \text{stem} \rangle \_oj \ (u) \\
\text{<mor sg prep> } &= \langle \text{stem} \rangle \_om \\
\text{<mor sg prep fem> } &= \langle \text{stem} \rangle \_oj \\
\text{<mor theme vowel> } &= \_i.
\end{align*}
\]

Note that the oblique masculine and neuter endings are also stated at MOR ADJ. 
underspecified for gender. If it is true that they should be underspecified for gender, 
then according to the Network Morphology framework they must be *defaults* for 
adjectives, because there are *defaults* which are specified for feminine gender which 
occur in all of the adjectival classes, and a *fact* containing a left-hand *path* with no 
gender *feature* at a *node* below MOR ADJ would be in violation of the OAP, because 
the gender category would be overextending a lower *path*.

Taking into account the information already at the MOR ADJ *node* in (6.5) 
and the information at the MOR NOMINAL *node* in (6.4) we see that only A_1 needs 
to specify any information about the plural (the plural nominative.) A_II and A_III 
need to specify the singular nominative feminine, singular accusative feminine and 
singular nominative neuter. Along with its singular genitive masculine and neuter. 
A_III needs to specify its singular dative masculine and neuter, which it must obtain
either from N_I or N_IV. Without any intervening nodes between them and MOR_ADJ A_I, A_II and A_III would be as in (6.6).

\[(6.6)\]

\[
\text{A}_I: \\
<\text{> sit} \text{ MOR_ADJ} \\
\text{<mor sg nom masc> == N_I _ij} \\
\text{<mor sg nom fem> == N_II _ja} \\
\text{<mor sg nom neut> == N_IV _je} \\
\text{<mor sg acc fem> == N_II _ju} \\
\text{<mor pl nom> == "<stem>" _ije}.^8
\]

\[
\text{A}_II: \\
<\text{> sit} \text{ MOR_ADJ} \\
\text{<mor sg nom fem> == N_II} \\
\text{<mor sg nom neut> == N_IV} \\
\text{<mor sg acc fem> == N_II.}
\]

\[
\text{A}_III: \\
<\text{> sit} \text{ MOR_ADJ} \\
\text{<mor sg nom fem> == N_II} \\
\text{<mor sg nom neut> == N_IV} \\
\text{<mor sg acc fem> == N_II} \\
\text{<mor sg dat> == N_I \[OAP\] [GV]} \\
\text{<mor sg gen> == N_I. \[OAP\] [GV]}
\]

The treatment of long-form adjectives in (6.6) ends up being very similar to the historical analysis, as the various realisations for the nominative (and singular accusative feminine) involve reference to the appropriate noun declension and the addition of a formative which is more or less identical with what were once the nominative (and singular accusative feminine) of personal pronouns. These then evolved as definiteness markers on the adjective, but have lost this function in Contemporary Standard Russian.

Another important theoretical point to note at this stage is the role of clause (iii) of the Intra-hierarchy Network Relations Principle which, as stated in (4.15), requires that a left-hand path may not be paired with a right-hand path which is its extension. A possibility that this rules out is that nouns could refer to adjectives for the appropriate realisation of the singular nominative, as with the example for class II nouns in (6.7).

---

\[^8\text{It should be noted that the complete DATR representation of the N}_0\text{ analysis represents this realization as a combination of the adjectival theme vowel and the formative _je.}\]
(6.7)

\[
\begin{align*}
\text{N}_{II} & : \\
<> & == \text{MOR_NOUN} \\
<\text{mor sg nom}> & == \text{A}_{II}:<\text{mor sg nom fem}>
\end{align*}
\]

(6.7) is ruled out by clause (iii) of the *Intra-hierarchy Network Relations Principle*, because such reference to an adjectival class involves elimination of information about target gender. Hence, this principle predicts among other things that if there is ever to be identity of realisations between adjectives (targets) and nouns (controllers), then the adjectives must take the noun endings, and never the other way round.

Once the changes to the nodes in (6.6) have been carried out a significant problem remains. That is, A_{III} violates the *Overextended Ancestor Prohibition*. The reason for this is that MOR_ADJ in (6.5) specifies the realisations of \(<\text{mor sg dat fem}>\) and \(<\text{mor sg gen fem}>\), but A_{III} specifies the realisation of \(<\text{mor sg gen}>\) and \(<\text{mor sg dat}>\), both of which are extended by the paths at the higher node MOR_ADJ. The claim arising from the application of the OAP here is that because there is a realisation of the singular dative feminine and singular genitive feminine which applies to all adjectival classes, there should be no realisation of the singular genitive and singular dative which is not specified for (target) gender and which does not apply to all classes of adjectives.

Of course, class A_{III} appears to be a counterexample to this claim, because the realisation of the singular dative and singular genitive is not specified for gender in that it can apply for both the masculine and neuter. In fact, this problem was much worse under theory A, because we ended up having to claim that the masculine and neuter realisations found in the most common class, A_{I}, also involved the specification of gender, contrary to our sound argumentation about the different kinds of syncretism. In this current analysis we see that A_{III} is an isolated class which behaves in an exceptional manner, exactly the kind of thing we would wish to state in a framework which allows us to capture differing degrees of generality.

In fact, the OAP forces us to make detailed predictions about the use of the singular genitive and singular dative of class A_{III} adjectives. As we have seen, there is variability in the use of the A_{III} singular genitive and dative. The solution that is proposed to the OAP violation by A_{III} in (6.6) carries with it a prediction about the behaviour of adjectives of this class in terms of agreement with masculine and neuter nouns. We must use *referrals* to state that the singular genitive neuter is the same as the singular genitive masculine, and that the singular dative neuter is the same as the
singular dative masculine. It is assumed that the neuter refers to the masculine, because the masculine is an 'unmarked' gender distinction (Greenberg 1966: 40). If the directionality of these referrals is correct, then we would expect for adjectives such as kesar'ov in example (6.2), where the long-form ending -ovo occurs with a noun of masculine gender, that this ending also be used with nouns of neuter gender. The directionality tells us that if the masculine changes, then so should the neuter. However, if the neuter changes, the masculine need not, because the masculine does not refer to the neuter. Our corpus data form too small a sample to draw any statistically significant generalisations. However, we can see that there is fluctuation in the use of the -u and -a endings. Furthermore, whereas sukin sin in (6.1) is a set collocation, the example with kesar'ov is not, and this fits with the predictions of our model that the forms with -ovo and -omu should spread to the class A_III.

Further to this, the fact in (6.6) which stated that the singular dative was obtained by network relation from the node N_I is modified to say that the singular dative masculine is obtained from N_I, and the singular genitive masculine from N_I. The singular genitive neuter refers to the singular genitive masculine, and the singular dative neuter refers to the singular dative masculine. The prediction of the difference between neuter and masculine is made on the basis that a simplification of this system would involve loss of the referrals.

Finally, we might decide to try and generalise the information that A_II and A_III share by setting up a node A_POSS, where we state the source of inheritance of the singular accusative feminine and singular nominative neuter. Two considerations speak against this move. First, this node will only state other sources of inheritance. Second, and most importantly, it is ruled out by the Principle of Paradigmatic Information Addition, as the node A_II would consist only of a hierarchy relation with the node A_POSS, as A_POSS would itself inherit exactly the same paradigm as A_II. The adjectival portion of the nominal hierarchy is laid out in (6.8).

(6.8)

MOR_ADJ:
< > == MOR_NOMINAL
<mor sg gen> == "<stem>" _ovo
<mor sg gen fem> == "<mor sg prep fem>"
<mor sg dat> == "<stem>" _omu
<mor sg dat fem> == MOR_NOUN
<mor sg inst> == "<stem>" _im
<mor sg inst fem> == N_II
<mor sg prep> == "<stem>" _om
<mor sg prep fem> == "<stem>" _oj
<mor theme_vowel> == _i.
The adjectival portion of the nominal hierarchy now has the shape of figure 6.3.

Figure 6.3: The adjectival portion of the nominal hierarchy

Note that the use of referrals including gender features for the singular genitive neuter and singular dative neuter realisations in A_III eliminates the two Generalisation Violation identities between MOR_ADJ and A_III in (6.6) and also means that the node is not in contravention of the OAP, because the paths in question, <mor sg gen neut>, <mor sg dat neut>, <mor sg gen masc> and <mor sg dat masc>, are not extended by left-hand paths at the higher node MOR_ADJ. We now have a motivation for the loss of these endings under the N_O analysis. They might contravene both the OAP and Generalisation Violation unless a certain degree of redundancy is introduced. The way to eliminate this redundancy is to adopt the standard endings, as our mushroom example (6.2) demonstrates.
6.5 The Noun Declensions

Having reached decisions regarding the nodes MOR_NOMINAL, MOR_ADJ and MOR_NOUN it is relatively straightforward to place noun declensions. In table 6.8 we shade the Generalisation Violation identities which exist between the node MOR_NOUN as it is in (6.4) and the noun class declensions.

<table>
<thead>
<tr>
<th></th>
<th>N I</th>
<th>N II</th>
<th>N III</th>
<th>N IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>sg nom</td>
<td>-Ø</td>
<td>-a</td>
<td>-Ø</td>
<td>-o</td>
</tr>
<tr>
<td>sg acc</td>
<td>EVAL</td>
<td>-u</td>
<td>EVAL</td>
<td>EVAL</td>
</tr>
<tr>
<td>sg gen</td>
<td>-a</td>
<td>-i</td>
<td>-i</td>
<td>-a</td>
</tr>
<tr>
<td>sg dat</td>
<td>-u</td>
<td>-e</td>
<td>-i</td>
<td>-u</td>
</tr>
<tr>
<td>sg inst</td>
<td>-om</td>
<td>-o(u)</td>
<td>-ju</td>
<td>-om</td>
</tr>
<tr>
<td>sg prep</td>
<td>-e</td>
<td>-e</td>
<td>-i</td>
<td>-e</td>
</tr>
<tr>
<td>pl nom</td>
<td>-i</td>
<td>-i</td>
<td>-i</td>
<td>-a</td>
</tr>
<tr>
<td>pl acc</td>
<td>EVAL</td>
<td>EVAL</td>
<td>EVAL</td>
<td>EVAL</td>
</tr>
<tr>
<td>pl gen</td>
<td>-ov/-ej</td>
<td>-Ø/-ej</td>
<td>-ej</td>
<td>-Ø/-ej</td>
</tr>
<tr>
<td>pl dat</td>
<td>-a-m</td>
<td>-a-m</td>
<td>-a-m</td>
<td>-a-m</td>
</tr>
<tr>
<td>pl inst</td>
<td>-a-m'i</td>
<td>-a-m'i</td>
<td>-a-m'i</td>
<td>-a-m'i</td>
</tr>
<tr>
<td>pl prep</td>
<td>-a-x</td>
<td>-a-x</td>
<td>-a-x</td>
<td>-a-x</td>
</tr>
</tbody>
</table>

Table 6.8: Noun declension Generalisation Violation identities with MOR_NOUN

It should be noted that the shaded boxes in table 6.8 account for matches between the declension in question and the node MOR_NOUN, if we assume that there is no intervening structure between the node for the declension and the node MOR_NOUN. Also, any default stated at MOR_NOMINAL which is overridden by a noun declension will not be shaded, because Generalisation Violation only applies between a mother and a daughter. This is why the plural nominative of class N_IV is not shaded, because the default plural nominative -i is stated at MOR_NOMINAL. Further, we noted in (6.4) that the plural genitive is the only Generalisation Violation identity between MOR_NOMINAL and MOR_NOUN, where MOR_NOUN stated that some kind of evaluation is required for the plural genitive. As pointed out in Brown and Hippisley (1994) and elsewhere the major division into hard and soft variants in the plural genitive is overlaid by other questions of stress placement in classes N_II and N_IV. As the hard-soft distinction is basic in the evaluation of the plural genitive for any declension, we assume that the straight hard-soft evaluation is the default which can be overlaid by other evaluations. This means that the default is the evaluation which gives N_III its plural genitive -ej - as N_III contains only soft-stem nouns - and N_I either -ov for hard-stem nouns or -ej for soft-stem nouns, as this evaluation does not need to make use of stress
information. For this reason, the boxes for the plural genitive of class N_IV and N_II are shaded as these declensions also require evaluation of stress.\textsuperscript{9} This yields (6.9).

\begin{equation}
\begin{align*}
N_{\text{I}}: & \quad \Leftarrow \rightarrow \text{MOR}_\text{NOUN} \\
& \quad \text{<mor sg gen>} = "\text{<stem>}" \_a \\
& \quad \text{<mor sg dat>} = "\text{<stem>}" \_u \\
& \quad \text{<mor sg inst>} = "\text{<stem>}" \_\text{om} \\
& \quad \text{<mor hard pl gen>} = "\text{<stem>}" \_\text{ov} \\
& \quad \text{<mor formal gender>} = \text{masc.} \\
\hline
N_{\text{II}}: & \quad \Leftarrow \rightarrow \text{MOR}_\text{NOUN} \\
& \quad \text{<mor sg nom>} = "\text{<stem>}" \_a \\
& \quad \text{<mor sg acc>} = "\text{<stem>}" \_u \\
& \quad \text{<mor pl gen>} = \text{EVALUATION} \\
& \quad \text{<mor formal gender>} = \text{masc.} \\
\hline
N_{\text{III}}: & \quad \Leftarrow \rightarrow \text{MOR}_\text{NOUN} \\
& \quad \text{<mor sg inst>} = "\text{<stem>}" \_\text{ju} \\
& \quad \text{<mor sg prep>} = "\text{<mor sg gen>}" \\
& \quad \text{<mor formal gender>} = \text{fem.} \\
\hline
N_{\text{IV}}: & \quad \Leftarrow \rightarrow \text{MOR}_\text{NOUN} \\
& \quad \text{<mor sg nom>} = "\text{<stem>}" \_o \\
& \quad \text{<mor sg gen>} = N_{\text{I}} \\
& \quad \text{<mor sg dat>} = N_{\text{I}} \\
& \quad \text{<mor sg inst>} = N_{\text{I}} \\
& \quad \text{<mor pl nom>} = "\text{<stem>}" \_a \\
& \quad \text{<mor pl gen>} = N_{\text{II}} \\
& \quad \text{<mor formal gender>} = \text{neut.}
\end{align*}
\end{equation}

$N_{\text{I}}$ and $N_{\text{IV}}$ share the singular genitive, singular dative and singular instrumental. If the singular genitive, singular dative and singular instrumental of $N_{\text{I}}$ and $N_{\text{IV}}$ are put at one of these nodes, then we would require one of them to refer to the other three times, in contravention of the Multiple Intra-hierarchy Network Relations Prohibition, as we see is the case of $N_{\text{IV}}$ in (6.9). Note that we could obtain all of the correct singular forms for $N_{\text{IV}}$, by stipulating the singular dative and singular instrumental at $N_{\text{I}}$ and setting up an $N_{\text{IV}}$ node such as that in (6.10).

\textsuperscript{9}Formally, we must specify a hard variant for class $N_{\text{I}}$, pairing the realization with the path $\text{<mor hard pl gen>}$, but this does not involve a Generalisation Violation identity with the left-hand path at $\text{MOR}_\text{NOUN}$, because this is $\text{<mor pl gen>}$. 

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This solution is ruled out by the OAP, because there are left-hand paths at the nodes MOR_NOUN and MOR_NOMINAL which extend number with case and gender. The other two solutions are for N_I to be in a hierarchy relation with N_IV, or N_IV to be in a hierarchy relation with N_I. The former configuration, with N_IV as a mother of N_I, would require stipulation of the singular nominative, plural nominative, and plural genitive for N_I. As N_IV stipulates the singular nominative and plural nominative as unique inflections, there would be two identities between it and its daughter N_I, contravening Generalisation Violation. Furthermore, this would not overcome the problem that N_IV has two Generalisation Violation identities with MOR_NOUN (see table 6.8). N_I being in a hierarchy relation with N_IV is therefore ruled out entirely.

If we were to allow for non-branching nodes, we would have to entertain the thought of N_I as mother of N_IV. We know that the evaluation shared for the plural genitive with N_III is the default and that this therefore need not be stipulated at N_I. This means that there would be no Generalisation Violation identity with its putative daughter N_IV, which would have to stipulate a different plural genitive evaluation. N_I has a different 'formal gender' from N_IV and there would be a Generalisation Violation identity with N_IV for 'formal gender', unless the gender were put as a noun default or higher. In fact, although masculine may be the default gender for nouns, it does not make sense to specify this at the MOR_NOUN node, because N_I is the only declension class which assigns masculine gender. The reason why masculine is the default gender for nouns is that N_I has the most nouns.

Even if we wished to allow for non-branching nodes, we would not be allowed to have N_I as the mother of N_IV when stress patterns are taken into consideration, as we find that N_I and N_IV differ in their indexed choices. Table 6.9 is taken from Brown et al. (1996: 90-91), and we have shaded in the choices of stress pattern where they differ in their ranking between N_I and N_IV.

\(^{10}\)N_III shares the evaluation with N_I, because stress plays no role in the assignment of the plural genitive. N_III can only get the soft ending, because it is reserved solely for soft nouns.
If N_I were to be the *mother* of N_IV, this would lead to a number of *Generalisation Violation* identities. The stress priorities are suggestive in that N_I and N_IV share the same stress patterns with differing degrees of popularity for each declension. So, if we take account of stress choices, N_I as *mother* of N_IV would contravene *Generalisation Violation*, as there would be more than just the identity with 'formal gender' alone.

Once it is determined that N_I cannot be the *mother* of N_IV and that N_IV cannot be the *mother* of N_I, then we are forced to set up a *node* which is intermediate between these *nodes* and the *node* for noun morphology. The reason for this is that N_IV has two *Generalisation Violation* identities with MOR_NOUN (see table 6.8) and both N_I and N_IV must generalise the three singular realisations they share in order to conform with the *Multiple Intra-hierarchy Network Relations Prohibition*. Therefore, a *node* N_O is required.

In figure 6.4 we incorporate the adjectival portion of the *hierarchy* and the noun portion, including the *node* N_O. Note that the *nodes* in the noun section of the *hierarchy* have been rearranged in order to accommodate the shared structure of N_I and N_IV.

---

11I am grateful to Andrew Hippsley (personal communication) for suggesting this line of argument to me.
Finally, we may state that N_III refers to N_II for its singular genitive. This is allowed by the Multiple Intra-hierarchy Network Relations Prohibition as this is the only intra-hierarchy network relation between the two nodes. As for the singular dative of N_II and N_III this is a referral to the singular prepositional. The referrals beat affixes heuristic tells us that this ought to be a noun default and it is therefore stated at MOR_NOUN. In section 6.1 we stated that more abstract patternings, such as referrals, should ideally stated at a higher level, in contrast with the more obvious sharing of direct realisations. The noun portion of the nominal hierarchy under the N_O analysis (including the node MOR_NOMINAL) is given in (6.11).

(6.11)
\[
\text{MOR_NOMINAL:} \\
<\text{mor sg nom}> \text{ == "<stem>"} \\
<\text{mor sg acc}> \text{ == EVALUATION} \\
<\text{mor pl nom}> \text{ == "<stem>"}_i \\
<\text{mor pl acc}> \text{ == EVALUATION} \\
<\text{mor pl gen}> \text{ == "<mor pl prep>"} \\
<\text{mor pl dat}> \text{ == "<stem>" "<mor theme_vowel>"}_m \\
<\text{mor pl inst}> \text{ == "<stem>" "<mor theme_vowel>"}_m'i \\
<\text{mor pl prep}> \text{ == "<stem>" "<mor theme_vowel>"}_x. \\
\]

\[
\text{MOR_NOUN:} \\
<> \text{ == MOR_NOMINAL} \\
<\text{mor sg dat}> \text{ == "<mor sg prep>"} \\
<\text{mor sg prep}> \text{ == "<stem>"}_e \\
<\text{mor pl gen}> \text{ == EVALUATION} \text{ [GV]} \\
<\text{mor theme_vowel}> \text{ == }_a.
\]

\[12\text{In theory it would be possible to state that the singular genitive was } -i \text{ at the MOR_NOMINAL node. This would then eliminate the network relation between N_III and N_II.}\]
N_O:
<> == MOR_NOUN
<mor sg gen> == "<stem>" _a  
<mor sg dat> == "<stem>" _u  
<mor sg inst> == "<stem>" _om.  

N_I:
<> == N_O  
<mor hard pl gen> == "<stem>" _ov  
<mor formal gender> == masc.

N_II:
<> == MOR_NOUN  
<mor sg nom> == "<stem>" _a  
<mor sg acc> == "<stem>" _u  
<mor sg gen> == "<stem>" _i  
<mor sg inst> == "<stem>" _oj / _oju  
<mor pl gen> == EVALUATION [GV]  
<mor formal gender> == fem.

N_III:
<> == MOR_NOUN  
<mor sg inst> == "<stem>" _ju  
<mor sg gen> == N_II  
<mor sg prep> == "<mor sg gen>" [GV]  
<mor formal gender> == fem.

N_IV:
<> == N_O  
<mor sg nom> == "<stem>" _o  
<mor pl nom> == "<stem>" _a  
<mor pl gen> == N_II  
<mor formal gender> == neut.

It should be noted that the default fact that the singular dative is the same as the singular prepositional could not be shared by N_II and N_III using a network relation, as these two, which have a common mother MOR_NOUN, would then violate the Multiple Intra-hierarchy Network Relations Prohibition, because they already share the singular genitive in this way.

(6.11) is one of the hierarchy configurations allowed by Network Morphology principles. There are other configurations which would also satisfy them. However, it should be clear that making certain assumption about what are default facts suggests certain hierarchies rather than others. More importantly, we see that accepting A_III as a viable adjectival class and adopting the N_O node are choices which exclude each other. As we have seen from the corpus data, the N_O analysis (theory B) is to be preferred, because of the marginal status of A_III. And because the concomitant choice in adjectival defaults is in keeping with the historical trend. Next, we shall consider animacy, stress and the stems of the pronouns before we go on to compare the two analyses.
6.6 Animacy

Animacy was one of the first issues to be dealt with within the Network Morphology framework by Corbett and Fraser (1993) and we shall not cover that ground in great detail here. We noted in our introduction to this thesis that animacy, a semantic feature, could also be relevant to inflection, contra Scalise (1986: 105). The facts of Russian animacy are well known. Class I (masculine nouns) have their singular accusative determined by animacy. If the noun denotes an animate being which has masculine gender, then the form of the singular accusative will be the same as the singular genitive. Any animate noun in the plural will have its accusative the same as the plural genitive. Any inanimate noun in the plural will have the accusative the same as the plural nominative. Corbett and Fraser also allow, as we do in this thesis, for the evaluation of singular accusative to apply to class IV and class III nouns. As animate masculine nouns do not belong to class III, the singular accusative forms for this class are always the same as the singular nominative. Animate masculine nouns with an augmentative suffix, such as volc'is'c'o 'big wolf' belong to class IV in the singular and class II in the plural, as illustrated by (6.12), taken from Zaliznjak (1977: 74).

\[(6.12)\]

<table>
<thead>
<tr>
<th></th>
<th>sg nom</th>
<th>pl nom</th>
<th>sg acc</th>
<th>pl acc</th>
<th>sg gen</th>
<th>pl gen</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom</td>
<td>volc'is'c'-o</td>
<td>volc'is'c'-i</td>
<td>volc'is'c'-a</td>
<td>volc'is'c'</td>
<td>volc'is'c'-a</td>
<td>volc'is'c'</td>
</tr>
</tbody>
</table>

Because of the possibility of nouns such as volc'is'c'o, which are masculine animate and belong to class IV, the evaluation should be allowed to apply to class IV. Furthermore, there is a further requirement that we state that the singular nominative and singular accusative of classes IV and III are the same - with the exception of examples such as (6.12) - but that the realisations differs between classes IV and III. As there are no animate masculines in class III and few in class IV, the evaluation of animacy also enables us to make this generalisation.

For adjectives the form of the accusative is determined by agreement and the features for gender and animacy are determined by syntax.\(^{13}\) Hence the origin of

\(^{13}\)This could be along the lines of the Control Agreement Principle of GPSG (Gazdar, Klein, Pullum and Sag 1985: 83-94; Borsley 1996: 91-101), although its application to non-verbal categories in English is ruled out there. It is clear that adjectives should come within the remit of the CAP for
'syntactic gender' and 'syntactic animacy' is different for nouns and adjectives, as 'syntactic gender' for adjectives is provided by syntax. This presents a slight problem when trying to model this, as the gender and animacy features cannot be evaluated from the adjective, because they are not inherent. For nouns, inherent gender and animacy have to be evaluated, and this determines the form of the accusative. Any adjective lexeme must stipulate a form for any combination with animate/inanimate and masc/neut/fem, and therefore evaluation is not what is required. Yet we must also state that adjectives and nouns share the same determination of morphology on the basis of the features in question. In order to do this we assume that the top of the lexemic hierarchy contains the fact in (6.13).

(6.13)

\[
\text{NOMINAL:}
\]

\[
<> ==
\]

This fact states that the extension of anything for which no extension is defined will have an empty sequence as a value. Importantly, this means that adjectives will inherit this empty sequence as the value for syntactic gender and animacy. This then means that when an evaluable path requires evaluation of syntactic gender and animacy an adjective will return no value, but instead extend the path with features for which it is queried. In sum, this allows us to stop adjectives providing a spurious inherent value for gender or animacy.

The treatment of animacy presented here differs from that of Corbett and Fraser (1993) and Fraser and Corbett (1995). First, we do not use a variable to generalise over number. Variables are generally taken to be abbreviatory devices, and therefore we can assume that Corbett and Fraser's theory naturally contains two paths expressing how the singular accusative and plural accusative should be realised. Second, although a general declarative and evaluation semantics for DATR has been defined (Keller 1995/1996), this does not include variables. This makes the formal interpretation of our theory more straightforward. Third, and more importantly, the use of the variable in Corbett and Fraser's work makes it appear that there is no real difference between the singular and plural in terms of evaluation. However, there is an important difference. That is, gender plays absolutely no role in the plural in the determination of the form of the accusative, but plays the more important role in the Russian, as they have agreement morphology and are functors in accord with the argumentation of Keenan (1974: 302).
singular, because it rules out the animacy distinction for neuter and feminine nouns. For the plural, therefore, we require that only animacy is evaluated. For the singular, we require that both gender and animacy are evaluated in that order. In addition to this, we also introduce morphological case, analogous to formal gender, and state that the default morphological case is nominative and the morphological case of animates is genitive. The relevant portion of the nominal morphology hierarchy is as in (6.14), taken from the full DATR implementation.

(6.14)

\[
\text{MOR_NOMINAL:}
\]

\[
\langle\rangle == \text{MOR}\_\text{WORD}
\]

\[
\langle\text{mor case}\rangle == \text{nom}
\]

\[
\langle\text{mor case masc animate}\rangle == "\langle\text{mor case animate masc}\rangle"
\]

\[
\langle\text{mor case animate}\rangle == \text{gen}
\]

\[
\langle\text{mor sg acc}\rangle == \text{ACCUSATIVE:}<\text{sg }"\text{<syn gender>}" "\text{<syn animacy}>" >
\]

\[
\langle\text{mor pl acc}\rangle == \text{ACCUSATIVE:}<\text{pl }"\text{<syn animacy}>" >
\]

... 

In (6.14) we also see that there is a statement to the effect that the formal case for masculine animates is the same as the formal case for animate masculine nouns. This is because the singular and plural affect gender and the animate subgender differently. This ensures that it is only the masculine animates which have a singular accusative realised the same way as a singular genitive. Furthermore, this allows us to deal with the third person pronouns by stating that their syntactic gender is always animate, as argued for by Corbett (1980), and by adding facts at a node for pronouns in the lexemic hierarchy which state that the formal case of feminine and neuter animates is the same as the formal case of masculine animates (see the node PRONOUN in appendix VI).

For nouns the syntactic animacy and syntactic gender are determined as explained in detail by Fraser and Corbett (1995). For adjectives there is no inherent syntactic animacy or syntactic gender, and this is stated by (6.13). The query paths for adjectives are set to include animacy and gender and these extend the number category. In this way we are able to state that nouns undergo an evaluation, while adjectives, as functors, bypass it. The ACCUSATIVE node is given in (6.15).
In combination with the facts at MOR_NOMINAL and N_I (6.15) provides the correct forms of the nouns. In addition, as the queries for adjectives extend the singular accusative with gender and animacy features (in that order), and the plural accusative with animacy features, so the singular accusative and plural accusative left-hand paths in (6.14) will be extended by those features. As the evaluations of syntactic gender and syntactic animacy in the right-hand paths paired with the left-hand singular accusative and plural accusative paths at MOR_NOMINAL default to no value for adjectives, because of (6.13), this means that the number features in these right-hand paths will be extended by the gender and animacy features for which the adjectives are queried. Accordingly, these features will also extend either the left-hand paths at ACCUSATIVE in (6.15), and therefore also the evaluable path \(<mor\ case>\) contained within the right-hand paths in (6.15). This means that the appropriate formal case will be inserted in the right-hand path at (6.15) according to which features extend \(<mor\ case>\) at (6.15) and therefore which extensions of \(<mor\ case>\) in (6.14) they match with.

Finally, it should be noted that the location of the fact about the singular accusative at MOR_NOMINAL in (6.14) provides a partial explanation for why the singular accusative evaluation is shared by nominals. The plural genitive default for nouns -ov or -ej gives a Generalisation Violation identity with N_I, which has either nothing or -ej. If the singular accusative evaluation were moved down to MOR_NOUN, this would mean two identities with N_I, in contravention of the principle.\(^{15}\) Note that this correlation is not captured under the N_AI analysis, as the N_AI node intervenes between MOR_NOUN and N_I, which means that Generalisation Violation, as a local principle, could not apply. Under the N_O analysis there is therefore a correlation between the fact that N_I has its own singular accusative and plural genitive and the fact that accusative syncretism is shared by determine whether the lexeme in question were a functor (agreement target) or argument (agreement controller). If a functor, it would be referred to the ACCUSATIVE node, if an argument, it would be referred to a further node for evaluation before being referred to the ACCUSATIVE node. This would capture the fact that the morphology of controllers is determined by inherent properties.

\(^{15}\)This is not conclusive, as the principles allow for other hierarchies.
nominal morphology. In sum, we have an explicit account of animacy which generalises across noun, adjective and pronominal morphology.

6.7 Stress

In section 6.5 we argued that the indexed choices for stress patterns of classes I and IV demonstrated that neither could be the mother of the other. Both full DATR implementations of theory B outlined here and theory A from chapter five include a model of the nominal stress system. Brown et al. (1996) show how the Russian nominal stress patterns can be incorporated into the network of morphological information. They use indices to address inflectional class nodes to the correct nodes in the stress hierarchy given in figure 6.5. The indices are based on the choice laid out in table 6.9.

Figure 6.5: Nominal stress hierarchy

In the analysis presented by Brown et al. (1996) the facts found at the various nodes are as in (6.16). As pointed out in a footnote, there are intra-hierarchy network relations between the daughters and granddaughters of the node STRESS.

16The positioning of nodes is partly determined by the fact that they may have intra-hierarchy network relations.
In section 4.3 we defined the principle of Generalisation Violation in such a way that there could be two path identities between nodes in a mother-daughter relation, but there could only be one identity, if the mother contained only one other fact in addition to its mother-daughter relation with its own mother. In the representation of the stress hierarchy in Brown et al. (1996), given in (6.16), the path <pl> is the only non-empty path at STRESS. As STRESS is the top node of the stress hierarchy, it has no mother-daughter relation with a higher node. The nodes STRESS_B, STRESS_C and STRESS_D also specify an identical path <pl>. They therefore have one path identity each with the node STRESS. Although this is not strictly in contravention of Generalisation Violation, we might wish to change the analysis so that there are no path identities between STRESS and its daughters. The hierarchy should also be modified to accommodate the Hierarchy Identifier Convention introduced in chapter two. We shall introduce the hierarchy identifier stress for this purpose. Finally, we see that making the requirement that there be no path identities between STRESS and its daughters forces us a subtly different analysis of noun stress. In the representation which appears in Appendix VI the stress hierarchy has been altered to satisfy the requirement that there be no path identities
between STRESS and its daughters, and it is also brought into line with the Hierarchy Identifier Convention. (6.16) is therefore changed to (6.17). The most important change in the hierarchy in (6.17) is that the default statement about the singular being the same as the plural has been removed. In fact, this eliminates a redundancy in (6.16), as this fact is essentially stated twice in (6.16), once at STRESS and once at STRESS_B.

(6.17)

\[
\begin{align*}
\text{STRESS:} & \quad <> == . \\
\text{STRESS_B:} & \quad <> == \text{STRESS} \\
& \quad <\text{stress pl}> == <\text{stress sg}> \\
& \quad <\text{stress sg}> == "". \\
\text{STRESS_C:} & \quad <> == \text{STRESS} \\
& \quad <\text{stress pl}> == \text{STRESS_B}. \\
\text{STRESS_D:} & \quad <> == \text{STRESS} \\
& \quad <\text{stress sg}> == \text{STRESS_B}. \\
\text{STRESS_Bi:} & \quad <> == \text{STRESS_B} \\
& \quad <\text{stress pl nom}> == \text{STRESS}. \\
\text{STRESS_Bii:} & \quad <> == \text{STRESS_Bi} \\
& \quad <\text{stress sg acc}> == \text{STRESS}. \\
\text{STRESS_Ci:} & \quad <> == \text{STRESS_C} \\
& \quad <\text{stress pl nom}> == \text{STRESS_Bi}. \\
\text{STRESS_Di:} & \quad <> == \text{STRESS_D} \\
& \quad <\text{stress sg acc}> == \text{STRESS_Bii}. \\
\end{align*}
\]

In (6.17) the role of the node STRESS is to state that the default value for stress is nothing. Given that nouns only require a value for singular or plural, the default statement at STRESS is not required by nouns which take their stress pattern from STRESS_B. However, the node STRESS_B may also define stress for other word classes, such as verbs, where the present tense may have stress on the theme vowel of the ending, but the past does not have ending stress. Such examples can be found in Zaliznjak (1977: 135) under pattern b. The important point to note is that we still wish to say that the singular and plural (of the present) have ending stress, as is the case for STRESS_B. We need to state that the past does not have ending stress,
and this could be accounted for by assuming the hierarchy relation between STRESS and STRESS_B.17

The approach in (6.15) means that we claim that the distinction between singular and plural can only arise when there is ending stress. The statement that singular stress is by default the same as ending stress can only be understood in terms of a potential difference. Hence such a referral is only found at the STRESS_B node. It should also be noted that the indices which are used in the inflection hierarchy to address the appropriate stress nodes also satisfy the principles we have outlined here, as discussed briefly when motivating the node N_O in section 6.5. This approach also has the advantage of reducing the relation between the nodes STRESS and STRESS_D to a straightforward hierarchy relation, whereas STRESS in the approach of Brown et al. (1996) was also set as the "global" node for STRESS_D. This meant that values that were stated by means of indirection markers were provided by STRESS itself. Hence STRESS_D obtained its value for plural stress by inheriting the fact from STRESS that plural stress is the same as singular stress and requiring that this be determined at STRESS. In the current approach STRESS does not specify a value for singular or plural stress but provides nothing as the value, if the value is not specified by nodes which are in a hierarchy relation with it.

6.8 Stems

At the beginning of this chapter it was promised that an explanation would be provided of how the correct pronominal stems are determined for combination with the appropriate inflection. In this section we show how this is done, before we go on to compare the two theories we have outlined in this and the previous chapter.

The third person pronouns follow the adjectival class A_II in their declension. However, there is significant alteration of the stems depending on case. We set this out in table 6.10.

17Only STRESS and STRESS_B can be generalised across word classes, and the other pattern c which Zaliznjak (1977) uses for verbs cannot be equated with pattern c for nouns. One assumption underlying this justification of STRESS_B and STRESS is that the past feature is ordered before NUMBER and GENDER features. Hence <stress past> would be associated with the endings for the past tense and obtaining a value for that path from STRESS_B would involve a default to STRESS. For the present tense <stress sg> and <stress pl> would be associated with the endings and no tense feature involved. This would give the stress defined at STRESS_B.
<table>
<thead>
<tr>
<th>SG</th>
<th>Masculine</th>
<th>Neuter</th>
<th>Feminine</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom</td>
<td>on</td>
<td>on-o</td>
<td>on-a</td>
</tr>
<tr>
<td>acc</td>
<td>(n') j-e-vó</td>
<td>(n') j-ejó</td>
<td></td>
</tr>
<tr>
<td>gen</td>
<td>(n') j-e-vó</td>
<td>(n') j-ejó</td>
<td></td>
</tr>
<tr>
<td>dat</td>
<td>(n') j-e-mú</td>
<td>(n') j-éj</td>
<td></td>
</tr>
<tr>
<td>inst</td>
<td>(n') j-im</td>
<td>(n') j-éj</td>
<td></td>
</tr>
<tr>
<td>prep</td>
<td>n'-óm</td>
<td>(n') j-éj</td>
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<table>
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<th>on-í</th>
</tr>
</thead>
<tbody>
<tr>
<td>acc</td>
<td>(n') j-íx</td>
<td></td>
</tr>
<tr>
<td>gen</td>
<td>(n') j-íx</td>
<td></td>
</tr>
<tr>
<td>dat</td>
<td>(n') j-im</td>
<td></td>
</tr>
<tr>
<td>inst</td>
<td>(n') j-im'i</td>
<td></td>
</tr>
<tr>
<td>prep</td>
<td>(n') j-íx</td>
<td></td>
</tr>
</tbody>
</table>

Table 6.10: The third person pronouns

We shall ignore the question of what to do about the n'- which is used when the pronoun occurs with a preposition. Two important aspects of the third person pronouns have to be captured in addition to their endings. From table 6.10 it can be seen that the plural pronouns have ending stress, as with stress patterns B or C. Equally, it can be seen that the singular of the masculine and neuter also has ending stress. The complication here is that the last syllable of disyllabic endings is stressed, rather than the first syllable, as is the case with the adjectives.

In addition we need to state that the nominative case has its own stem, namely on-. As we have claimed that features are ordered NUMBER-CASE, we must state in the lexical entry for third person pronouns, called on, that the plural nominative stem is the same as the singular nominative with the addition of softening of the final /n/. The fact that the plural nominative involves softening of the final /n/ indicates that it is inappropriate to claim that case is ordered before number for the pronouns, as number is still distinguished between the cases on the basis of softening. Even in the stem, complete number syncretism within a case is still avoided. We then specify the stem shapes j- and n'- as the basic stem for the other case and number combinations.

At the node On in the lexemic hierarchy it is stated that the third person pronoun morphology is the combination of the values from the adjectival morphology node A_II. We can then alter A_II to include possible pronoun stress (stress pronoun) on the final syllable, which is only defined for the third person pronouns. Although stress is strictly speaking lexical, or rather lexemic, in the pronouns, it still occurs on the end. In order for the pronoun not to be stressed on both syllables on the singular ending we define the third person stress pattern as pattern C. Pronoun stress occurs on the final syllable of the singular, where required. In the lexical entry On, the singular vowel is defined as /e/ to account for the occurrence of this vowel in the
feminine realisations of On (e.g. j-e-j'she (singular genitive, dative, prepositional')).

In table 6.11 we set out the stems of the non-third pronouns.

<table>
<thead>
<tr>
<th></th>
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<th>Second</th>
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<tr>
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<td>ja</td>
</tr>
<tr>
<td></td>
<td>acc</td>
<td>men'-á</td>
</tr>
<tr>
<td></td>
<td>gen</td>
<td>men'-á</td>
</tr>
<tr>
<td></td>
<td>dat</td>
<td>mn-é</td>
</tr>
<tr>
<td></td>
<td>inst</td>
<td>mn-ój(u)</td>
</tr>
<tr>
<td></td>
<td>prep</td>
<td>mn-é</td>
</tr>
<tr>
<td>PL</td>
<td>nom</td>
<td>m-í</td>
</tr>
<tr>
<td></td>
<td>acc</td>
<td>n-á-s</td>
</tr>
<tr>
<td></td>
<td>gen</td>
<td>n-á-s</td>
</tr>
<tr>
<td></td>
<td>dat</td>
<td>n-á-m</td>
</tr>
<tr>
<td></td>
<td>inst</td>
<td>n-á-m’í</td>
</tr>
<tr>
<td></td>
<td>prep</td>
<td>n-á-m</td>
</tr>
</tbody>
</table>

**Table 6.11: Non-third person pronouns**

The non-third person pronouns specify the source of inheritance for morphology as the node N_II. All that they then require is for plural prepositional to be specified as being a combination of the noun theme vowel /a/ and /s/. From MOR_NOMINAL they inherit the referral of the plural genitive to the plural prepositional. At the lexemic node NON-THIRD it is also specified that non-third pronouns have an index 2. This means that all of their endings will be stressed. NON-THIRD also inherits from the node N_O its singular genitive. The non-third pronouns inherit their instrumental singular from N_II.

The plural stems of first person and second person are specified as being n- and v- respectively. Note that the first person will need to specify a separate plural nominative stem. This does not create an additional problem, as inflection already needs to refer to a separate plural nominative stem for the third person pronouns and some nouns as well. The singular nominative morphology (not just stems) of both the first person and second person is specified as ja and ti respectively. For the second person the stem is teb- with a special instrumental stem specified as tob-. Inflection needs to make reference to the singular instrumental stem and this means that the specification of singular instrumental at N_II will require reference to the singular instrumental stem.

The singular stem for the first person is mn-. A separate stem for the singular genitive is specified as men'-á. As the singular accusative takes the singular genitive realisation on the basis of animacy, nothing more need be said. The pronoun lexical
entries are included in Appendix XII. and these were also used for theory A. of course.

6.9 Comparison of Theory A and Theory B

In the previous chapter we considered theory A of Russian nominal morphology and saw that it accompanied the assumption that the singular dative (masculine and neuter) and singular genitive (masculine and neuter) morphology of class A_III is a default for nominals. In this chapter we have presented theory B of Russian nominal morphology and shown that it is accompanied by the assumption that the singular dative and singular genitive are not defaults for nominals. Under both theories we also keep the same treatment of the singular instrumental feminine realisation of adjectives as outlined in section 5.8. Furthermore, we treat the syncretism between singular dative feminine and singular prepositional feminine as a network relation between the MOR_ADJ node and the MOR_NOUN node in theory B.

The theory A managed to capture the abstract structure-sharing between the classes N_II and N_III. In addition, it made the claim that the realisation of the singular instrumental -om is a default for nouns. Theory A appears to have a number of disadvantages. In particular, it undermines the general claim that adjectival syncretism between masculine and neuter is not accidental. It makes the prediction that one would expect adjectival morphology to simplify and take -a and -u as realisations for the singular genitive and singular dative of masculine and neuter on the basis of the least general class A_III, which hardly seems a viable choice given the one occurrence of each ending in approximately one million words of running text. It does not state that there is any correlation between the existence of a separate realisation for the singular accusative in class N_II on the one hand and animacy-based syncretism being shared by nouns and adjectives on the other. On another level, it makes the relationship between N_I and N_IV appear more abstract - because the shared morphology is inherited form a higher more abstract class - than the relationship between N_II and N_III. Yet this is clearly not the case, as N_I and N_IV share direct realisations.

Under the N_O analysis there is virtually no singular morphology at the node MOR_NOMINAL. The singular nominative is really the result of a default to nothing. With the exception of the plural nominative (at N_IV) and genitive, it is generally the singular morphology which distinguishes declension classes. So theory B ties in the more obvious sharing of direct realisations in N_I and N_IV with the identifying function that singular morphology has for morphological classes.
As we have seen, traditional approaches to the question of the number of declension classes in Russian have often grouped N_I and N_IV together, but rarely N_II and N_III, mainly because these latter share more abstract structure. Furthermore, the grouping of N_I and N_IV should be explicitly connected with the view that A_III, the otcov class of adjectives, is marginal. In fact, theory B treats A_III as a marginal class, a fact borne out by the data introduced at the beginning of this chapter. Furthermore, if we bring to bear the expectation that moving up the hierarchy involves progressing to more abstract classes, then we should expect more abstract structure sharing to be stated higher up. This is what happens in the N_O analysis, where the abstract structure shared by N_II and N_III is captured in that the fact that the singular dative refers to the singular prepositional is stated at MOR_NOUN, rather than a lower node such as N_AI. On the other hand, N_I and N_IV share direct affixal realisations, rather than more abstract referrals, and these are stated at the node N_O below MOR_NOUN in theory B. Another advantage of the theory B is that it therefore makes a connection between abstract morphological classes and abstract structure.

Theory B predicts that a simplification of the adjectival system would involve the A_III class taking on the long-form endings for the singular genitive and singular dative, -ovo and -omu respectively. The historical development of the A_II class is exactly in accord with this prediction, in that adjectives of this type now have the long-form endings (Garde 1980: 222). Furthermore, theory B claims that any intermediate stage may involve a difference between the masculine and neuter genders. In addition to this, theory B gives us a motivation for the loss of the short-form endings of the A_III class, in that we are required to have referrals in order to avoid contravention of the OAP, and these referrals indicate that there is redundancy in the object language, namely Russian, which can be eliminated by adopting the long-form endings.

In sum, theory B has a number of distinct advantages over theory A. It predicts change in adjectival inflection which we know is in keeping with the historical trends (Garde 1980: 222). It correlates abstract morphological structure with abstract morphological classes. It emphasises the declension-class identifying nature of singular morphology. It involves the claim that it is not accidental that masculine and neuter adjectives share syncretism in the oblique cases and this correlates directly with the existence of the N_O node which N_I and N_IV share. Finally, it leads to the claim that the existence of animacy-based determination of the singular accusative form for nominals as a whole is determined partly by the existence of a separate singular accusative for class N_II.
6.10 Conclusion

In the preceding section we have emphasised the advantages and disadvantages of two different theories that the Network Morphology framework allows for: theory A and theory B. We have concluded that the empirical evidence in terms of historical trends favours theory B and that it accords with our intuitions about what is marginal in Contemporary Standard Russian. Both theory B and theory A have a number of advantages. First, comparing theory B and theory A tells us that there is a connection between treating A-III as marginal and accepting the class N_O as a valid morphological class of nouns. Second, we find that complete neutralisation of gender, as conditioned by the plural for example, makes the sharing of morphology more likely. Third, we saw in section 5.8 for theory A that we could account for the syncretism between the singular dative feminine and singular prepositional feminine in a constrained way by referring to the node N_AI. In theory B we refer to the node MOR_NOUN. In both accounts the network relation involves the pairing of a path with another path which is not its extension. Hence, the adjective can take this syncretism from the noun. Fourth, in theory A we saw that there was a problem for our claim about underspecification and syncretism, because we had to restate the syncretism between the masculine and neuter in the singular genitive and singular dative, because of the existence of a left-hand path at a higher node which would otherwise extend the paths <mor sg dat> and <mor sg gen>. Theory B allowed for such referrals only in the marginal A-III class, and stripping away the referrals would lead to the elimination of the noun type endings -a and -u. Furthermore, under theory B the node A-III refers to N_I and the directionality of the network relation is again determined by the Intra-hierarchy Network Relations Principle, which requires that a left-hand path does not refer to its extension, and combined with the Overextended Ancestor Prohibition, which prohibits the left-hand side path from being extended by a left-hand path at the higher node MOR_ADJ, where there are left-hand paths of the form <mor sg gen fem>. This means that the left-hand path at A-III must contain a gender feature and that therefore the directionality of referral is to the noun node N_I.

In our treatment of the adjectival morphology (singular dative feminine and singular instrumental feminine) and the network relations between A-III and N_I in theory B we are making specific claims about the directionality of sharing. To an extent, we may claim that this morphological directionality is in accord with linguists' intuitions regarding the greater relative dependence of a modifier on a noun when gender is involved. This is mentioned explicitly by Malchukov (1996: 68) in his discussion of Bhat's (1994: 3) claims regarding agreement morphology and greater independence from the head noun. In fact, this accounts for an apparent paradox.
regarding Bhat's claims that such morphology should lead to an underdifferentiation of nouns and adjectives, when this is clearly not true for Russian. It is the presence of gender which is crucial.

We have seen how our intuitions about one marginal area of adjective morphology, the A_III class, can confirm our intuitions about another area of noun morphology, the validity of a partial grouping of class N_I and class N_IV under an N_O class. In part III of this thesis we shall go on to consider the second locative case and show how our ordering of features helps us fit this into the N_O system. So far, we have shown that we can contrast two different theories on the basis of their formal representation and judge that one of them better fits with our informal intuitions, namely theory B.
PART III

THE EXCEPTIONAL AS PART OF THE GENERAL
CHAPTER SEVEN

An Example of Exceptional Morphology: The Second Locative

7.0 Introduction

In the first chapter we argued that the claim that inflection and derivation were sensitive to different semantic features was not as watertight as might appear. We showed that, contra the arguments of Scalise (1986: 105), inflection could be sensitive to the features animate and abstract at least. In section 6.6, building on the work of Corbett and Fraser (1993) and Fraser and Corbett (1995), we showed how animacy is used to determine the form of the accusative in both the singular and plural. In this chapter we look at the second locative which, among other things, is also connected with animacy, as we show in section 7.1. The second locative case is generally considered to be marginal, with the actual number of nouns which have it decreasing over time (Ward 1965: 268; Comrie, Stone and Polinsky 1996: 309), and it has been argued (e.g. by Fowler 1987: 85) that it should not be considered a case. On the other hand, the second locative is a valid 'distributional case' (Comrie 1991: 45), as it is distinguished by more than one noun phrase. We argue here that the second locative is indeed a case and, on the basis of informant work, that claims that it cannot occur in modified noun phrases (Franks 1995: 43 and 58 fn36), except as set collocations or place names, are incorrect. The fact that it can occur in modified noun phrases means we cannot merely list each occurrence of the noun phrase with -ú (or -í in the case of class III nouns) in the lexical entry for a noun. This then sets the stage for chapter eight in which we present a Network Morphology theory of the second locative which places it within our more general N-O theory of Russian nominal morphology, and also gives a partial account of why it cannot be generalised.

As mentioned in section 1.3.2 when discussing the difference between inflection and derivation in regard to the features to which they are sensitive, the second locative has a genuine locative meaning. We gave the example of the noun 
ugol 'corner/angle' where there is a second locative when the noun means 'corner', but not in its abstract mathematical sense of 'angle' (Zaliznjak 1977: 484). This supported our claim that inflection may be sensitive to features such as abstract. In section 2.4 we also argued that the ordering of case features relative to number features is such that we can never get plural second locatives or second genitives. So the second locative fits within the more general scheme of things in that it is conditioned by number in accordance with our claims about the ordering of features within a path in
Another reason why the second locative is of interest is that it is to be found with a small group of nouns (less than 150). This leads us to the intriguing question of whether we should accept it as a separate case which for the vast majority of nouns happens to be the same as the ordinary prepositional (standard locative) (Comrie 1986). Our answer to this question is yes.

It has also been argued by Fowler (1987: 85) that the semantics of the second locative are inconsistent and that there is little predictability to its formal realisation. While it is not possible to give either a purely semantic account or purely formal account to determine whether a noun may have the second locative as a formal case, we find that there are morphonological and semantic determinants which determine its formal realisation. We shall make use of the stress and indexing information we discussed in sections 6.5 and 6.7 in relation to the nominal stress system of Russian, as treated by Brown et al. (1996). Comrie's (1991: 42-47) distinction between distributional and formal case is applied to the issue and we shall argue that case may be structured and that the second locative is indeed a distributional subcase analogous to the animate subgender (Corbett 1991: 163; Brown forthcoming). This follows from the hypothesis that syncretism of formal cases comes about because the cases have syntactic and semantic features in common (Comrie 1991: 47 and 54 fn7). We therefore determine in this chapter the role that morphonology, stress and semantics play in determining whether a noun may formally realise the second locative. Before this, we argue that the second locative needs to be treated as a valid case in order to account for modification within noun phrases.

7.1 An overview of the second locative

The second locative is a distributional case in its own right, rather than just an idiosyncratic variant of the prepositional case for a small number of nouns. The prepositional case is assigned by the prepositions na 'on', v 'in', pr'i 'near' and o 'about'. For a small number of nouns, however, the second locative is used with the prepositions na 'on' and v 'in', when for the same nouns the expected prepositional ending is used with the other prepositions, pr'i 'near' and o 'about'. We can illustrate this with an example lexeme ZAVOD 'factory', which does not realise a second locative, and an example lexeme BEREG 'shore', which does. In (7.1 a-b) the noun ZAVOD 'factory' has the same form with -e for both the preposition na 'on' and the preposition o 'about'. In (7.2 a-b) the noun BEREG 'shore' has the form with -t for the preposition na 'on', and the form with -e for the preposition o.
(7.1)

a. Ivan rabotaet na zavod-e
   Ivan works on factory-SG.PREP
   'Ivan works at the factory.'

b. Ivan govor'it o zavod-e
   Ivan talks about factory-SG.PREP
   'Ivan talks about the factory.'

(7.2)

a. Ivan živ'ot na bereg-ú
   Ivan lives on shore-SG.LOC2\(^1\)
   'Ivan lives on the shore.'

b. Ivan govor'it o bereg-e
   Ivan talks about shore-SG.PREP
   'Ivan talks about the shore.'

On the basis that there is at least one noun phrase which marks this case, we may claim that the second locative is a valid distributional case. It should also be noted that there are a small number of nouns of class III for which the same distribution holds. They have a second locative in stressed -i and a prepositional case in unstressed -i.

According to Čurganova (1973: 233), Obnorski (1927) had shown that the spread of the locative ending -u was associated with mobile stress. This meant that at one time the exponents -e or -u were selected on the basis of the stress paradigm of the noun.

In Contemporary Standard Russian it appears that the second locative has to be accounted for in terms of a combination of interdependencies. Whereas for certain nouns the second locative must be used, as in (7.2 a), there are a number of nouns

\(^1\)We have used the gloss LOC2 to distinguish the second locative form from the prepositional. This is not the feature that we use in our treatment of this case in the next chapter. Instead, we argue that the second locative involves a feature specification which is an extension of the feature specification for the standard prepositional case.
which may vacillate in terms of whether the second locative is used with them or not. An example of this is the lexeme CEX 'workshop' where the second locative is optional (Gorbačevič 1973: 487; Zaliznjak 1977: 573). Graudina, Icković and Katlinskaja (1976) is a dictionary of grammatical variants with information on usage based on text corpora and some material from questionnaires (Graudina et al. 1976: 4). It gives information on preferences where there is more than one possibility for expressing a particular meaning. There are, for example, two variants for expressing the meaning 'in the workshop', namely \( v \text{ cexú} \) or \( v \text{ cexe} \). Graudina et al. (1976: 134-137) took from a two million word corpus examples of 100,000 variants of different kinds, of which there are 655 inflectional variants with the prepositions \( v \) 'in' and \( na \) 'on'. Of these 67.63% (443) followed the \( v \text{ cexe} \) 'in the workshop' pattern, whereas 32.37% (212) followed the \( v \text{ cexú} \) 'in the workshop' pattern. Ward (1965: 174) claims that, where there is a choice, the alternative in -e will be used when there is an adjective present. This is a qualitatively different claim from that of Franks (1995: 43 and 58 fn36), who, with the exception of set phrases and place names, appears to rule out the use of the second locative with modified NPs altogether. In section 7.2.1 we show on the basis of examples cited from Russian literature and from work with informants that the second locative does occur in modified NPs.

A number of important points are to be made concerning the second locative. There is a quite clear semantic restriction on its use: it never occurs with animate nouns (see, among others, Graudina et al. 1976: 134). This fits in with other Slavonic languages, where animacy plays a role in determining the realisation of the locative case, for example in Czech (Comrie 1978: 184). It appears also that there is both a phonological and a prosodic interdependency, in that the second locative is generally restricted to monosyllabic nouns which have stress on the stem throughout the singular, and the ending throughout the plural. There is also a morphological restriction in that the second locative may only occur with class I and a small number of class III nouns. We shall argue that the prosodic interdependency must be formulated in terms of the indices that we used to account for the nominal stress patterns. The prosodic interdependency is quite clearly paradigmatic, as it is formulated in terms of a contrast between singular and plural, and the indices allow us to define smaller inflectional classes which are 'parasitic' on the declensions.

The semantic interdependencies are more complex than the negative statement that animates never have the second locative. Indeed, there are possibly a number of other finer grained distinctions to be made, such as that the second locative, including
that for the third declension, is also used with body-parts. In fact, virtually all class I nouns which have pattern C stress and denote body-parts appear to have a second locative -u. Declension III nouns with stress pattern E also have second locative -i. The only exception to this generalisation appears to be the somewhat high-flown word kist 'hand'. According to Wierzbicka (1996: 95) the whole body might be seen in terms of her semantic primitive INSIDE.

'... presumably the whole body can be seen, across cultures, as something INSIDE which there are various interesting and important "things" (or "parts").' Wierzbicka (1996: 95)

It is important to note at this point that a distinction should be made between the inherent meanings of the items which may have a second locative and the actual meaning of the prepositional phrase which arises when the item is combined with either of the prepositions v 'in' or na 'on'. For example, (7.3) cited in Dokonova (1963: 121) contains the noun boj 'battle', which gains its location reading when it is combined with the preposition v 'in'.

\[(7.3)\]
\[
\text{Ne terjajte bodrost' v neravn-om boj-u}
\]
\[
\text{not lose courage in unequal-SG.PREP battle-SG.LOC2}
\]
\[
\text{'Do not lose courage in the unequal battle.' (Mixalkov: Smelo, Druz'ja)}
\]

It is also not enough for us to claim that items which have a second locative do so if they have a particular stress pattern or inherent semantics when they combine with a preposition which has locative meaning. It is not possible to use, for example, the preposition pr'l 'at' with the second locative. In fact, it is limited to the prepositions v

---

2On the last page of an article on locative constructions in Russian Fleischmann (1983: 8) lists the body-part-locative as an example of type 5, where emphasis is placed on an endpoint. He cites the following example, which we render here in phonological transcription:

central'izacija v rukax bur'raz'ii ogromniix kap'italov

'the concentration in the hands of the bourgeoisie of large amounts of capital'

This is the only example cited, and it is problematic from the point of view of location and body-parts, as these are used in an extended abstract sense.

3Examples cited from literature are given in transliteration.
'in' and na 'on'. According to Wierzbicka (1996: 96) spatial prepositions emerge fairly early on in child language, and she cites Johnston and Slobin (1979) and Slobin (1985), whose studies have indicated that prepositions are acquired in a particular order. Slobin (1985: 1180) argues that cross-linguistic acquisition data show that at an early stage notions of containment, support and contiguity are initially most salient. Significantly, the first locative notions appear to be 'in', 'on', 'under' and 'beside'. According to Slobin locative relations can be arranged in an accessibility hierarchy, reproduced in (7.4) below, where concepts to the left are acquired first.

\[(7.4)\]

\[\text{'in'/'on'} < \text{'under'} < \text{'beside'} < \text{'behind + F/B'} < \text{'in front + F/B'} < \text{'between'} < \text{'behind - F/B'} < \text{'in front - F/B'} \text{(Slobin 1985: 1180)}^4\]

What appears to be significant is that the two prepositions with which the second locative may occur are also those which appear to be acquired early on. Discussing the evidence in terms of her semantic primes INSIDE and PLACE Wierzbicka (1996: 96) points out that the most salient aspect of the acquisition probably relates to the universal INSIDE rather than the notion PLACE. Given that the second locative in Russian may also occur with the preposition na 'on', it must be that it is not just restricted to the universal notion of containment INSIDE.

Semantics apart, another point to bear in mind in relation to the second locative is that it has associated with it at least two features which are involved in strategies for language acquisition: the 'operating principles' (OPs) that attention should be paid to the end of a unit and to a syllable which is under stress (see Peters 1985: 1038 and Slobin 1985: 1166). Of course, the fact that the second locative is a stressed inflection does not mean that it is more important than the other inflections. If it were, it would not be so under-represented formally. Argumentation on the basis of acquisition data is highly problematic, and there is one important point to bear in mind in relation to the issue of the second locative. The fact that it occurs under stress may have contributed to its survival, purely because language acquisition heuristics place importance on particular phonological attributes associated with it. The question remains whether those attributes are associated with it for reasons other than history. We shall not consider this aspect of acquisition further. The important

\(^4\)The F/B combination "refers to objects that have an inherent front and back" (Slobin 1985: 1180). Reference objects such as people, cars, houses have an inherent front or back. Objects which do not are ones which lack "inherent orientational features" (Johnston and Slobin 1979: 530), such as trees.
point to note is that the prepositions na and v are associated with basic semantic notions. We shall look to see how this fits with our list of nouns.

Serious consideration must also be given to the question of collocations. According to Graudina et al. (1976: 135) the use of the second locative is decreasing and this reduction involves both a specialisation of the meaning of individual items and the treatment of prepositional phrases containing the second locative as set collocations or phraseologisms. However, although the number of nouns with which the second locative occurs may have reduced, it appears that with those nouns where it is obligatory it can be used to create new modified noun phrases which are not just set collocations or phraseologisms.

7.2 The data

According to Ilola and Mustajoki (1989: 42) there are 128 masculine nouns which have a stressed prepositional ending -ű, 31 feminine nouns, and two neuters, with a prepositional ending in stressed -i. The masculine nouns must all belong to declension I, the neuters to declension IV, and the feminines all belong to declension III (Ilola and Mustajoki 1989: 43). This adds up to 161 nouns in total. In appendix VII we have taken all of the nouns which may have a second locative (our term for this stressed prepositional ending) and placed them in a table together with information about meaning, declension class, stress pattern (according to Zaliznjak’s (1977: 31) classification), optionality of the ending, and whether or not the noun is restricted to either of the prepositions v and na. Appendix VII is the result of searching the electronic version of Zaliznjak (1977) provided by the Department of Slavonic Languages, University of Helsinki. As the calculations in Ilola and Mustajoki (1989) are based on working with and developing this electronic version, one should expect the figures to match. The total number of entries in the table in appendix VII is 146. 15 short of the total of 161. However, the table in appendix VII treats nouns which have the same meaning but alternative stress patterns as one entry, whereas these have separate entries in the electronic dictionary (Ilola and Mustajoki 1989: 4). Only when the lexemes quite clearly had different meanings (i.e. when they were homonyms) have they been kept as separate entries in appendix VII. Happily, we have examples of 15 entries which have not been included in appendix VII, because they represent stress variants. This is reflected in the information in the

5Fowler (1987) also contains a list of second locatives, as well as second genitives, based on the electronic version of Zaliznjak (1977).
'Stress Pattern' column, where more than one stress pattern is given. The nouns in question are given in (7.5) below.

(7.5)

cex 'workshop', čan 'vat/tub/tank', god 'year', grud 'breast', jar 'steep slope'. jar 'ravine', mis 'promontory', most 'bridge', os- 'axis', polutén 'penumbra', port 'port', prud 'pond', step 'steppe', šl-ax 'highway' veter 'wind'

Where there does not appear to be a neat tie-up is in the figures for the masculine and feminine nouns. In appendix VII there are 118 masculine nouns, which is ten short of the 128 given by Ilola and Mustajoki. We can see that there are 11 declension I nouns in (7.5). Furthermore, the number of feminine, that is declension III, nouns in appendix I is 26, which is five short of the 31 given by Ilola and Mustajoki. Only four of the nouns in (7.5) belong to declension III. We see therefore that the figures tally, if we assume that the number of declension I nouns is one more than Ilola and Mustajoki state, and the number of declension III nouns is one less. These finer details aside, table 7.1 summarises the information in appendix VII. The number of nouns taking the second locative is given, together with a figure for those nouns for which it is optional.

<table>
<thead>
<tr>
<th>Declension</th>
<th>Obligatory</th>
<th>Optional</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>88</td>
<td>30</td>
<td>118</td>
</tr>
<tr>
<td>III</td>
<td>20</td>
<td>6</td>
<td>26</td>
</tr>
<tr>
<td>IV</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>(I, III and IV)</td>
<td>110</td>
<td>36</td>
<td>146</td>
</tr>
</tbody>
</table>

**Table 7.1:** Nouns with a second locative based on information in Zaliznjak (1977)

If we take the total number of nouns calculated in Brown et al. (1996: 57), namely 43996, and express the total number of nouns with a second locative as a percentage of this total, we find that the overall percentage of nouns with a second locative is 0.33%. The figure from Brown et al. (1996: 57) is taken as the total for nouns, as this ignores indeclinable nouns and adjectival nouns, as well as others included in the total count in Ilola and Mustajoki (1989: 9). According to our calculations there are 55 nouns with a second locative from the first 1500 in
Zasorina's (1977) frequency dictionary.\textsuperscript{6} If these 55 are expressed as a percentage of the first 1500 we find that they account for about four percent of this group.

The figure increases further if we express the number of nouns with second locative for declension I as a percentage of the declension I nouns in the first 1500 from Zasorina (1977). Of the 55 nouns taking second locative which occur among the most frequent, 44 belong to declension I and 11 belong to declension III. Of the 1500 most frequent nouns 668 belong to declension I, and 112 belong to declension III.\textsuperscript{7} Table 2 gives the figures for nouns taking the second locative which occur in the 1500 most frequent.

\textsuperscript{6}During the ESRC project R000233633 'A DATR Theory of Russian Morphology' a lexicon of the first 1500 most frequent nouns from Zasorina (1977) was compiled. Nouns were entered together with additional information about their rank as nouns and as lexemes in general. Information about the second locative, together with other less general facts about a particular lexical item, was also given in the form of comments in the original file, but this is not to be found in the version made publicly available. The figure of 55 nouns was obtained by checking off the nouns in the lexicon against those in the table in appendix I. It should be borne in mind that the lexicon does not contain lexical entries for KRAJ 'country', KRUG 'circle (of people)', POL 'floor', ROD 'kind', TOK 'birds' mating place', TOK 'threshing floor', VAL 'shaft', VAL 'rampart/roller (wave)', or VERX 'hood (of carriage)' with exactly the meanings stated, although it does contain lexical entries for lexemes with the same stem and forms. As Zasorina (1977) does not appear to indicate which meaning is intended when an item on the frequency list may be homonymous, it is reasonable to include these lexemes, as the frequency count may also refer to them.

\textsuperscript{7}The figure for declension I was obtained in the following way: (i) the UNIX tool egrep was used to search for lines in the lexicon which contain the equation indicating membership of declension I; (ii) egrep was then used to find the number of equations which indicate that the noun is a singularia tantum which declines as declension I; (iii) egrep was used to count all equations which indicated that the sex of the referent of the lexical entry was male, because declension class is then assigned by default, and would not be found by the search in (i); (iv) a manual search is made for all items that have a male referent but which belong to declension II, and for any singularia tantum nouns declining like class I which have a male referent and are therefore counted twice under (ii) and (iii). and these are then excluded. The figures for (i), (ii), (iii) are added and the figure for (iv) is then subtracted from the total: 518 + 8 + 150 - 8 = 668. Of the eight nouns in (iv) one is a singularia tantum noun GOSPOD' 'lord'. The other seven are masculine nouns in declension II: D'AD'A 'uncle', DEDUŠKA
The second locative accounts for a very small proportion of the totality of Russian nouns, and although it accounts for a not insignificant number of the most frequent declension I and III nouns, we see that there are still quite a few nouns which are not to be found among the most frequent which still have the second locative. Listing these nouns and the prepositions with which they occur as collocations would not be acceptable, because we have to account for the generalisation that the second locative always ends in -u for declension I and -i for declension III. Furthermore, the ending is always stressed. Even if it is claimed that the second locative is not a case, a way must be found to fit it into the classification of the Russian noun system which takes account of these generalisations. Listing would not explain why it is limited to the prepositions v and na, or why the construction found is a prepositional phrase consisting of a preposition and noun, rather than just an adverb like domoj 'homeward', which itself combines the meanings of a preposition and a noun *k domu 'to home'. These arguments so far do not necessarily lead us to the conclusion that the second locative must be a case in its own right. As we shall show, the generalisations and interdependencies which determine for us whether a noun may have a second locative are essentially a concern for morphology. We could treat their distribution in terms of collocations and phraseologisms, which could be treated in a fashion similar to certain idioms as partially morphological. However, there is evidence to indicate that we should consider the second locative a case in its own right.

### 7.2.1 The Second Locative in Modified NPs

It has been claimed that the second locative does not occur in modified noun phrases except as a set collocation or where a place name is involved (Franks 1995: 43 and 58 fn36). However, this appears to be contradicted by example (7.3) and there

<table>
<thead>
<tr>
<th>Declension</th>
<th>A. Out of 1500 most frequent</th>
<th>B. Number out of A taking second locative</th>
<th>B/A as a percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>668</td>
<td>44</td>
<td>7i%</td>
</tr>
<tr>
<td>III</td>
<td>112</td>
<td>11</td>
<td>9i%</td>
</tr>
</tbody>
</table>

Table 7.2: Second locative accounts for a greater proportion of the most frequent nouns

'grandfather', JUNOŠA 'young person', MALČIŠKA 'small boy', MUŽČ IINA 'husband', PAPA, 'dad' STARŠINA 'sergeant-major'.

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are other ones to be cited which clearly show that this is not just a question of set collocations. Example (7.6), given in transliteration, is cited by Dokonova (1963: 121).

(7.6)
Prebyvanie Xammaršel’da na kak-om by tenure.SG.NOM Xammaršel’ d.SG.GEN on which-SG.PREP PART
to ni bylo post-u absoljutno nemyslimo
that never was post-SG.LOC2 absolutely unthinkable
‘Hammarskjöld’s tenure of whatever post is absolutely unthinkable.’
(Pravda 15.3.61)

In (7.6) we see that the modifier kakoj ‘which’ is itself separated from the noun by further material. Other examples can easily be found, including one from Doktor Živago. In example (7.7), in transliteration, we find two adjectives occurring in a modified noun phrase before a noun with the second locative ending.

(7.7)
... širokoj reki i wide.SG.GEN.FEM river.SG.GEN and
krasivogo doma s cerkov’ju beautiful.SG.GEN.MASC house.SG.GEN with church.SG.INST
na vysok-om protivopoložn-om bereg-u on high-SG.PREP opposite-SG.PREP bank-SG.LOC2
ne bylo by na svete, ne not was PART on earth.SG.PREP not
slučis’ neščastija.
occur.IMPER accident.SG.GEN
‘... the wide river and beautiful house with the church on the steep opposite bank would not have existed, were it not for the accident.’
(Boris Pasternak, Doktor Živago)

Examples (7.3), (7.6) and (7.7) indicate that it is incorrect to claim that the second locative does not occur in modified noun phrases, except when the modification involves a place name or there is a set collocation. None of the examples given involve place names for modification. It can also be argued that examples (7.6) and (7.7) certainly do not involve set collocations.

We can further test that the second locative occurs in modified noun phrases that are not set collocations and build into our test a measure of confidence regarding
the informant information. Zaliznjak (1977) lists the lexeme AD 'hell' as having an obligatory second locative and only a 'potential' plural (Zaliznjak 1977: 21. 68 and 235), which means that AD is essentially a singularia tantum noun. If we set up a context in which speakers are forced to use a plural form of the lexeme AD and also use its second locative with a modified adjective, we can compare the degree to which speakers are prepared to use a second locative in a modified noun phrase which is not a set collocation with the degree to which they are prepared to use a plural form of the noun AD. If it turns out that some speakers are prepared to use the second locative in modified noun phrases but still avoid or reject the formation of plural forms of the noun AD, then we can conclude that they are not suspending their grammaticality judgements (because they still reject the plural forms), but do indeed find the second locative in modified noun phrases acceptable.

Appendix VIII contains the translation passage which was designed to test further our claim that the second locative occurs in modified noun phrases. Ten native speakers of Russian who also had command of English were asked to translate an English text with the orientation of a pseudo-anthropological study. This was used to provide a plausible context for eliciting the plural forms of the lexeme AD and modified noun phrases containing a second locative. There were two contexts in which a modified noun phrase containing the second locative would be expected as a translation. In two other translation contexts it would have been possible to use the plural genitive and plural nominative of the lexeme AD. For both the modified noun phrase and the plural forms it would be possible to avoid using the second locative or plural forms of AD by using a circumlocution with words for 'type'. Table 7.3 gives the number of translations (out of ten) where circumlocutions were used, for both of the modified noun phrases, the plural genitive, and plural nominative.

<table>
<thead>
<tr>
<th></th>
<th>Second Locative in modified NP</th>
<th>Plural Genitive form of AD 'hell'</th>
<th>Plural Nominative form of AD 'hell'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circumlocutions</td>
<td>0</td>
<td>6.58</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 7.3: Second Locative with modified noun phrases is totally acceptable

Half marks have been awarded where the translator offered a circumlocution or the direct realisation as another possibility. For the plural genitive one translator offered the alternative. For the plural nominative two translators offered the alternative.
Table 7.3 shows that no circumlocution is ever used instead of a modified NP containing the noun AD with second locative ending. On the other hand, in at least 60% of the translations the plural genitive and plural nominative of the lexeme AD are avoided. So the second locative is totally acceptable in modified noun phrases, whereas speakers vary with regard to acceptability of the plural forms of AD. This indicates that for all speakers the occurrence of the second locative in modified noun phrases is not perceived as problematic in the way that the plural forms of AD are. Furthermore, the invented context shows that there is no way in which we could claim that the modification involved a set phrase or collocation. Accordingly, all ten translators produced the modified noun phrases in (7.8 a-b), with one adding the demonstrative etot 'this' for good measure.

(7.8)

a. V [et-om] zelen-om ad-ú
   in [this-SG.PREP] green-SG.PREP hell-SG.LOC2
   'In [this] green hell.'

b. v krasn-om ad-ú
   in red-SG.PREP hell-SG.LOC2
   '... in the red hell.'

Even if there were even fewer nouns with a second locative than there are, the combinatorial potential of the second locative forms with adjectives and modifiers forces us to accept that it is indeed a separate case in its own right. Generally, it is a distributional case which is only distinguished in a small group of nouns. But this is enough. This is the most important argument regarding the status of the second locative.

7.2.2 Current Tendencies

In Krysin (1974: 177) it is stated that there is tendency for speaker's age to influence the use of the second locative form -ú, with younger generations using it less. It should be stated, however, that the youngest age group shows an increase in usage over the one immediately preceding it, although this does not reach the levels of the oldest group. Krysin (1974) also contains information on contexts, where informant questionnaires indicate that the more the contextual meaning moves away from the purely locative, the less likely is the use of the second locative ending with the prepositions v 'in' or na 'on'. In Krysin (1974: 176-177) a questionnaire tested the choice of the second locative ending according to three contexts, (7.9 a-b).
(7.9)
a. Vorony išč...9 zimoj korm v sneg...
crow.PL.NOM search... in. winter food in snow...
'In winter crows search for food in the snow.'

b. Xudožniki čego-to iščut v
artist.PL.NOM something.GEN search.3RD.PL in
sneg..., no živopisnosti v sneg... net. -
snow... but picturesque.quality.SG.GEN in snow... not
utverždal Brjullov.
asserted Brjullov
'Artists search for something in (the) snow, but there is nothing
picturesque in (the) snow, asserted Brjullov'

The informants had to fill in the gaps indicated by ellipses. In (7.9 a) about 95%
chose the second locative ending. In the first gap in (7.9 b) 74% chose the second
locative ending. In the final gap in (7.9 c), where the meaning is more abstract, 37%
chose the second locative ending, with the majority choice being the -e prepositional
ending. Jakobson (1936; 1971) also makes the point that the second locative is used
when the noun is strictly a location.

We presented 16 informants with a questionnaire which contained sentences
involving forms of eight example lexemes, some with a facultative second locative:
BAL 'dancing) ball', BAS 'bass (register)', CEX 'workshop' (facultative), BEREŽOK
'(small) shore/bank', BEREG 'shore/bank', GLAZ 'eye', ČAJ 'tea' (facultative), DOLG
'debt' (collocation). The last of these items is listed as a collocation v dolgu 'in debt'
in Zaliznjak (1977: 232). In appendix IX we give the sentences and a mean score for
each, where four is the highest score (totally acceptable) and one the lowest
(unacceptable). With the nouns BEREŽOK and ČAJ the informants preferred the
form in -e in both the modified and unmodified contexts. With ČAJ there was a
marginal difference in acceptability in the unmodified context (where the mean score
was two). Our informants therefore do not accept these two lexemes as having a
second locative form. Indeed, Nesset (1994 b: 74-75) reports that, of the 121 nouns

9The questionnaire also contained a cover task which required conjugation of the verb iskat 'to search
for'.
with second locative he found in secondary sources, only 60 (20 declension III, and 40 declension I) were given separate forms by more than 13 of his 18 informants.

Examples with GLAZ were all considered to be virtually unacceptable (all scored two). With the lexeme BAL 'dancing) ball' the forms in -e after the preposition na 'on' are virtually unacceptable (mean score of two). While -ã is the grammatical choice, modification appears to increase the acceptability of this form further (from a mean score of three to a mean score of four). The noun BAS 'bass (register)' appears to have equal acceptability with the second locative form and -e (mean score of three). However, acceptability judgements decrease to virtual unacceptability (mean score of two) for both variants when modification is involved. This may well be because the modifier chosen was xriplij 'hoarse' which is a pragmatically odd modification of 'bass register'. Zaliznjak (1977: 542) lists BAS as having a second locative only for this meaning. This gives us some indication of how a process could start in which the second locative can only be used as a set collocation. We can contrast set collocations with the lexeme BAL, which does allow creative modification. For the noun CEX, which has a facultative realisation of the second locative, informants preferred the ending -e, and appeared to reject the ending -ã. Somewhat surprisingly, the acceptability for both variants increased with modification. With the noun BEREG, of which we have already seen an example of double modification with a second locative in (7.7), -ã is clearly the grammatical choice and modification does not change acceptability judgements. With the noun DOLG we find that v dolgû 'in debt' is totally acceptable, in contrast with *v dolge. Both variants score equally well with modification, but even here it is not totally the case that v dolgû is a set collocation not allowing for modification. The noun phrase v kartôcñom dolgû 'in debt at cards' has a mean score of three, the same as the variant in -e with the same modifier. In sum, it appears that the number of nouns which take the second locative may be less than listed in Zaliznjak (1977), but there are some, such as bereg 'shore' and bal 'dancing) ball', which require the second locative, and for which, as we have demonstrated, modification by one or more adjectives is perfectly acceptable.

Although we see that there are nouns for which the second locative may not be acceptable as stated in Zaliznjak, the sets of sentences in (1) and (4) of Appendix IX with the lexemes BAL 'ball' and BEREG 'shore' also demonstrate that adding modifiers still requires us to use the second locative. With the lexeme BAL it appears that adding the modifier in question increases the acceptability of the second locative form. With the lexeme BEREG it appears that modification makes no difference. The second locative is still the only acceptable choice. Given the possibility that
these nouns combine with adjectives with total acceptability of the second locative, a strict collocation-based approach appears to be untenable. In addition, we must also account for the choice of form of the agreeing adjective and demonstrative (i.e. the standard prepositional case). As we show in chapter eight, this proves to be no problem for our analysis which imposes a structure on the feature combination which accounts for the second locative.

There does appear to be a difference between the second locative in terms of its behaviour with modification and the second genitive. With the example sentences in our questionnaire it seems that only with the noun ČAJ 'tea' does modification have a negative effect on acceptability. Even here, however, the noun in its unmodified form is barely acceptable. Our informant judgements appear to indicate that modification makes little difference for nouns for which the second locative is obligatory. This means that the second locative has a different status from other candidates for casehood, such as genitives of nouns which occur with numerals, which is discussed in Corbett (1993), and the partitive genitive, where modification of the noun by an adjective appears to create a preference for the standard genitive ending. In Panov (1968: 190) Graudina, who wrote the relevant section, discusses this. In a survey people from four different age groups were asked, among other things, to give the appropriate ending for the forms of the lexeme ČAJ 'tea' in three different contexts. Two of these contexts were essentially contrasted by the presence or absence of a modifying adjective before a noun which one would expect to be in the genitive. The relevant sentences are given in transliteration (7.10 a-b).

(7.10)

a. My vypili dve čaški ča...
we drank two cups tea...
'We drank two cups of tea.'

b. Ja vypil stakan krepk-ogo ča...
I drank glass strong-SG.GEN tea...
'I drank a glass of strong tea.'

A total of 4015 people were questioned. Respondents were divided according to age group. There were five age groups, indicated in the table (Panov 1968: 189-190) by the period in which they were born (1870-1909, 1910-1919, 1920-1929, 1930-1939.

-183-
1940-1949). For each age group there was less of a preference for the -u ending in (7.10 b) than in (7.10 a). The difference is significant (Panov 1968: 192).

These data are also informative as they show us that the combinatory possibilities of formal cases, which we accept as adequate descriptions for the second locative and genitive, are independent of the number of nouns which have those formal cases, as we know that the number of nouns taking the second genitive - of which there are 396 examples according to Ilola and Mustajoki (1989: 41) - is probably about twice that of those taking the second locative.

10The Russian term used in Panov (1968: 192) is znaïmost'. Panov (1968: 190) gives the figures for (7.10 a) and (7.10 b) as percentages of the total for each age group giving a reply who chose the -u ending. We reproduce the figures starting with the oldest group. The percentage on the left is for the sentence (7.10 a), the percentage on the right for (7.10 b) and the figures in brackets are the total in each age group giving a reply for each question: 45.5% and 40.6% (356 and 352); 44.6% and 40.5% (186 and 185); 46% and 42.7% (445 and 440); 41.3% and 36.7% (1295 and 1294); 36.9% and 30.7% (1655 and 1664). The reader should note that the percentages are themselves a proportion of the figures in brackets (i.e. they are not the figures in brackets expressed as a percentage). It is obvious that the smaller sample of people in the older age groups means that claims of significance are less reliable. In fact, standard error analysis of the 1870-1909 group would indicate that there is no significant difference. A more subtle test of significance may well indicate that there is. However, standard error analysis of the 1940-1949 group indicates that the difference is significant:

\[
\text{standard error} = \sqrt{\frac{p(1-p)}{n}}
\]

where \( p = 0.369 \)

\( n = 1655 \)

or

where \( p = 0.307 \)

\( n = 1664 \)

For both (7.10 a) and (7.10 b) in this group, the youngest generation in the survey, the standard error is 0.01 or \( \pm 1\% \), where the figures for (7.10 a) and (7.10 b) are 36.9% and 30.7% respectively. This indicates that the difference is significant in the contemporary language.
In this section we argued that the second locative represents a distributional case in its own right. Furthermore, we have seen, with examples from Russian texts and informant work, that nouns occur with a second locative in modified noun phrases. This fact would create severe problems for an approach which attempted to treat the second locative purely in terms of collocation and lexical stipulation.

In the next section we consider the interdependencies, both morphonological and semantic, which determine the appearance of a separate formal realisation of the second locative.

### 7.3 Interdependencies

The first generalisation to be made regarding the second locative is the obvious one regarding the declension classes with which it may occur. Note here that it would be somewhat problematic to formulate this generalisation if we considered declensions and grammatical gender to be isomorphic.

(7.11)

The second locative may only be realised formally in declensions I and III (and by two nouns in declension IV, where one noun is derived from the other).

A significant generalisation to be made about nouns which have a second locative is that the majority have monosyllabic stems (see also Švedova et al. 1980: 488). If we exclude those nouns which have metathesis (polnoglasie), such as bëreg 'shore', or a fleeting vowel, such as bačok 'side (dim.)', or both, such as bere źök 'shore (dim.)', this leaves 10 nouns which consist of more than one syllable, including the two class IV nouns which Zaliznjak lists as having a second locative. Examples of such polysyllabic nouns are artpółk 'artillery regiment', polubréd 'partial delirium' and ugolök 'corner (dim.)'. These three exemplify the three different types of violation of the monosyllable generalisation. The first is a so-called 'stump' form

11 An historical explanation for this might be that the u-stem declension, the diachronic source of second locative ending, contained only monosyllables (Thorndahl 1974: 887). The claim that the promotion of the -u ending at one point is connected with velars in order to avoid consonantal alternations as the result of historical palatalisations Šaxmatov 1957; Bulaxovskij 1958) is considered problematic by Thorndahl (1974: 892-894). Given the large number of declension I nouns in appendix VIII which do not end in a velar, we do not see this as a particularly important condition in the modern language.
based on a head noun which takes the second locative, namely polk 'regiment'. The second is a formation with the complex suffix pol(u)- 'half' from a noun which takes a second locative. The last example is of a diminutive formed from a noun which has a second locative. What is interesting here is that the fleeting vowel of the stem ugol of the base lexeme UGOL 'corner' ceases to be a fleeting vowel when the diminutive suffix -(o)k is added, itself containing a fleeting vowel. These considerations apart, we see that in every instance those nouns which are not monosyllabic are formed from ones that take the second locative. This leads us to the morphonological interdependency stated in (7.12) and the generalisation in (7.13) regarding word-formation.

(7.12)
A noun may have a second locative, if it has a monosyllabic stem (where stems with metathesis or fleeting vowels are counted as monosyllabic).

(7.13)
A noun may have a second locative, if it is the result of category preserving derivation (i.e. word-formation that forms nouns from nouns), and the noun on which it is based has an obligatory second locative.

In section 7.1 we pointed out that the connection between mobile stress and the use of the second locative had been noted at least as far back as Obnorskij (1927). As we have shown in sections 6.5 and 6.7 of the previous chapter, the stress patterns of Russian nouns are determined by indices for a particular declension. The stress pattern which appears to be most clearly associated with the second locative is pattern C, which is the third choice for declension I nouns. As it is not just pattern C, but pattern C and declension I which is associated with the second locative, we see that we should really talk of it in terms of an association between the index for this pattern and the second locative.

The number of declension I nouns in appendix VII which do not have stress pattern C is 42 (out of 118). This figure includes nouns which Zaliznjak has down as having hypothetical stress pattern A, such as the lexeme AD 'hell'. Where the second locative is optional and there is a choice of stress pattern between A and C we have assumed that the optionality has to do with the choice of stress pattern. Where other choices of stress pattern exist and C is not the first choice, we have also included nouns of this type. It can be seen therefore that our evaluation of the prevalence of pattern C for declension I errs on the conservative side. The stress pattern associated with declension III nouns that have the second locative is pattern E (stress on stem in
the singular and ending in the plural, except the nominative and inanimate accusative plural). There are 6 nouns out of the 26 declension III nouns in our list which are not pattern E. For the two declension IV examples, one of which is a derivative of the other, we do not make any claims, as this would essentially come down to a generalisation about one noun. In table 7.4 declension I nouns with a second locative which have pattern C stress and declension III nouns with a second locative which have pattern E stress are expressed as a percentage of the total number of nouns in their declension which have a second locative.

<table>
<thead>
<tr>
<th>Declension I</th>
<th>Pattern C</th>
<th>Pattern E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>64%</td>
<td>1%12</td>
</tr>
<tr>
<td>Declension II</td>
<td>0%</td>
<td>77%</td>
</tr>
</tbody>
</table>

Table 7.4: The relationship between the second locative and stress pattern

Table 7.4 leads us to the generalisation in (7.14).

(7.14)  

a. For declension I the second locative is generally associated with pattern C stress (index 3).

b. For declension III the second locative is generally associated with pattern E stress (index 2).

In addition to generalisations (7.11)-(7.14) there is at least one more morphonological interdependency which is true of declension I nouns, which is borne out by close inspection of appendix VII. This generalisation is summarised in (7.15).

(7.15)  

No declension I noun which has a second locative ends in a soft consonant other than /j/.13

12 The lexemes GOD 'year', PORT 'port' and VETER 'wind' score 0.5, as they have pattern E as less preferred choices.

13 This appears to be what Ilola and Mustajoki (1989: 42) state, namely that, "Masculines which have a prepositional case ending -y (-iô) may end in any consonant except an obstruent palatal." There does appear to be one counterexample to (7.15), if we accept the collocation vo xmel'ü 'tight/drunk' (Zaliznjak 1977: 588).
As Reformatskij (1975: 85) has pointed out, within any paradigm, the phoneme /j/ behaves like a hard consonant. As we find that there are consonants which are phonetically hard, but which behave like soft consonants, such as /k/ and /s/, it would be equally reasonable to expect a soft consonant to behave as a hard one. The thing that these functionally soft consonants and the functionally hard consonant /j/ have in common is that they are not paired and therefore no phonemic distinction may arise on the basis of a hard-soft contrast. They are functionally soft or hard, purely because of their behaviour within the paradigm. For this reason we may revise (7.15) to yield (7.16).

(7.16)
Declension I nouns which have a second locative all end in a functionally hard consonant.

It should be borne in mind that conditions (7.11)-(7.16) are satisfied by a number of other nouns which do not have a second locative. This means that we may need to state in a noun's lexical entry that it does not have a second locative. Equally, we will also be forced to state in the lexical entries of certain nouns that they have a second locative. Having dealt with the morphonological interdependencies, we move on to consider the semantic generalisations related to the use of the second locative forms.

7.3.1 Semantic Interdependencies
It is possible to show that there are certain semantic interdependencies related to the second locative, counter to Fowler's (1987: 85) claim that the semantics of the second locative are inconsistent. As we have pointed out, the second locative realisation is determined both semantically and morphonologically.

Obnorskij (1927: 230) notes the relation between the second locative and the developing distinction of animates and inanimates. In fact, there are no animate nouns which have the second locative ending. This leads us to generalisation (7.17).

(7.17)
Every noun which has a second locative is inanimate.

Once we move past this generalisation things start to get more complex. As we have mentioned, it is important to bear in mind the difference between the semantics of the prepositions which may combine with these nouns, namely v and na, and the meaning of the nouns themselves.
Nirenburg (1981: 262) considers the temporal prepositions \( v \) and \( na \) both to be 'closed'. This means that any event described in a sentence where these prepositions occur as temporal adjuncts must occur within the temporal boundaries described by the prepositional phrase. The boundaries may be either close together, or further apart. For 'open' prepositions the event takes place before or after the temporal boundaries described by the prepositional phrase (Nirenburg 1981: 256).

If we consider the temporal examples that Nirenburg (1981: 262) gives, there is also an additional point to be made. Namely, the prepositional case appears to be used when the distance between the temporal boundaries is greater than for the situation described using the accusative. The difference between (7.18), (7.19) and (7.20) is that the first two have a short interval between the temporal boundaries in which the event occurs, irrespective of whether it is habitual as in (7.19), whereas (7.20) has a longer interval.

(7.18)

\[
\begin{array}{ll}
vstat' & v \, šest' \, utra \\
get.\, up.\, PERF.\, INF & in \, six.\, ACC \, morning.\, SG.\, GEN \\
'to \, get \, up \, (perf.) \, at \, six \, in \, the \, morning'
\end{array}
\]

(7.19)

\[
\begin{array}{ll}
vstavat' & v \, šest' \, utra \\
get.\, up.\, IMPF.\, INF & in \, six.\, ACC \, morning.\, SG.\, GEN \\
to \, get \, up \, (impf) \, at \, six \, in \, the \, morning'
\end{array}
\]

(7.20)

\[
\begin{array}{ll}
rabotat' & na \, ferme \, v \, ijule \\
to.\, work.\, IMPF.\, INF & on \, farm.\, SG.\, PREP \, in \, july.\, SG.\, PREP \\
'to \, work \, on \, a \, farm \, in \, June'
\end{array}
\]

Although these examples are taken from Nirenburg (1981: 262), he does not make a direct claim about the relationship between the case and the interval, putting such differences down to differences in the verb.

Using the difference between 'open' and 'closed' and extending it back to the spatial meaning of the prepositions \( v \) and \( na \), we can make a number of generalisations about the nouns which have a second locative. The function of the second locative is formally to distinguish a locative case from the prepositional case which is used with prepositions if no other, such as dative or genitive, is specified by.
a preposition. We should therefore expect to find a formal distinction of the second locative case where the locative function is clearest. We must first be clear about what we mean by location.

(7.21)
A location is a space or temporal interval which is marked by a beginning and an end point. As sides and boundaries are more important for containment, the preposition v has explicit boundaries, whereas the preposition na has implicit boundaries which are of less importance.

This approach to location enables us to account for apparent abstractions or states such as v bredu 'in a delirium', where delirium is a temporally bounded event. More problematic for this approach are nouns such as bas 'bass (register)', klej 'glue', kr'uk 'bent nail', kr'uk 'bent rod', lad 'tone'. Nouns such as l'ot 'flight' have a similar temporal reading to bred 'delirium' when they appear in prepositional phrases. Social organisations which are clearly delimited also come within the definition, which accounts for military organisations, such as polk 'regiment', and other nouns which pick out a delimited group, such as krug 'circle (of friends)'. Nouns for meteorological phenomena, such as veter, are problematic as these are not bounded, and val 'shaft' or 'rampart', val 'roller (wave)' also cannot be fitted to this definition. Certain other categories also are associated with the second locative: body-parts, liquids. Finally, the second locative is also associated with the boundaries themselves, namely bereg 'shore', bok 'side', to name a few. Again, we see that these overlap with other categories we have mentioned. We may sum up the additional categories associated with the second locative in (7.22).

(7.22)
Nouns which take the second locative and follow the generalisations (7.11)-(7.17) may denote the following categories: body-parts, clothing materials, foods, liquids, social organisations. Some of these categories can be explained in terms of generalisation (7.21), whereas others, such as the category of food, cannot but are associated with others that can (foods and liquids overlap, and liquids are found in bounded containers).

There are a number of other additional restrictions. First, the second locative is not used with mathematical entities. So UGOL 'angle' and KRUG 'circle' do not have a second locative, even though UGOL 'corner' and KRUG 'circle (of friends)' do. We argued in section 1.3 that this showed that inflection could be sensitive to a distinction between abstract and concrete. Of course mozg 'mind' is an abstraction.
but one that we all have experience of. This is not true of mathematical abstractions, which are a product of reason rather than experience.

The final part of our section on semantic interdependencies shows how we can establish that certain semantic factors favour the second locative. Recall that table 7.4 showed that for both declension I and declension III there is a particular stress pattern favoured by the majority of nouns which have a second locative. We can use this knowledge to extract information about the semantic categories which go with the second locative. If a noun which obeys all of the generalisations, including the one about stress (7.14), does not have a second locative, then it most likely belongs to a semantic category which disfavours the second locative. If a noun does not obey the stress generalisation (7.14) but still has a second locative, then the semantic category to which it belongs most likely favours the second locative.

We restrict ourselves to the nouns which are among the 1500 most frequent and marked in bold in appendix VII. Using the semantic dictionary of Karaulov, Molčanov, Afanas’ev and Mixalev (1982), each of the frequent lexemes from appendix VII is given as a heading with any of the items listed below it in the dictionary which either obey all of the generalisations (7.11)-(7.17), irrespective of whether they have a second locative, or have second a second locative and violate generalisation (7.14). The information compiled from Karaulov et al. (1982) is given in the form of a list where the frequent nouns which have a second locative are headings. This list is given in appendix X.

Other than animates, semantic categories which disfavour the second locative are much more complex to isolate. The category of 'measure' where a noun may denote a scalar concept disfavours the second locative. This is indicated by the fact that the lexeme ROST 'height/growth' satisfies all the morphonological criteria, as well as the animacy constraint, but does not have a second locative. It appears listed under the headings for three lexemes associated with the body, namely KROV 'blood', MOZG 'brain/mind' and NOS 'nose'. The lexeme SLOJ 'layer' can also be

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14 As we know for sure that animates do not have second locatives, these are already ruled out. Using Karaulov et al (1982) is a good method for cross-referencing the different lexemes. We do not claim that it is an ideal tool. Use of the two volumes of the associative dictionary of Karaulov, Sorokin, Tarasov, Ufimceva and Čerkasova (1994), developed using psycholinguistic experiments, would also fill some of the gaps in headings not covered by Karaulov et al. (1982), but does not enable us to add anything to the already fine-grained generalisations.
excluded, because it is a scalar concept. Note also that we treat 'tone' and 'colour' as scalar concepts, but not 'light'. This explains why TON obeys (7.11)-(7.17), but does not have a second locative, and why SVET 'light' does.

Our analysis also forces us to modify our claim about body-parts, although this generally seems to be borne out. The nouns ROG '(animal) horn' and KOST' 'bone' obey (7.11)-(7.17) but do not have a second locative. First, the association between the second locative and the category of body-parts does not hold when these parts are unambiguously associated with animals only. Second, bones appear to be excluded from association with the second locative. We may contrast, for example, the not so frequent noun ČEREPE 'skull/cranium', which also obeys (7.11)-(7.17)\(^{15}\) and does not have a second locative, with MOZG 'brain/mind' which does. Note that our list in appendix X includes the noun TAZ 'pelvis' (also 'basin') which obeys (7.11)-(7.17) and may optionally have a second locative. We can contrast it with a lexeme for an adjacent part of the body PAX 'groin' which obeys (7.11)-(7.17) and has an obligatory second locative. So bones also disfavour the second locative. There is no clear explanation for why FRONT 'war front', given under the heading for BOJ 'battle', does not have a second locative. We cannot rule out nouns which denote things where a boundary may be fuzzy or alterable through time. TIL 'rear (guard)' which has a second locative may also alter rapidly over time. In this regard we should also mention that M'IR 'world', which occurs under the heading for DOM 'house/home' does not have any boundaries as such. Nor does it have any boundaries when we consider it in terms of human organisations. It occurs in the collocation v m'iru when referring to the world outside the monastery (Zaliznjak 1977: 534). In other words, it is understood in terms of a boundary between the monastery and the society of people outside. Therefore we can see that, in the absence of any other categories which favour the second locative, if there is a lack of any concept of boundary the second locative is disfavoured. We may sum up the categories which disfavour the second locative in (7.23).

(7.23)

Other than animacy, categories which disfavour the second locative are: scalar categories, bones, animal body parts other than fur, concepts without any boundary (implicit or otherwise).

\(^{15}\)ČEREPE is not listed in Karaulov et al (1982).
Before bringing this section to a close, we shall consider those categories which appear strongly to favour the second locative. Again, the measure of this favour is that nouns which obey all of (7.11)-(7.17) except (7.14) (stress pattern) still have the second locative. Under the headings ČAJ 'tea', KROV 'blood' and SAD 'garden' we find the lexeme SOK 'juice' which has pattern A stress and still has a second locative. There appears to be a strong association between liquids and the second locative. To an extent this association merges with an association with 'water' which also covers the lexemes SNEG and L'OD, the latter also not obeying (7.14). The lack of any nouns under the heading VETER 'wind' or which have a second locative there indicates that the association between the second locative and the weather is accidental and only appears because of the association with 'water'.

As has been mentioned on a number of occasions, but subject to the hedges we have just introduced, there is an association between (human) body-parts and the second locative. This is indicated by the fact that LOB 'forehead' under the heading KROV 'blood', another body-part, has the second locative despite violating (7.14). The same is also true of PUX 'fluff/down', which we shall treat as not violating (7.14), but which would violate (7.14) if we followed Zaliznjak's classification of it as a noun with an A-stress pattern. Other nouns which also bear this generalisation out are ROT 'mouth', which violates (7.14), as well as MOZG 'brain/mind' and KROV 'blood', among others.

Finally, if we look at the headings LUG 'meadow' and SAD 'garden' we see that there are a significant number of nouns under these headings which have a second locative. In fact, M'IR 'world' which we have discussed, is the only lexeme under these headings which obeys (7.11)-(7.17) and which does not have a second locative. Similarly, the presence of MOX 'moss' and L'ON 'flax', as well as PUX 'down', all of which violate (7.14), suggests that there is a strong semantic association here. Both LUG 'meadow' and SAD 'garden' are bounded concepts. Equally, there is an association with land and plants, as well as the association with 'water' under LUG. However, L'ON 'flax', as well as the lexemes MEX 'fur' ŠOLK 'silk', should be understood in terms of their function as clothing materials.¹⁶ We sum up additional categories which favour the second locative in (7.24).

¹⁶Note that the clothing function overrides the generalisation about the body-parts of animals.
Additional categories which favour the second locative are: liquids (water), body-parts, clothing materials.

These are the lesser semantic generalisations we can find from looking at the data in detail. In the next chapter we shall only use some of them in the representation of our analysis. Furthermore, it is plain to see that the second locative is to be accounted for not by a purely semantic account, or a purely form-based account. but by a combination of both. In other instances, we must just state that certain items have a second locative, although we do not expect them to.

### 7.4 Conclusion

In the previous sections we have given a broad overview of the phenomena involved in the second locative in Russian. As the reader may appreciate it is of interest, because it combines both morphonological and semantic information. In the next chapter we shall proceed to a formal Network Morphology analysis within the principles and constraints we have set out in chapters two, three and four. More importantly, we shall show that the choice of feature ordering which we motivated on independent grounds now has greater explanatory force when we come to consider the fact that the second locative only occurs in the singular and that there is never any formal difference between the second locative and ordinary prepositional (locative) case for adjectives in Russian. A fact that must be accounted for, as the second locative occurs in modified noun phrases. Our analysis will capture all of these facts, as well as the interdependencies (7.11)-(7.17) and some of the semantic factors we have detailed here.
CHAPTER EIGHT

A Network Morphology Account of the Second Locative

8.0 Introduction

In this chapter we consider the place that an apparently marginal phenomenon, the second locative, has within the system of Russian nominal morphology as a whole. The theoretical interest of the second locative is that it still fits within the general requirement to impose some structure on the relationship between the nominal grammatical categories of number, case and gender. In section 2.4 we considered some ordering constraints on feature specifications. One of the reasons given in chapter two for claiming that number is ordered before case is that the former can influence the number of cases that there are. In Russian the second locative and second genitive cases occur only in the singular, never in the plural. The ordering of features stipulated by the Network Morphology framework is essentially a claim that this is not a purely accidental fact. To an extent, therefore, Network Morphology already makes predictions about the degree to which these exceptional cases may be distributed within number. Of course, there is no absolute stipulation that such cases cannot occur in the plural. The point is that if no ordering is stipulated, one would expect the plural to be just as likely to have these cases as the singular. The limiting of these exceptional cases to one number is claimed by our approach to be non-accidental.

As we have shown in section 7.2.1 with textual examples and informant work, nouns containing a second locative realisation can occur in modified noun phrases. Another important question that we shall answer is why adjectives cannot have a special ending for the second locative. We claim that there can be no specification of a realisation for the second locative for nominals as a whole, because the second locative case is essentially a feature specification which extends the number and standard case specifications which are given at the noun morphological class nodes, and the generalisation of it to the node MOR_NOUN or higher would entail a violation of the Overextended Ancestor Prohibition. In addition to this we claim that there is also a local principle of matching category extensions, which rules out extending adjectival morphological paths with the additional feature required for the second locative, as this would mean that the standard number and case specifications for adjectives could be extended by two different categories: gender or the morphosemantic case categories for the second locative or second genitive. We claim that such conflicts of extension cannot exist for a specific word class, in this case adjectives. The second locative is a sub-case in some regards similar to the...
subgender of animacy. This sub-case further divides the prepositional case, just as the animate subgender further divides the masculine gender in the singular.

8.1 The interdependencies

In section 7.3 we outlined the morphological and semantic interdependencies which favour or disfavour the second locative. Some of these were very fine distinctions, and the number of examples may be too small to draw firm conclusions. There are at least two morphological interdependencies which are necessary conditions for use of the second locative. We restate these again in (8.1) and (8.2).

(8.1)
The second locative may only be realised formally in declensions I and III.

(8.2)
For declension I the noun stem must end in a functionally hard consonant.

The generalisation in (8.1) can only be stated in a framework which accepts that there is some validity to the concept of inflectional class. There is no way that declension III can be isolated from declension II on the basis of gender alone. With the exception of the set collocation vo xmel 'u 'tipsy' (Zaliznjak 1977: 588), the condition in (8.2) must always be fulfilled for a declension I noun to stand a chance of having a second locative ending. We have already noted in the previous chapter that the phoneme /j/ functions as a hard consonant, following Reformatskij (1975). It might be possible for a morpheme-based approach which rejects inflectional classes to couch (8.2) in terms of gender and selection, but it is not clear how such an approach would capture the fact that both the class I and class III realisations of the second locative involve ending stress, as the morphemes would have to be dissociated from each other in order to capture the generalisation in (8.2). By this we mean that two separate morphemes would be required which select for either a hard stem of a masculine noun (for declension I), or select for a soft stem of a feminine noun (for declension II). This creates problems, however, as it would not be possible to capture the generalisation that for both the declension I and declension III nouns the ending is stressed and is the same ending as that for the singular dative. Recall that Network Morphology allows for different layers of realisation to be shared, and that the affixal morphology for class I and class III may be separate from the morphoprosodic morphology. This has already been demonstrated by Brown et al. (1996).

Further to (8.1) and (8.2), which are necessary (but not sufficient) morphological conditions for a noun to have the second locative, there are the two semantic conditions which must also be met.
(8.3)
Every noun which has a separate realisation of the second locative must denote an inanimate entity.

(8.4)
Scalar or unbounded concepts do not have a second locative form.

Any theory which tries to accommodate the second locative must take into account the semantic generalisation (8.3). The generalisation (8.4) is too fine grained a distinction, and we shall use in section 8.2 the distinction between abstract nouns on the one hand and tangible or concrete ones on the other. Note that (8.1)-(8.2) partition nouns in a different way from (8.3)-(8.4). The semantic generalisations obviously range over all of nouns, irrespective of their declension class. The generalisations (8.1)-(8.2) and (8.3)-(8.4) could theoretically account for entirely disjoint sets of nouns. If they did, of course, there would be no nouns with a second locative, as (8.1)-(8.4) are necessary conditions for its existence.

While the other semantic interdependencies which were considered in the previous chapter are perhaps too subtle to be considered for formal representation, there are a number of morphological generalisations which generally hold for nouns with a second locative. Among these is the generalisation about the shape of the stem, given in (8.5).

(8.5)
Nouns with a second locative should have a monosyllabic stem.

We have already discussed the exceptions to (8.5) in section 7.3. In each case the exceptions appeared to inherit the case from a monosyllabic stem which could be considered the semantic head of the construction formed. Related to (8.5) are the generalisations about the stress indices (according to Brown et al. 1996) of second locative nouns. Class I nouns often have pattern C stress, if they have a second locative, and class III nouns have pattern Ci stress, if they have a second locative. This translates to the default generalisations (8.6) and (8.7).
(8.6) 
The stress index for class I should generally be 3.

(8.7) 
The stress index for class III should generally be 2.

It is clear that for certain lexical items it will just have to be stated that they have a second locative which differs from the usual prepositional ending. A formal representation must show that it should not be possible for an animate noun to be assigned such an ending without lexical stipulation. Equally, for a class I to have such an ending when it is functionally soft is ruled out, and the noun *xmel* 'drunken state' must specify in its lexical entry that it has such an ending. As a step toward this, our next task is to explain exactly what type of case the second locative is.

8.2 The Second Locative is a structured case

In chapter two (section 2.4) and chapters five and six (sections 5.2 and 6.4) we pointed out that there are at least two types of fact that account for syncretisms. Certain syncretisms can involve referrals (Zwicky 1985), whereas others are based on underspecification. Underspecification crucially relies on the ordering constraints that we have outlined. We have already seen an instance where the plural number conditions total loss of the gender distinction in Russian. We argued that this is an underspecification type of syncretism. This is because referral-based syncretisms do not involve loss of a category distinction conditioned by a feature of another category. With the Slovene example discussed by Corbett and Fraser (1997) the syncretism between dual and plural for certain cases does not involve a loss of number distinction throughout a particular case (i.e. the singular is still distinct).

We have argued that the second locative is a case in its own right, albeit a marginal one. Furthermore, it is a case whose default realisation is syncretic with that of the prepositional case. This is always true for class II nouns, and more or less true for class IV nouns. Furthermore, we require some way of stating that it never has a realisation of its own with adjectives. What is more, we also need to explain why it is that an adjective, when it modifies a noun which has a different realisation for the second locative, will be assigned prepositional case. As far as I am aware, those theories which treat the second locative as a purely "lexical" case fail to address this. Yet it is not satisfactory just to say that an item is exceptional and assign an exceptional feature to it. It must be explained somewhere why this feature does not generalise and why it is that the realisation overlaps with that of another related feature combination.
Consideration of how to deal with adjective agreement, how to answer the question why the second locative does not generalise, together with the fact that it is contained within a particular number, leads to the conclusion that it cannot involve a referral-based syncretism. Let us consider a possible fact somewhere in the declension class hierarchy which attempts to state that there are two cases, called prep and loc respectively, the first the prepositional (locative) case and the second the second locative case. This fact could be a referral as in (8.8).

\[(8.8)\]
\[
<\text{mor sg loc}> = "<\text{mor sg prep}>"
\]

In order to capture, if not account for, the fact that adjectives do not have a separate second locative realisation, this fact must be placed at the node MOR NOMINAL. At the node N_1 it might be stated that in order to determine the value corresponding to \(<\text{mor sg loc}>\) the information outlined in (8.1)-(8.7) must be evaluated. This approach essentially states that the second locative has exactly the same status as the other cases. However, it has a number of disadvantages. First, there is no reason why adjectives do not differentiate the second locative from the prepositional according to this account. Although it makes the syncretism in adjectives appear accidental, it is not a conclusive argument against a referral-based approach. The second reason for rejecting (8.8) is that it would make the wrong prediction about change, if the referral were stripped away. If there were no (8.8), then the realisation of the second locative would default to the bare stem, rather than to the prepositional case; that is why (8.8) is there, after all. This argues more strongly against assuming (8.8) to capture the prepositional and second locative syncretism. A third reason is that we have no explanation as to why the second locative fails to generalise above the level of nouns. As we shall see, adopting an approach in which the second locative is a 'sub-case' which extends the prepositional case accounts for this failure to generalise in terms of the Overextended Ancestor Prohibition presented in section 4.5. Pre-empting later explanation, we shall argue that the prepositional case has the feature specification in (8.9), and the second locative the feature specification in (8.10).

\[(8.9)\]
\[
<\text{mor sg prep}>
\]

\[(8.10)\]
\[
<\text{mor sg prep loc}>
\]

In chapters five and six we saw that nouns have feature specifications for number and case of the type in (8.9). As the declension class nodes for nouns contain facts where paths contain number and case information as in (8.9), the location of a fact which
contained (8.10) at the node \textsc{MOR\_NOUN} or higher would be a violation of the \textit{Overextended Ancestor Prohibition}.\footnote{Note that the \textit{Overextended Ancestor Prohibition} is defined in section 4.5 in relation to categories. It would be impossible for the specification in (8.10) to generalise, because, in terms of categories, (8.10) extends any \textit{path} which contains \textit{features} which belong to the categories of number and case.}

As we shall see, the structured case approach combines the advantages of the two opposing views of the second locative as either "lexically specified" or as a "true case". The first view accounts for the limited number of nouns with which the second locative occurs, but only by stipulation. A specific feature has to be introduced in order to name the "lexically specified" case, but there is no explanation for why this feature does not generalise. Essentially there is a statement to the effect that the second locative is exceptional, and that is that. This approach also has no explanation for why the second locative will occur with adjectives with standard prepositional agreement. The second locative as "true case" approach, on the other hand, can partially account for the agreement phenomena, as this means that adjectives must have some specification for the second locative, but it fails to account for the fact that adjectives always realise agreement with a second locative by using the prepositional case. Our account, based on the second locative as a structured case, overcomes all of these problems. Unlike the "lexical specification" approach, the structured case approach is subject to the \textit{Overextended Ancestor Prohibition} which explains why the second locative cannot generalise to most nouns. Like the "true case" approach the structured case approach can account for the agreement with adjectives, but is even better because it provides an account of why adjectives use prepositional agreement morphology without ever specifically stipulating the second locative as a case for adjectives.

### 8.3 Representing semantic interdependencies

In the previous section we argued that the facts which deal with the second locative contain \textit{paths} in which the second locative is a structured case. In terms of the representation of this analysis we have already determined what should occur on the left-hand side of the Network Morphology \textit{facts} which deal with this case. In this and the next section we go on to consider the right-hand side of \textit{facts} for the second locative, before going on to consider where these \textit{facts} are to be placed. As semantic interdependencies are independent of inflectional class we shall consider them first and then the morphological interdependencies which relate to inflectional class.
On a practical basis, it is a relatively straightforward task to make use of semantic information about animacy, as this is already provided in the lexicon of the first 1500 most frequent nouns. We assume that semantic animacy, rather than syntactic animacy, is evaluated for purposes of determining the second locative. The essential difference is that semantic information inherent to the lexical item is used to determine a case form, but as the second locative has no agreement effects there is no reason to assume that syntactic animacy need be used. In principle, if the effects of the evaluation do not go beyond the noun itself, there is no reason to assume that a syntactic category is involved. Hence, as the nouns have animacy as an inherent part of their semantics, but adjectives do not, and adjectives do not realise a second locative case, this is another reason to claim that syntactic animacy is not involved.

The first step is to take the lexicon of the first 1500 most frequent nouns and eliminate all of the animates. If we exclude all of the nouns which belong to classes II and IV and all the animate nouns for classes I and III this eliminates just over a half of all the most frequent nouns, leaving approximately over 620 (step one).

In order to see whether other semantic information is of use we need to consider the morphonological interdependencies. If class I nouns which are not functionally soft are eliminated from the count, we obtain 582 nouns (step two). If the set of nouns which are not class I and index 3 or class III and index 2 is eliminated from the 582 nouns, there are 101 nouns left (step 3). Of these 101 nouns, 68 are class I nouns and 33 are class III. Of the 68 class I nouns 30 have a second locative. The 33 class III nouns contain 9 that have a second locative. This means that there are 38 class I nouns and 24 class III nouns which do not have a second locative, but which still satisfy the conditions for having one (still step three). We can further reduce the number of nouns which do not have a second locative and satisfy the conditions by requiring that the nouns be monosyllabic. By doing this we do not exclude further any nouns with a second locative, as those which are truly polysyllabic and have a second locative do not use the expected stress pattern. By requiring that the nouns be monosyllabic we reduce the class I nouns to 50, and the class III nouns to 20. This means that there are then 20 class I nouns and 11 class III nouns which satisfy the requirements but do not have a second locative (step four). Table 8.1 sums up how many nouns are left after step 1 (isolation of inanimate class I and class III nouns), step 2 (elimination of those in step 1 which are soft stem class I nouns), step 3 (isolation of those from step 2 which are either index 3 class I or index 2 class III) and step 4 (isolation of those from step 3 which are monosyllabic).
In table 8.1 we see that step three has a dramatic effect on the number of nouns we are dealing with. However, we also include 38 class I nouns (56% of the 68) which do not have a second locative. Step four (selecting monosyllabic nouns) reduces the number of included nouns without a second locative to 20 (40% of the 50). A final step is to select those of the nouns left in step four which are not abstract. This then would reduce the 50 class I nouns by a further eight, including two which are listed in Zaliznjak (1977: 232 and 543) as occurring in set phrases with a second locative, but which are not included in the list of nouns with a second locative, because they are not marked as P2 by Zaliznjak (1977). These nouns are DOLG 'debt' and ČAS 'hour'. This then leaves 42 class I nouns, of which 30 (71%)

---

2In appendix VIII we find that there are 44 class I nouns which have a second locative among the first 1500 from Zasorina (1977). Of these there are five pairs of nouns which are related lexemes: KRAJ 'country/edge', MOZG 'brain/mind', TOK 'threshing floor/birds mating place', VAL 'shaft/roller (wave)', VERX 'summit/hood (of carriage)'. We treat the meaning of either member of the pair as being 'tangible'. Each pair is only counted once for purposes of totalling the number of second locative nouns. The figure in brackets in the table treats the pairs as separate items, the figure not in brackets excludes one item of each pair.

3Of the 30 out of 39 nouns which have pattern C and a second locative in the first 1500 we have to treat ROD 'kin' as tangible rather than abstract. The word MOZG as 'mind' also has to be considered a body part rather than abstract. The word GOD 'year' is treated as abstract, but was not included in the count of 26 lexemes with pattern C, because it was given with the alternative pattern Ci in the lexicon of 1500 nouns.

4It should be noted that these two nouns are included in the count of 20 class I nouns in step four that should not have a second locative.
have a second locative. By step four the number of class III nouns which are left is 20, of which nine (45%) have a second locative. Introducing the requirement that the noun be abstract reduces the 20 class III nouns to 16, of which the nine with second locative constitute 56%.

In sum, we have reached a point at which we account for 39 (78%) of the 50 (55) nouns of both class I and III which have a second locative. We do this at the expense of having to stipulate that 19 nouns do not realise the second locative. It should be noted that the potential for this last group to increase when projected onto an even larger corpus is not so great. First, the stress patterns involved limit the potential membership (394 pattern C class I nouns, and 113 pattern Ci class III nouns). Second, we can reasonably expect that the less frequent nouns are with this pattern, the less likely they are to be monosyllabic. Third, where pattern C may be productive in class I nouns is in the area of names for members of a profession, which will be ruled out, because of their animacy.

As we saw, body-parts figured prominently among those nouns which had a second locative, and we can add a further two nouns to our total of 39 by including nouns which denote body-parts and are ending stressed: lob 'forehead' and rot 'mouth'. We have a cline from items that are immediately perceptible to the language user, namely their own body-parts, through things which are perceptibly immediate and concrete to things which are more abstract. In order to account for this, we shall introduce a semantic category of 'tangibility' with, for our purposes, three values, body_part, tangible, abstract. A finer grained distinction could be made, and on occasions we are forced to make arbitrary decisions regarding whether something is abstract or tangible, when these concepts could also be divided up into matters of degree and context. As an instance, we find that we must consider the lexeme č'ast 'part' to denote an abstract concept. Otherwise it would be possible for it to have a second locative form. The default meaning for any lexical item is that it denotes a tangible thing.

By 'body-parts' we mean the body-parts of humans. The body-part nouns also have to be monosyllabic to rule out lexemes with polysyllabic stems such as jazik 'tongue' occurring with a second locative. The difference from other tangible items is that they appear to have a second locative with pattern B. One problem for this is the noun stem volosók 'little hair' which is technically functionally monosyllabic, because it has polnoglasie and a fleeting vowel.
In (8.4) we claimed that items which are unbounded or scalar do not have a second locative. Boundedness is very difficult to define, and we shall not use it here for our analysis. It turns out that the distinction between scalar and non-scalar items is of very little use, as nouns which are scalar in meaning tend to be abstract.

As the default value for 'tangibility' is tangible, a class I noun which is inanimate, monosyllabic and has pattern C stress could have a second locative form. Note, however, that there are 394 such nouns according to figures in Brown et al. (1996), based on Zaliznjak (1977). Furthermore, a number of these nouns are animate and polysyllabic. Therefore, although our theory would probably overgenerate nouns with a second locative form if projected beyond the first 1500 most frequent lexemes, it still predicts that the number of possible nouns with a second locative form is highly restricted. As we order the evaluation of semantics before that of morphological information, the fact to be found at the node N_I should look something like (8.11).

(8.11)
\[
<mor sg prep loc> == \text{PREP LOC}:<"<sem animacy>""<sem tangibility>"" ... \]

Note that (8.11) refers to an interdependency node PREP_LOC where it is stated how the second locative may be realised and when a noun may realise it. We have already considered the morphological interdependencies in order to determine the semantics of assignment of a second locative form. In the next section we consider how to deal with these morphological interdependencies.

8.4 Representing the morphological interdependencies

Purely in virtue of having adopted an approach to inflectional morphology which treats inflection classes as nodes within an inheritance hierarchy we already have a means for dealing with the relationship between the second locative and declension class in (8.1). The fact which pairs the path \( <\text{mor sg prep loc} > \) with the semantic and morphonological evaluations required to determine the form of the second locative is placed at the node N_I. The node N_III then refers to it by a network relation. The reason for assuming that N_III refers to N_I is the much smaller number of nouns in N_III which have a second locative. In fact, because of the Overextended Ancestor Prohibition, it can be placed no higher than this, as the feature specification (8.10) extends paths beyond number and the standard case distinctions. Although it would be possible to stipulate a fact about the second locative at each of the inflectional class nodes under MOR_NOUN, with the exception of N_O, our approach already demonstrates that this case can never have a default realisation for all nouns. This again is an advantage over the 'lexical case'
approach, which has no explanation for why the feature that it uses for the second locative cannot generalise across the nominal system.

The contrast between functionally hard and functionally soft consonants is used in another part of Russian noun morphology, namely the genitive plural, and this information can be used to limit further the group of class I nouns which may take a second locative. The semantic interdependencies apply to nouns from both class I and class III. As class III nouns are all functionally soft, we need a way of dividing the two evaluations. There are two alternatives.

(8.12)
Alternative One
N_I and N_III contain a fact which evaluates the same information, and refer to the same node for the realisation of the second locative.

(8.13)
Alternative Two
N_I and N_III contain facts which evaluate different information and refer to different nodes for the realisation of the second locative.

The second alternative in (8.13) would allow us to overcome the problem of referring to hardness and softness at the same node and thereby either excluding class I or class III. However, it would have the undesirable effect of making the important fact look accidental that for both classes the second locative is realised by an ending-stressed form which is otherwise the same as the singular dative. The first alternative in (8.12) is to be preferred, but this requires a means of differentiation of the remit of statements about functional hardness or softness. Such a means already exists, formal gender. It should be noted at this stage that this is another motivation for adopting the concept of formal gender, as it is used for other purposes in the assignment of syntactic gender (Fraser and Corbett 1995) and in the determination of expressive morphology (Hippisley 1996). Evaluating formal gender after the semantic categories mentioned therefore enables us to make the division between class I and class III without losing the generalisation that their second locative is realised by a stressed variant of the singular dative. Formal gender is also necessary when stress indexation is taken into account, as class I and class III differ in terms of preferring different stress indexes, as was demonstrated in section 7.3. So far the information to be evaluated for the second locative is as in (8.14).

(8.14)
\[
\text{<mor sg prep loc> ==}
\text{PREP_LOC:< "<sem animacy>" "<sem tangibility>"}
\text{ "<mor formal gender>" "<mor stem hardness>" ...}
\]
In (8.5) it was stated that the second locative applies only to nouns which have monosyllabic stems, with the exception of stems with polnoglasie, such as bereg 'shore'. Stems with polnoglasie are analogous to functionally soft or hard consonants which are not actually phonologically soft or hard, such as the palatoalveolar fricatives and jot. We treat these by giving different values for <phon stem hardness> and <mor stem hardness>, where the path with the mor hierarchy identifier is the functional variant. Note that in every instance the discrepancy between the functional-morphological level and the phonological is licensed by specific details of the language. Functionally soft consonants which are phonologically hard cannot have a phonologically soft counterpart, and the functionally hard but phonologically soft jot cannot have a phonologically hard counterpart. Functionally monosyllabic stems are those where a liquid occurs between two mid vowels of the same quality.

By default any noun with a stress index value other than 1 will be monosyllabic. There is a fact stated at the node MOR NOMINAL which evaluates the functional syllability of noun stems. It is as in (8.15).

\[(8.15)\]
\[
\text{MOR NOMINAL:}
\]
\[
\quad <\text{mor stem syllability}> == \text{SYLLABICITY:<"<index>"} >
\]

(8.15) states that evaluation of the (stress) index value will partially determine whether a noun stem is monosyllabic or polysyllabic. The node SYLLABICITY states that a noun with a (stress) index 1 will by default be polysyllabic. As 1 is the default index, this means that being polysyllabic is the default. Where a noun is assigned any index other than 1 it will be monosyllabic. This all means that any noun which lexically specifies an index, but which is not monosyllabic, must specify that it is polysyllabic. Hence, the noun adres, which is index 3 because it has pattern C stress, must specify that it is polysyllabic. A noun such as gr'az 'dirt', which is monosyllabic but has index 1 must specify that it is monosyllabic. Of course, this approach can be replaced by a more satisfactory one in which phonological information is encoded in a non-redundant manner in the lexical entry (see Cahill 1991; Gibbon 1992). As we are concentrating on different levels of information to account for the second locative we cannot afford to concentrate on this one area alone. Including information about syllability means that the fact for the second locative at N-1 is now as in (8.16).
All of the semantic and morphonological information that we would wish to evaluate is included in (8.16) apart from (stress) indexation. This is added to (8.16) to complete the fact located at N-1, referred to by N-111, and means that (8.16) finally takes the form of (8.17).

(8.17) 
\[
\text{PREP-LOC:} < \text{<mor sg prep loc>} == \text{PREP_LOC:< "<sem animacy>" "<sem tangibility>"} \\
\text{"<mor formal gender>" "<mor stem hardness>"} \\
\text{"<mor stem syllabicite>" "<index>" >.}
\]

Cursory examination of (8.17) shows that a noun from class I or class III must undergo a lot of evaluation to determine the form of its second locative. A major consideration is stating that the overwhelming majority of class I and class III nouns have a form the same as the ordinary singular prepositional. This is captured in the way that the realisation of the forms is stated at the interdependency node PREP_LOC.

The first fact at the node PREP_LOC states that the default realisation for the feature specification <mor sg prep loc> is the realisation for <mor sg prep>. Hence stripping away the more complex facts at the node PREP_LOC will always lead us back to the standard realisation of the prepositional singular. This basic fact is given in (8.18).

(8.18) 
\[
\text{PREP_LOC:} \\
\text{<> == "<mor sg prep>"}
\]

If a noun does not overcome the large number of hurdles required for it to have a different realisation of the second locative, then it will have the expected realisation for the class in question. The next fact that is required states that the second locative will be the singular dative plus stress. This is given in (8.19). \(^6\)

\(^6\)The symbol combination "," indicating overlap and word stress, corresponds to @ \" in the fragments in the appendices. For practical reasons the @ symbol was used instead of the overlap operator and "," is quoted out by the back-slash, because it is a reserved symbol.
(8.19)

\[
\text{PREP\_LOC:}
\]
\[
< > == "<mor\ sg\ prep>"
\]
\[
<\text{mor\ sg\ prep\ loc}> == "<\text{mor\ sg\ dat}>"'
\]
\[
...
\]

Note that the imbalance in the feature specification between the left-hand \textit{path} and the right-hand \textit{path} can be accounted for by the fact that the stress realises the last feature of the left-hand \textit{path}, namely loc.\textsuperscript{7} Next we are required to say that nouns which denote body parts and have monosyllabic stems will have a second locative. This has to be done by stipulating two \textit{facts} at the node \text{PREP\_LOC}. The reason for this is that we have divided up the nouns into the group of soft-stem feminines from class III and the group of hard-stem masculines from class I. Two further \textit{facts} are introduced. They state that the group of monosyllabic hard-stem masculines from class I which denote body parts and have index 3 will have a second locative, and that the group of monosyllabic hard-stem masculines from class I which denote body parts and have index 2 will behave in the same way as those which have index 3. These two \textit{facts} are added in (8.20).

(8.20)

\[
\text{PREP\_LOC:}
\]
\[
< > == "<mor\ sg\ prep>"
\]
\[
<\text{mor\ sg\ prep\ loc}> == "<\text{mor\ sg\ dat}>"'
\]
\[
<\text{inanimate body_part masc hard monosyllabic 3}> == '<\text{mor\ sg\ prep\ loc}>
\]
\[
<\text{inanimate body_part masc hard monosyllabic 2}> == '<\text{inanimate body_part masc hard monosyllabic 3}>
\]
\[
...
\]

Next we have to state that the monosyllabic soft-stem feminine nouns from class III which denote body parts behave in the same way as the group of monosyllabic hard-stem masculine nouns which denote body parts. This is done by adding the \textit{fact} in (8.21).

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\textsuperscript{7}In clause (iii) of the \textit{Referrals Principle} in section 4.6 we state that the left-hand \textit{path} and the right-hand \textit{path} must be of the same length. Here we see that a qualification of this is that the left-hand \textit{path} feature which causes this imbalance is realised by stress on the right-hand side. It should also be noted that the first \textit{fact} at \text{PREP\_LOC} is not a \textit{referral} under the definition in section 4.6, because the left-hand \textit{path} is empty and does not begin with a hierarchy identifier. \text{PREP\_LOC} is, of course, an interdependency \textit{node} which is not part of the morphological hierarchy as such.
Two further facts need to be added before the node PREP_LOC is complete. The first of these facts accounts for the generalisation that the second locative for class I nouns is generally associated with the stress index 3. In other words, a class I noun which is monosyllabic, has a hard stem together with pattern C stress (stem stress in the singular; ending stress in the plural) and denotes a tangible inanimate entity is likely to have a second locative ending -ũ. This corresponds to the steps given in table 8.1. This fact is added in (8.22).

Finally, in (8.23) we add the fact that class III nouns which are monosyllabic and have an index 2 should have a second locative ending in stressed -ũ. This information is added in (8.23).

---

8 The order of evaluation does not correspond to the order of steps we give in table 8.1, although this has no effect on the outcome. Here part of step one follows from the stipulation of evaluation only for class I and class III. The other part is the evaluation of animacy. Evaluation of whether a noun denotes an abstract, tangible thing or body-part is a step not included in table 8.1.
Having now added all of the facts required at the interdependency node PREP-LOC and the facts referring to that node at N_I, which is referred to in turn by N_III, we are now in a position to consider the architecture of the noun portion of the nominal hierarchy based on the N_O analysis. This is given in figure 8.1.

![Diagram](image)

**Figure 8.1:** The interdependency node PREP-LOC connected to N_I and N_III (via N_I)

The approach to the second locative we have outlined does not allow for this case to be generalised to the level of MOR_NOUN or higher. It would still be possible for a monosyllabic nonce noun to take a second locative ending if it met the requirements. For class I this would mean that the noun would be monosyllabic, would have a hard stem, take pattern C stress and not be animate or abstract in its meaning. For class III the same semantic restrictions would apply, but the noun should have pattern Ci stress. As we know that this pattern is being lost for this class, the likelihood of such a class III noun arising is not very great.

Another important point to note about the second locative in our treatment is that it involves a more specific specification than the other cases. In particular this means it cannot be a default for nouns and, as we shall show, for nominals in general.
8.5 Case Assignment for Adjectives

Both the lexical stipulation approach to the second locative and the second-locative-as-case approach are problematic when one comes to consider the case assignment for adjectives and nouns when the noun has a second locative form. The lexical stipulation approach has no explanation for why adjectives are assigned the prepositional case when they modify a noun which has a second locative form. As the second locative is marked as a purely idiosyncratic lexical feature, there is no reason why it should be the prepositional case as opposed to any other. Furthermore, there has to be a mechanism whereby this requirement for prepositional case is stated for adjectives accompanying a noun with a second locative. Stating that all the examples are lexical collocations is no good, as then it is not possible to account for the adjectival forms at all. As we have seen, there is indeed a cline along which some nouns absolutely require the second locative with the appropriate preposition and others only have it in certain set phrases. The lexical stipulation approach has no answer for the former type, such as bereg 'shore'.

The second-locative-as-case approach is in a much better position when it comes to accounting for adjectival case assignment. As there is such a case feature, adjectives must have a form to realise it. The problem here is more subtle. Is it legitimate to claim the existence of such a case for a word class which does not have its own realisation for this case? For nouns, for example, we know that the second locative has a separate form in certain instances. This is an important criterion for establishing case. The important question here is how to establish the link between the second locative and the prepositional case.

We have argued in sections 2.4 and 5.2 that underspecification should be used to account for syncretism where there is a total loss of a distinction conditioned by another feature. For instance, it was argued that the feature 'plural' conditions the loss of gender distinction in Russian. This argument was used to support the ordering of gender (for adjectives) after number and case. It can also be applied to the second locative. This case is a feature combination which is a more specific instance of the prepositional case. The reasoning which lies behind this is that loss of the second feature which appears in the specification prep loc is conditioned by two other categories. First, the feature pl conditions loss of the feature loc, as well as the feature quant used for the second genitive. So there is total loss of the distinction in the plural. Furthermore, the other case features also condition this neutralisation. Hence, our earlier argumentation regarding the ordering of features relative to each other comes into play here.
Because the second locative is treated as a structured case we have an answer to the more subtle problem posed for the second-locative-as-case approach. The link between the second locative and the prepositional case is that the second locative is a more specific version of it. It therefore follows that the singular prepositional morphology of adjectives is used to realise it. More than this, the very specific nature of the second locative explains why it cannot be generalised to nominals as a whole. This is illustrated in figure 8.2, where the more specific feature specification would be found at a higher node than a less specific one, thereby violating the Overextended Ancestor Prohibition.

![Diagram](image)

**Figure 8.2:** Generalisation of the second locative leads to OAP Violation

This is not the end of the story, however. It might be thought that one could add a path `<mor sg prep loc>` at one of the adjective declension nodes we have introduced in chapter six. This could be done either by specifying a value for that path at the adjectival node in question, or by referring to the node N_I or N_III for the value corresponding to that path. This would be allowed by the Subprinciple of Information Maintenance in section 4.7, as the path would not be referring to its extension at N_I or N_III for a value.

This possibility should be excluded by a local principle of matching category extensions. The principle is local, because it only involves comparison of paths at a particular node. By matching category extensions we mean that a specific path can only be extended by the same category for a given node. In other words, no path may have extensions which involve features of different categories. As there are no other extensions of `<mor sg prep>` and `<mor sg gen>` than `<mor sg prep loc>` and `<mor sg gen quant>` (the second genitive), these extensions are allowed. For
adjectives, on the other hand, the path <mor sg prep> already has an extension <mor sg prep fem>. Given this local principle, it is not possible to specify the morphosemantic features loc or quant as extensions of <mor sg prep> or <mor sg gen>, because this would conflict with the gender extension found at the adjectival nodes. This means that it is just not possible for the second locative to be realised by adjectives.

Consider the prepositional phrases in (8.24) and (8.25), given in phonological transcription.

(8.24)
na prot’ivopoložn-om bereg-û
on opposite-SG.PREP shore-SG.PREP.LOC
'on the opposite shore'

(8.25)
v et-om gorod-e
in this-SG.PREP town-SG.PREP.LOC
'in this town'

In both (8.24) and (8.25) the features prep and loc are head features of the NP subcategorised for by the prepositions v and na. It is clear from the approach outlined here that even those nouns which do not have a second locative, in the sense that they do not have one which is separately realised from the prepositional case, do have one formally (i.e. in terms of their features). It is just that these features are realised by the morphological default for the prepositional case. The point is that loc does not obey the complete marking requirement (Moravcsik 1995: 474) that a case be marked on each constituent of the NP, which the standard Russian cases obey.

Do all nouns have a second locative? Obviously, if this question is referring to the form of nouns, then the answer is a resounding no. If it is referring to the feature content that nouns realise, then the answer is yes. The point is that for most nouns the realisation is provided by the less specific default for the prepositional case. On the other hand, it is not clear that adjectives even have a second locative in terms of features. In fact, as we have argued, they cannot provide a morphological realisation for the second locative feature specifications. because certain principles make this impossible. In particular, the Overextended Ancestor Prohibition does not allow for the generalisation of the feature specification to nominals, and the local principle of matching category extensions means that it is not possible for adjective declensions to contain facts about this case, because Russian adjectives realise
(feminine) gender, and because gender is ordered immediately after the standard case distinctions.

8.6 Conclusion

In this chapter we have presented a new way of looking at the second locative in Russian. In contrast with approaches such as Fowler (1987), we claim that it is a case, following Comrie (1986; 1991). However, our approach to the second locative as a structured case has a number of advantages which mean that we can account for those aspects which might indicate that it should be treated as purely exceptional.

As the second locative is treated in terms of the feature specification \(<m o r \, s g \, p r e p \, l o c>\) it cannot be generalised to nouns as a whole, because it would violate the Overextended Ancestor Prohibition. The introduction of a local principle of matching category extensions accounts for why it can never exhibit independent morphological realisation among adjectives. This gives our approach the advantage of the lexical stipulation approach in terms of saying that the phenomenon in question is exceptional or marginal. However, it is much better than this, because it provides us with a reason why the second locative cannot be shared by adjectives, rather than merely stating this as a lexical fact.

Neither the second-locative-as-case approach or the lexical stipulation approach can account for the occurrence of this case only in the singular. More subtly, there is no account for why there are quirky variants only of the genitive and prepositional in the singular. By adopting an approach in which we are required to order different categories in terms of the influence that one has on the other we are in a position to answer this question too. Singular number conditions the presence of the second locative, and second genitive, and the quantificational and locational ambiguity in the genitive and locative further conditions the presence of the morphosemantic case feature. This ordering is also partly responsible for the lack of generalisation of these cases, in particular because of the clash that occurs with the gender category in adjectives. Hence, our approach has an additional sophisticated benefit that neither of the two approaches have.

The structured case approach also provides a prediction about the direction of change, which is intuitively obvious but not captured by mere lexical specification. That is, because the second locative is a more specific variant of the prepositional case, it is predicted that the second locative form will be replaced by the prepositional form. If we resort to specifying the second locative by means of a lexical feature, this intuitively obvious insight is not captured.
Finally, by adopting the structured case approach to the second locative, we overcome the major problem that confronts any lexical stipulation approach. Unlike our analysis, it is not able to account for the examples in section 7.2.1 where modifying adjectives will realise the prepositional case when they occur with a noun which has the second locative. In order to overcome this problem it would be necessary to state as a syntactic rule somewhere that adjectives use the prepositional case when they co-occur with such a noun in an NP. Reference by a syntactic rule to the idiosyncratic lexical feature for the second locative in this instance would be highly undesirable and undermine the view of it as purely "lexical". This also speaks for the approach outlined here.

In this chapter we have shown that it is possible to account for exceptional items and that the exceptionality can be understood in terms of the general system in which it is embedded. Our account goes some way toward providing an understanding of why particular parts of the system are exceptional. Its representation in DATR in appendix XI means that the claims we make have been tested computationally.
CHAPTER NINE

Conclusion

9.0 Introduction

In this thesis it has been argued that morphology is a valid level of linguistic structure in its own right, with principles which differ from those of syntax. Morphology, both word-formational and inflectional, is susceptible to exceptionality, much more so than syntax. It is this susceptibility which makes default inheritance based approaches to morphology desirable.

9.1 Morphological Principles

Given that morphology contains exceptionality, a valid framework for rigorous morphological description must provide principles which can be applied to account for varying degrees of exceptionality. Furthermore, those principles should interact in an interesting way with typological generalisations about the relationship between particular morphosyntactic categories. Also, as morphological exceptionality is accounted for by appeal to defaults, we should have some account of what can and cannot be a default. Or at least, we should have some account of what choosing a particular default means in terms of predictions for the rest of the system.

In chapter two we imposed an ordering on the features for nominal morphology. This ordering ties in with the concept of trigger or conditioning features found in work such as Carstairs (1984). Morphological constraints of this type are typological. Some may not be universal. For instance, the relationship between number and case may not hold for a small group of languages, such as Koryak (Žukova 1972), where the differentiation of singular, dual and plural only occurs for the absolutive case. Others, such as the relationship between number and gender, we would claim are universal. Typological constraints of this type are predictive, but we should distinguish them from ones which are more integral properties of the framework. As with any attempt to describe and make predictions about phenomena in the world we may have to abandon or revise these constraints. This is only natural. The important point is that we have predictions which arise from particular theories expressed within the framework. We can modify or abandon these theories if and when they prove inadequate.

Following on from the typological constraints are other principles of the framework which allow us to make interesting predictions about sharing of morphology. As we conclude in the next section, our constraints also allow us to make predictions about plural morphology in Russian. This follows from the
Overextended Ancestor Prohibition. This principle, which is Paninian in nature, places restrictions on the type of morphology which can be a default. We have shown in this thesis that there is a connection between trigger features and the sharing of morphology between word classes.

Another important type of principle for morphology is one which states the extent to which one class may be an instance of another class. Network Morphology provides a principle of Generalisation Violation which places a limit on the extent to which default information of the same specificity may be overridden. A principle of this kind is desirable from the point of view of determining how very similar classes are related. A morphological framework should also have something to say about how things such as referrals are to be constrained, and when they are to be used instead of underspecification. The framework we have outlined here provides principles such as the Referrals principle and the Intra-hierarchy Network Relations Principle to constrain the use of this type of representation. Following from this we also made the prediction that where adjectives realise number, case and gender, the directionality of sharing endings between nouns and adjectives always has to be from nouns to adjectives.

9.2 Network Morphology

In chapter two we illustrated the various types of entity made use of within the Network Morphology framework. We claimed that morphology itself could be constituted of various orthogonal hierarchies, such as the hierarchy of lexemes and the hierarchy of inflection. These hierarchies, constituted of nodes connected by hierarchy relations, are connected by network relations. We also discussed the ordering of attributes within the specification required for a path, and stated that this was guided by typological considerations. Hence, for many languages, including Russian and other Slavonic languages, number is ordered before case, as witnessed by the conditioning of the exceptional cases by singular number. In turn, gender, which is only an inflectional category for adjectives, is ordered after number and case, because plural number triggers loss of gender distinction, and oblique cases in the singular fail to distinguish masculine and neuter gender. This ordering of features then interacts with other principles of the framework to determine possible theories. An interesting claim relates to the 'trigger features' of Carstairs (1984). The prediction is made, for instance, that where a particular feature, such as plural, triggers the neutralisation of particular distinctions, such as those for gender, this morphology is most likely to be shared. By shared we mean that related word classes can make use of the same morphology. In Russian we see that plural morphology is shared by both nouns and adjectives for this reason.
One of the interesting questions related to the default nature of morphology is the degree to which a morphological class can be a member of another class. This question is answered within the Network Morphology framework by a principle of Generalisation Violation which is essentially a claim that no less general morphological class can differ from the more general specification by more than one feature specification of the same specificity. This played a significant role for the two different theories of Russian nominal morphology outlined in this thesis, bringing the relationship between noun classes and the morphology of nominals as a whole.

9.3 Different Theories of Russian Nominal Morphology

In chapters five and six we considered two different theories of Russian nominal morphology, theory A and theory B. Both of these theories could be expressed within the Network Morphology framework. We argued that theory B is to be preferred over the theory A in terms of the predictions it makes. The framework, by allowing for a choice between these theories, shows us which claims about morphological phenomena within Russian go together.

One interesting point that arises from comparison of the two theories is that the treatment of class I and class IV as related under an N_O class (theory B) is connected with the morphology of the less general adjectival class to which adjectives such as otcov 'father's' belong not being a default for nominals. If we wish, on the other hand, to emphasise the more-abstract, because syncretism-based, sharing which is to be found in classes II and III (theory A) we find that this goes hand in hand with the claim that the singular genitive and singular dative endings of classes I and IV are defaults for nominals. This is because trying to share these endings for classes I and IV at MOR_NOUN would lead to Generalisation Violation matches with the node N_AI. Hence, these realisations must be pushed up further to the MOR_NOMINAL node. We argued that theory B is to be preferred, but an important point is that the framework shows us connections between facts about nominal morphology that would not otherwise be made. Claiming that there is some reality to an 'o-stem' class means claiming that the otcov type of adjective is highly exceptional. Claims of this type, it appears, probably have not been made before about Russian nominal morphology. It can be seen that Network Morphology framework allows us to compare theories.

Given our assumptions about attribute ordering, the fact that all the adjectival classes have the same realisation for the singular dative feminine and singular genitive feminine also entails with it a prediction. The realisation of the singular dative and singular genitive masculine and neuter in the otcov type will involve loss of the noun-like ending by one gender before another, because the syncretism has to be referral-based, or would otherwise violate the Overextended Ancestor Prohibition.
because the more general statements about the realisation of the singular dative feminine and singular genitive feminine would otherwise extend a path in a fact which expressed the syncretism by means of underspecification. Again, we see that the whole approach relates the position of particular more exceptional parts of morphology with statements about more general morphology.

9.4 The Exceptional within the General

We further illustrated the benefits of our approach to Russian nominal morphology by showing that it had a principle-based account for the exceptionality of one of the minor sub-cases in Russian, namely the second locative. We contrasted two basic approaches to the second locative, one which accepts that it is a case, the other which treats it purely in terms of lexical stipulation. We showed that the former was to be preferred over the latter, because the latter approach had no account of why the second locative was exceptional and could not generalise, and because the lexical stipulation approach has no account for why adjectival agreement morphology would always follow the standard locative (called prepositional by us). The agreement morphology of adjectives is also a problem for the second locative as case approach, if the second locative is not treated as having a structure itself. We argued that the second locative can be accounted for by giving it the feature specification <mor sg prep loc>. This feature specification is more specific than the feature specification <mor sg prep> of the standard prepositional case. As there is a feature specification <mor sg prep> at the N_III node, the specification of <mor sg prep loc> at the MOR_NOUN node would be a contravention of the Overextended Ancestor Prohibition. In addition we have an account for why adjectives use the standard prepositional case morphology to realise the second locative. There can be no feature specification <mor sg prep loc> at the MOR NOMINAL node, because this would violate the Overextended Ancestor Prohibition, owing to the existence of the specification <mor sg prep> at MOR_NOUN and N_III. Furthermore, our ordering of attributes allows us to make the claim that it is singular number which triggers the presence of extra, exceptional cases, such as the second locative and second genitive. Again, our approach allows us to place more exceptional facts about the morphology of a particular language within the more general system that obtains.

9.5 Future Prospects

The investigation of Russian nominal morphology presented here has benefited from being checked for consistency to see if the theories in question do indeed derive the correct forms. All three (theory A, theory B and the modified second locative version of theory B) have been checked on the first 1500 noun
lexemes to be found in Zasorina (1997). The fragments of these theories are to be found in appendices IV, VI and XI, with example lexical entries for adjectives, pronouns and nouns in appendices XII, XIII and XIV. Example theorems from the final theory are given in appendices XV, XVI and XVII. This therefore means that we can claim that they are at least descriptively adequate theories of a significant proportion of Russian nominal morphology. Currently the principles outlined in this thesis are axioms which partially determine the representation of particular morphological facts within DATR. The aim of this thesis has been to express certain theories of Russian nominal morphology using DATR, rather than develop a formalism, but a sound further step would be the implementation of these constraints on DATR representations. Two approaches suggest themselves. One would be to develop a new formalism which naturally incorporates the constraints and uses DATR as an implementation language. The other is to build the constraints into the DATR compiler.

Within Network Morphology progress has already been made on looking at other typologically similar languages, such as Polish (Brown forthcoming) and Bulgarian (Brown 1997 a), as well as more diverse ones, such as Central Alaskan Yup'ik Eskimo (Brown 1997 b). This work involves further study of the relationship between grammatical categories other than number, case and gender. In Yup'ik, for example, the marking of person on possessed nouns has to be taken into consideration.

9.6 Summary

It has not been the purpose of this thesis to take a stroll through the varied morphological phenomena of the world's languages and give a superficial analysis of all of them. Instead, we have concentrated on just one language, namely Russian. This is because morphology is by its very nature prone to varying degrees of exceptionality. One of the tasks of morphological typology is to understand why particular areas of the morphology of a language are exceptional, and therefore why others are more general. We have shown how a detailed analysis of Russian reveals relationships between morphological classes and default nominal morphology, such as the choice between the o-stem class and the -a and -u endings as nominal defaults, and why a particular case, such as the second locative, because its information structure is more specific than the default for nouns, cannot generalise. Having understood the place of the exceptional within one language, we are much better placed to understand the relative value of particular morphological phenomena in a typological survey. It is in this sense that this work is a contribution to morphological typology.
REFERENCES


LITERARY WORKS CITED


APPENDIX I

Phonological transcription

Halle (1959) used Russian as the classic example of the supremacy of features over phonemes. The phonological rules that we assume here can be reformulated in terms of phonological features. We give three important phonological rules, then an illustrative list of examples for transcription, followed by an inventory of phonemes. These phonemes should be understood as the underlying minimal feature specifications required for a lexical entry or morphological operation. Throughout this thesis we have stuck to the phonological transcription, as phonological feature specification would have made our representations harder to follow, and indeed little would have been gained for the points we wish to make.

The Rules

1. [i] -> [y] after a hard consonant.
2. C -> C' before /e/ (where C is not an affricate or palatoalveolar).
3. K -> K' before /i/ (where K is a velar).

Rule 1 shows that we follow the 'Moscow School' in assuming that [i] and [y] are manifestations of the same phoneme. Note that rule (3) should take precedence over rule (1), but we would not wish to specify (1) as never applying to velars. As Alan Timberlake (personal communication) has pointed out, there is a hierarchy of application of phonological rules in Russian, and the palatalisation of velars follows this hierarchy:

mor. int. > deriv. > prefix > prep. > words

(boundaries)
The palatalisation of velars occurs up to prepositional boundaries. At this point we revert back to the general rule (rule 1) which backs the phoneme /i/ after any consonant, including velars. We assume that rule 3 takes precedence over rule 1 up to preposition boundaries, because its input is more specific.

*Example Transcriptions*

(i) Rule 2 would give the palatalisation of segments before /e/ automatically. Our lexical entry for forms containing /e/ therefore do not need a marker for softness - i.e. *student* 'student'. The phoneme /ɛ/ is marked soft, as it is soft underlyingly, and is not palatalised by by rule 2, as it is an affricate.

(ii) Our rules assume that consonants are underlyingly either hard or soft. We therefore mark a consonant with ' in its lexical entry, or phonological specification for a formative, if it is soft.

The transliteration follows that of the Slavic and East European Journal.

<table>
<thead>
<tr>
<th>Transliteration</th>
<th>Gloss</th>
<th>Transcription</th>
<th>Reason</th>
<th>Russian</th>
</tr>
</thead>
<tbody>
<tr>
<td>igrat'</td>
<td>'to play'</td>
<td>igrat'</td>
<td>[i] is default for /i/</td>
<td>играть</td>
</tr>
<tr>
<td>knigi</td>
<td>'books'</td>
<td>kn'igi</td>
<td>/n'/ marked as underlyingly soft; rule 3 applies to /g/</td>
<td>книги</td>
</tr>
<tr>
<td>komnate</td>
<td>'to room'</td>
<td>komnate</td>
<td>rule 2</td>
<td>комната</td>
</tr>
<tr>
<td>lisa</td>
<td>'fox'</td>
<td>l'isa</td>
<td>first C underlyingly soft</td>
<td>лиса</td>
</tr>
<tr>
<td>lisica</td>
<td>'vixen'</td>
<td>l'i s'ica</td>
<td>second C softened by word-formination operation</td>
<td>лисица</td>
</tr>
<tr>
<td>pir</td>
<td>'feast'</td>
<td>p'ir</td>
<td>C underlyingly soft</td>
<td>пир</td>
</tr>
<tr>
<td>Transliteration</td>
<td>Gloss</td>
<td>Transcription</td>
<td>Reason</td>
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<td>-----------------</td>
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<td>---------</td>
</tr>
<tr>
<td>p'ju</td>
<td>'(I) drink'</td>
<td>p'ju</td>
<td>soft sign between C and V graphemes indicates /j/</td>
<td>пьёю</td>
</tr>
<tr>
<td>s'jezd</td>
<td>'congress'</td>
<td>sjezd</td>
<td>hard sign between C and V graphemes indicates /j/</td>
<td>съезд</td>
</tr>
<tr>
<td>sygrat'</td>
<td>'to play' (pf.)</td>
<td>sigrat'</td>
<td>rule 1</td>
<td>сыграть</td>
</tr>
<tr>
<td>syr</td>
<td>'cheese'</td>
<td>sir</td>
<td>rule 1</td>
<td>сыр</td>
</tr>
<tr>
<td>žit'</td>
<td>'to live'</td>
<td>žit'</td>
<td>rule 1</td>
<td>жить</td>
</tr>
</tbody>
</table>

**Phonemes**

1.0 Vowels

\[/a/ /e/ /i/ /o/ /u/\] (we ignore reduced vowels not under stress)

tally: 5

2.0 Consonants (tally 32)

2.1 Plosives

2.1.1 Bilabial

\[/p/ /b/\]

\[/p'/ /b'/\]

tally: 4

2.1.3 Velar

\[/k/ /g/\]

<p>| | |</p>
<table>
<thead>
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<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>tally: 2</td>
</tr>
</tbody>
</table>

1 Velars are not marked for softness, as this is automatic before non-low front vowels.
2.1.2 Dental
/t/ /d/
/t'/ /d'/
tally: 4

2.2 Nasals

2.2.1 Bilabial
/m/ /m'/
tally: 2

2.2.2 Dental
/n/ /n'/
tally: 2

2.3 Fricatives

2.3.1 Labiodental
/f/ /v/
/f'/ /v'/
tally: 4

2.3.2 Dental
/s/ /z/
/s'/ /z'/
tally: 4

2.3.3 Palatoalveolar
/s/ /z/
tally: 2

2.3.4 Velar
/x/
tally: 1

2 The palatoalveolar fricatives /s/ /z/ are hard and are not marked for softness.

3 See footnote 1.
2.4 Trills

2.4.1 Alveolar

/r/ /r'/

Tally: 2

2.6 Lateral Approximant

/l/ /l'/

Tally: 2

2.7 Affricates

2.7.1 Alveolar

/c/

2.7.2 Palatoalveolar

/rcll/

NB

The letter ŭ represents the combination ťɛ', where palatalised /ɛ'/ softens preceding /š/ (Jones & Ward, 1969:139). ť/ therefore does not need to be marked soft in such a combination. It would therefore be written ťɛ'. Following Alan Timberlake (personal

---

4 The palatal glide /j/ causes softening of a preceding consonant. This does not have to be marked, as it is automatic.

5 The alveolar affricate /c/ can be either hard or soft, but this is not a phonological consideration. It is now usually hard and our set-up would give it the default value [-sharped]. It is therefore not marked for hardness or softness.
communication), we would have a further rule which eliminates the closure to give the combination [ʃʃ].

We do not recognise the 'old Moscow pronunciation' with its possibility of a /ʃ/ phoneme. According to Jones and Ward (1969:142) the modern pronunciation of the letter combinations ɔx and ɔx within a root is ɔz ɔ anyway. If we wanted to account for such combinations with the pronunciation [z'z'], we would have to say that /z/ is palatalised when occurring next to another /z/.

---

6 The palatoalveolar affricate tʃ is soft. Although it is always soft, it is marked as such for ease of exposition, and because it would be marked as such underlyingly.
APPENDIX II

Nominal Inflectional Classes

The tables in this appendix contain forms given in accordance with the phonological transcription outlined in appendix I. For the sake of clarity certain alternations dependent on morphonological information have not been included. For example, the interdependency of stress and stem hardness which determines the correct form of the plural genitive of soft stem nouns belonging to class II and IV, modelled by Brown and Hippisley (1994), is not included in the tables. The examples in table 1 are all of inanimate nouns. It should be noted that class I nouns which are animate will have a singular accusative the same as the singular genitive. Any animate noun of whichever class will have plural accusative syncretic with plural genitive. The nouns in table 1 are given with the stress pattern for the particular lexeme used to exemplify the class. The stress pattern need not be the one associated with the majority of nouns in that class.

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>stól 'table'</td>
<td>ruká 'hand'</td>
<td>kóst' 'bone'</td>
<td>oknó 'window'</td>
</tr>
<tr>
<td>SG</td>
<td>nom stól</td>
<td>ruk-á</td>
<td>kóst'</td>
<td>okn-ó</td>
</tr>
<tr>
<td></td>
<td>acc stól</td>
<td>ruk-u</td>
<td>kóst'</td>
<td>okn-ó</td>
</tr>
<tr>
<td></td>
<td>gen stol-á</td>
<td>ruk-í</td>
<td>kóst'-'i</td>
<td>okn-á</td>
</tr>
<tr>
<td></td>
<td>dat stol-ú</td>
<td>ruk-é</td>
<td>kóst'-'i</td>
<td>okn-ú</td>
</tr>
<tr>
<td></td>
<td>inst stol-óm</td>
<td>ruk-ój</td>
<td>kóst'-'ju</td>
<td>okn-óm</td>
</tr>
<tr>
<td></td>
<td>prep stol-é</td>
<td>ruk-é</td>
<td>kóst'-'i</td>
<td>okn-é</td>
</tr>
<tr>
<td>PL</td>
<td>nom stol-í</td>
<td>rük-i</td>
<td>kóst'-'i</td>
<td>ókn-a</td>
</tr>
<tr>
<td></td>
<td>acc stol-i</td>
<td>rük-i</td>
<td>kóst'-'i</td>
<td>ókn-a</td>
</tr>
<tr>
<td></td>
<td>gen stol-óv</td>
<td>rük</td>
<td>kóst'-'éj</td>
<td>ókon</td>
</tr>
<tr>
<td></td>
<td>dat stol-á-m</td>
<td>rük-á-m</td>
<td>kóst'-'á-m</td>
<td>ókn-a-m</td>
</tr>
<tr>
<td></td>
<td>inst stol-á-m'í</td>
<td>rük-á-m'í</td>
<td>kóst'-'á-m'í</td>
<td>ókn-a-m'í</td>
</tr>
<tr>
<td></td>
<td>prep stol-á-x</td>
<td>rük-á-x</td>
<td>kóst'-'á-x</td>
<td>ókn-a-x</td>
</tr>
</tbody>
</table>

Table 1: The major noun inflectional classes
<table>
<thead>
<tr>
<th></th>
<th>ja/mi 'I/we'</th>
<th>ti/vi 'you/you'</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SG</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>nom</td>
<td>ja</td>
<td>ti</td>
</tr>
<tr>
<td>acc</td>
<td>men'-á</td>
<td>teb'-á</td>
</tr>
<tr>
<td>gen</td>
<td>men'-á</td>
<td>teb'-á</td>
</tr>
<tr>
<td>dat</td>
<td>mn'-e</td>
<td>teb'-é</td>
</tr>
<tr>
<td>inst</td>
<td>mn-ój(u)</td>
<td>tob-ój(u)</td>
</tr>
<tr>
<td>prep</td>
<td>mn-é</td>
<td>teb'-é</td>
</tr>
<tr>
<td><strong>PL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>nom</td>
<td>m-í</td>
<td>v-í</td>
</tr>
<tr>
<td>acc</td>
<td>n-á-s</td>
<td>v-á-s</td>
</tr>
<tr>
<td>gen</td>
<td>n-á-s</td>
<td>v-á-s</td>
</tr>
<tr>
<td>dat</td>
<td>n-á-m</td>
<td>v-á-m</td>
</tr>
<tr>
<td>inst</td>
<td>n-á-m'í</td>
<td>v-á-m'í</td>
</tr>
<tr>
<td>prep</td>
<td>n-á-s</td>
<td>v-á-s</td>
</tr>
</tbody>
</table>

**Table 2:** First and Second person pronouns

<table>
<thead>
<tr>
<th></th>
<th>on/ono/ona 'he/it/she'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>masculine</td>
</tr>
<tr>
<td><strong>SG</strong></td>
<td></td>
</tr>
<tr>
<td>nom</td>
<td>on-o</td>
</tr>
<tr>
<td>acc</td>
<td>j-ovo</td>
</tr>
<tr>
<td>gen</td>
<td>j-ovó</td>
</tr>
<tr>
<td>dat</td>
<td>j-omú</td>
</tr>
<tr>
<td>inst</td>
<td>j-im</td>
</tr>
<tr>
<td>prep</td>
<td>(n')j-om</td>
</tr>
<tr>
<td><strong>PL</strong></td>
<td></td>
</tr>
<tr>
<td>nom</td>
<td>on-í</td>
</tr>
<tr>
<td>acc</td>
<td>j-í-x</td>
</tr>
<tr>
<td>gen</td>
<td>j-í-m</td>
</tr>
<tr>
<td>dat</td>
<td>j-í-m'í</td>
</tr>
<tr>
<td>inst</td>
<td></td>
</tr>
<tr>
<td>prep</td>
<td></td>
</tr>
</tbody>
</table>

**Table 3:** The third person pronoun ON
<table>
<thead>
<tr>
<th></th>
<th>II 'possessive'</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>sg</td>
<td>masculine</td>
<td>neuter</td>
<td>feminine</td>
<td></td>
</tr>
<tr>
<td>nom</td>
<td>mam'in</td>
<td>mam'in-o</td>
<td>mam'in-a</td>
<td></td>
</tr>
<tr>
<td>acc</td>
<td>inanim = sg nom</td>
<td>inanim = sg gen</td>
<td>inanim = sg gen</td>
<td></td>
</tr>
<tr>
<td>gen</td>
<td>mam'in-ovo</td>
<td>mam'in-o</td>
<td>mam'in-o</td>
<td></td>
</tr>
<tr>
<td>dat</td>
<td>mam'in-omu</td>
<td>mam'in-im</td>
<td>mam'in-im</td>
<td></td>
</tr>
<tr>
<td>inst</td>
<td>mam'in-im</td>
<td>mam'in-om</td>
<td>mam'in-om</td>
<td></td>
</tr>
<tr>
<td>prep</td>
<td>mam'in-i</td>
<td>mam'in-oj</td>
<td>mam'in-oj</td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Class I 'long-form' adjectives

<table>
<thead>
<tr>
<th></th>
<th>II 'possessive'</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>sg</td>
<td>masculine</td>
<td>neuter</td>
<td>feminine</td>
<td></td>
</tr>
<tr>
<td>nom</td>
<td>mam'in</td>
<td>mam'in-o</td>
<td>mam'in-u</td>
<td></td>
</tr>
<tr>
<td>acc</td>
<td>inanim = sg nom</td>
<td>inanim = sg gen</td>
<td>inanim = sg gen</td>
<td></td>
</tr>
<tr>
<td>gen</td>
<td>mam'in-ovo</td>
<td>mam'in-o</td>
<td>mam'in-o</td>
<td></td>
</tr>
<tr>
<td>dat</td>
<td>mam'in-omu</td>
<td>mam'in-im</td>
<td>mam'in-im</td>
<td></td>
</tr>
<tr>
<td>inst</td>
<td>mam'in-im</td>
<td>mam'in-om</td>
<td>mam'in-om</td>
<td></td>
</tr>
<tr>
<td>prep</td>
<td>mam'in-i</td>
<td>mam'in-oj</td>
<td>mam'in-oj</td>
<td></td>
</tr>
</tbody>
</table>

Table 5: Class II 'possessive' adjectives
<table>
<thead>
<tr>
<th>SG nom</th>
<th>SG acc</th>
<th>GEN</th>
<th>DAT</th>
<th>INST</th>
<th>PREP</th>
</tr>
</thead>
<tbody>
<tr>
<td>masc</td>
<td>otcov</td>
<td>otcov-a</td>
<td>otcov-u</td>
<td>otcov-im</td>
<td>otcov-om</td>
</tr>
<tr>
<td>neuter</td>
<td>otcov-o</td>
<td>otcov-a</td>
<td>otcov-o(0)</td>
<td>otcov-a</td>
<td>otcov-u</td>
</tr>
<tr>
<td>feminine</td>
<td>otcov-u</td>
<td>otcov-oj</td>
<td>otcov-oj(u)</td>
<td>otcov-oj</td>
<td>otcov-oj</td>
</tr>
</tbody>
</table>

Table 6: Class III 'possessive' adjectives
APPENDIX III

This appendix contains a simplified outline of the morphological hierarchy in theory A from chapter five written in DATR. The real DATR fragment is in Appendix IV and is more complex, including, among other things, stress information and the lexemic hierarchy.

% The node MOR_NOMINAL [Sections 5.3, 5.4 and 5.5]
MOR_NOMINAL:
<mor> == "<stem>"
<mor sg acc> == EVALUATION
<mor pl acc> == EVALUATION
<mor sg gen> == "<stem>" _a
<mor sg dat> == "<stem>" _u
<mor pl nom> == "<stem>" _i
<mor pl gen> == "<mor pl prep>"
<mor pl dat> == "<stem>" "<mor theme_vowel>" _m
<mor pl inst> == "<stem>" "<mor theme_vowel>" _m'i
<mor pl prep> == "<stem>" "<mor theme_vowel>" _x.

% The node MOR_NOUN: [Sections 5.5 and 5.7]
MOR_NOUN:
<> == MOR_NOMINAL
<mor pl gen> == EVALUATION
<mor sg prep> == "<stem>" _e
<mor sg inst> == "<stem>" _om
<mor theme_vowel> == _a.

N_I:
<> == MOR_NOUN
<mor formal gender> == masc
<mor hard pl gen> == "<stem>" _ov.

N_IV:
<> == MOR_NOUN
<mor formal gender> == neut
<mor sg nom> == "<stem>" _o
<mor pl nom> == "<stem>" _a
<mor pl gen> == EVALUATION.

% The node N_AI: [section 5.7]
N_AI:
<> == MOR_NOUN
<mor sg gen> == "<stem>" _i
<mor sg dat> == "<mor sg prep>"
<mor formal gender> == fem.

% The node N_II: [sections 5.7 and 5.8]
N_II:
<> == N_AI
<mor sg nom> == "<stem>" _a
<mor sg acc> == "<stem>" _u
<mor sg inst> == "<stem>" _oj (u)
<mor pl gen> == EVALUATION.
% The node N_III: [section 5.7]
N_III:
 <> == N_AI
  <mor stem hardness> == soft
  <mor sg prep> == "<mor sg gen>"
  <mor sg inst> == "<stem>_ju."

% The node MOR_ADJ: [sections 5.6 and 5.8]
MOR_ADJ:
 <> == MOR_NOMINAL
  <mor sg gen fem> == "<mor sg prep fem>"
  <mor sg dat fem> == N_AI
  <mor sg inst fem> == N_II
  <mor sg inst> == "<stem>_im
  <mor sg prep> == "<stem>_om
  <mor sg prep fem> == _oj
  <mor theme_vowel> == _i.

% The node A_L: [section 5.6]
A_L:
 <> == MOR_ADJ
  <mor sg gen masc> == "<stem>_ovo
  <mor sg gen neut> "<mor sg gen masc>"
  <mor sg dat masc> == "<stem>_omu
  <mor sg dat neut> == "<mor sg dat masc>".

% The node A_I: [section 5.6]
A_I:
 <> == A_L
  <mor sg nom masc> == "<stem>_ij
  <mor sg nom fem> == N_II _ja
  <mor sg nom neut> == N_IV _je
  <mor pl nom> == "<stem>_ije.

% The node A_II: [section 5.6]
A_II:
 <> == A_L
  <mor sg nom fem> == N_II
  <mor sg nom neut> == N_IV
  <mor sg acc fem> == N_II.

% The node A_III: [section 5.6]
A_III:
 <> == MOR_ADJ
  <mor sg nom fem> == N_II
  <mor sg nom neut> == N_IV
  <mor sg acc fem> == N_II.
APPENDIX IV

This fragment represents theory A (chapter five) of Russian nominal inflection, embedded within the Network Morphology framework.

Theory A rejects an intermediate N_O class of 'o-stems' and claims that the oblique morphology of N_I and N_IV arises from higher nominal morphology (in the case of the singular genitive and singular dative) and noun morphology (in the case of the singular instrumental). Another important hallmark is that it contains a node N_AI which generalises information for classes N_II and N_III. The problem with theory A is that it gives the marginal adjectival class A_III a higher status within adjectival inflection. This is why the singular genitive and singular dative endings found in N_I and N_IV are treated as nominal defaults.

The fragment has been checked on the first 1500 noun lexemes from Zasorina (1977), a sample of adjectives from the three classes in chapter five and the first, second and third person pronouns.

LOAD DECLARATIONS

The file requires the loading of one of the noun lexicons and the noun show declarations, or the adjective lexicon (rusalex6.dtr) and adjective show declarations, or the pronoun lexicon (rusplex6.dtr) and pronoun show declarations. Here we see that the noun lexicon v-z6.dtr and noun show declarations are to be loaded, as they are not quoted out.

# load 'v-z6.dtr'.
## load 'rusplex6.dtr'.
# load 'rusn6.dec'.
## load 'rusp6.dec'.
## load 'rusalex6.dtr'.
## load 'rusa6.dec'.
The node NOMINAL

Statements about lexemes default to the empty sequence. The stem is the same as all of the 'inflectional root'. The default phonological hardness of a stem is 'hard'. Nouns bear the index 1 for stress assignment, which means for all nominals that they will be assigned the default stress, no stress on the ending. To determine morphology of nominals evaluate the final element of the root and go to the node PARADIGM. The final element of the root is by default a consonant.

NOMINAL:

<> ==
<stem> == "<infl_root all>"
<phon stem hardness> == hard
<index> == 1
<mor> == PARADIGM:"<infl_root final>"
<stress> == <mor "><index>"
<infl_root final> == consonant.

The node ADJ

ADJ inherits from nominal and assigns class A_I as the default inflectional class for adjectives.

ADJ:

<> == NOMINAL
<syn cat> == adj
<declensional_class> == A_I:<mor>.

The node NOUN

NOUN inherits from NOMINAL. It assigns declensional class by evaluating the semantics of (biological) sex. Gender is also assigned by evaluating sex. Syntactic animacy is determined according to the semantics. By default (syntactic) person is third and semantic objects are undifferentiated for sex.

NOUN:

<> == NOMINAL
<declensional_class> == DECLENSION:"<sem sex>"
<syn cat> == n
<syn gender> == GENDER:"<sem sex>"
<syn animacy> == "<sem animacy>"
<sem animacy> == ANIMACY:"<sem sex>"
<syn person> == third
<sem sex> == undifferentiated.

The node PRONOUN

The default syntactic animacy of pronouns is animate, because pronouns have genitive-accusative syncretism. The morphology of the singular accusative involves evaluation of gender and animacy. The morphological case of feminine animates is the same as the morphological case of masculine animates, and the morphological case of neuter animates is the same as the morphological case of masculine animates. This is because the third person pronouns have genitive-accusative syncretism for feminine and neuter pronouns in the singular.

PRONOUN:

<> == NOUN
<syn animacy> == animate
<mor sg acc> == ACCUSATIVE:<sg "<syn gender>" "<syn animacy>" >
<mor case fem animate> == "<mor case masc animate>"
<mor case neut animate> == "<mor case masc animate>"
<sem sex contextl> == male
We may query pronouns for three 'context' types: the first context where we know that the referent of the pronoun is male; the second context where we know that the referent of the pronoun is female. The derivable theorems for these two contexts tell us that the syntactic gender is masculine and feminine respectively. The third context is the one where the semantics cannot help us to determine the gender of the pronoun. Instead, the gender is determined by the gender of the antecedent (masc, fem, or neut).

SOME INTERDEPENDENCIES

The node ACCUSATIVE
The singular (accusative) will take the form of the appropriate morphological case: if masc animate, then genitive; if fem or neut, then the default nominative. The plural (accusative) will take the form of the appropriate morphological case: if animate, then genitive; if inanimate, then the default nominative. See the MOR_NOMINAL node for statements about morphological case.

ACCUSATIVE:
<sg> == "<mor sg "<mor case"> "
<pl> == "<mor pl "<mor case"> ".

The node ADJ-VOWEL
If unstressed the vowel in question is /i/. If stressed the vowel in question is /o/. This is used for the vowel alternation in the singular nominative masculine of A_I adjectives (e.g. krutój 'steep / hard' -vs- novij 'new').

ADJ-VOWEL:
<> == \^i
<\> == \^o.

The node ADJ-OR-NOUN (see over)
In contrast with Fraser and Corbett (1995) this theory does not have a separate declensional class for indeclinable nouns (class V). At NOMINAL we saw that the final element of the root is evaluated to determine morphology. At PARADIGM (see later) we see that if the final element is a vowel, we should go to ADJ_OR_NOUN. The first line at ADJ_OR_NOUN says that, in the absence of any information about animacy, one should go to MOR_WORD (where morphology defaults to the bare stem). Note that this means that there is a route from NOMINAL to PARADIGM to ADJ_OR_NOUN to MOR_WORD for any item that ends in a vowel as final element of the root/stem, and which does not specify any value for animacy. Such an item is an indeclinable adjective. On the other hand, any item of which the root/stem ends in a vowel, but which specifies a value for animacy is an indeclinable noun. The paths <animate 1> and <inanimate 1> state the value for (ending) stress as being the default pattern found at STRESS (no stress).
Finally, the generalisations about the formal gender of indeclinable nouns stated by Fraser and Corbett (1995) at the node N_V are stated here. Animate indeclinables are masculine, and inanimate indeclinables are neuter.
The node ANIMACY
Semantic animacy at the node NOUN requires evaluation of biological sex. There are three values for sex: male, female, and undifferentiated. Male and female will match with the empty path to yield 'animate' as the value for animacy. Items undifferentiated for sex will be 'inanimate'.

ANIMACY:
<> == animate
<undifferentiated> == inanimate.

The node DECLENSION
If the noun in question denotes a male, it should belong in class I. If it denotes a female, it should belong in class II.

DECLENSION:
<male> == N_I:<mor>
<female> == N_II:<mor>.

The node GENDER
If the noun denotes a male, then the gender is masculine. If the noun denotes a female, then the gender is feminine. If the noun is undifferentiated for sex, then the gender will be assigned according to the declensional class.

GENDER:
<male> == masc
<female> == fem
<undifferentiated> == "<mor formal gender>".

The node GEN_PL
Referred to by class IV (the node N_IV). The default for N_IV is to have the same plural genitive as N_II. However, if the final element of the stem is /j/, then N_IV will have the same plural genitive as N_I. This captures one of the switches dealt with in Brown and Hippisley (1994), but in a slightly more elegant way.

GEN_PL:
<> == N_II:<mor pl gen>
<\j> == N_I:<mor hard pl gen>.

The node MGP
This is referred to by MOR_NOUN, which requires an evaluation of stem hardness. The first line says that a noun should look at what its own morphology (declension) says, if it is not soft. This covers class I, where there is a statement about <mor hard pl gen>. Finally, if the noun stem is soft, then the ending is -ej. Again, this captures the generalisations made in Brown and Hippisley (1994).

MGP:
<> == "<mor>"
<soft> == "<stem pl>" \^ ej "<stress pl>".
The node **NOM-PL**

This is referred to by class I, which evaluates the stress index of the lexical item. If the stress index is not 3 (pattern C stress for class I), then the stem final element in the plural and the stem final element in the singular are evaluated, and the corresponding value defined at NOM-PL2. If the index is 3, then the noun should have -á in the plural nominative (e.g. beregá 'shores').

NOM-PL:

```plaintext
<> == NOMPL2:<"<stem pl final>" <"stem sg final>” >
<3> == N_IV:<mor pl nom>. %stressed -a N_Is
```

The node **NOM-PL2**

The default is to follow the plural nominative as inherited at MOR_NOUN. Note that there is no statement of what the plural nominative is at MOR_NOUN. We could refer to MOR NOMINAL. In chapter five, we did not deal with these alternations in class I, which generally follows the default ending. If the plural stem ends in /j/ then the plural nominative will be -á (e.g. bratja 'brothers'). Finally, a class I noun which ends in any consonant in the plural and -in in the singular will have the ending /e/, such as angl’ič’ane 'Englishmen'.

NOM-PL2:

```plaintext
<> == MOR_NOUN:<mor pl nom>
<\j> == N_IV:<mor pl nom>
<consonant \^in> == "<stem pl>" \^e.
```

The node **PARADIGM**

This is referred to by NOMINAL. If a root/stem ends in a vowel, then determine what its animacy is. (This will help you to decide what its gender is, because it is indeclinable.) If the noun ends in a consonant, then its morphology (see statement at NOMINAL) is given by its declensional case.

PARADIGM:

```plaintext
<vowel> == ADJ_OR_NOUN:< "<sem animacy>” >
<consonant> == "<declensional_class>”.
```

The node **STEMSTRESS**

This is referred to by class N-II. If the noun is not a soft stem noun with ending stress in the plural, then it will consist of the plural genitive stem only and the value for ending stress. If the noun is a soft stem noun with ending stress in the plural, then refer to MGP, which states that the ending of soft stems is -ej, and stressed soft is an extension of soft, so the noun will have the ending -ej.

STEMSTRESS:

```plaintext
<> == "<stem pl gen>" "<stress pl>"
<soft @\"> == MGP.
```

**MORPHOLOGICAL HIERARCHY**

The node **MOR_WORD** (see over)

Morphological words by default consist of the stem and some value for stress. The pattern which goes with index 1 is STRESS, where no stress is defined.
The node MOR_NOMINAL [Sections 5.3, 5.4 and 5.5]

* MOR_NOMINAL inherits from MOR_WORD.

* Note that under this theory (theory A) the node MOR_NOMINAL specifies defaults for <mor sg gen> and <mor sg dat>.

* Extensions of <mor case>

  The extensions of the path <mor case> tell us what the morphological case of animates and inanimates is. If something is masculine animate then it behaves as animate masculine. This is because the order of features evaluated for the singular accusative differs from the order for the plural accusative (a reason to differentiate the two). The default morphological case is nominative. The morphological case for animates is genitive. Morphological case allows for mismatches between actual case (accusative) and the form that realizes it (nominative or genitive), similar to items which have a different syntactic gender from the one they would be assigned formally. If an item is phonologically hard, then it is morphologically hard.

* The second choice of stress for nominals <mor 2> is stress pattern B.

* The singular accusative requires an evaluation of gender and animacy. As there is no extension of <mor case> involving fem or neut, the case form for these, irrespective of animacy, is nominative. The plural accusative evaluates animacy only.

* The other paths state what is in chapter five, with the addition of information about stress and whether the stem is a plural stem.

* The path <mor vowel sg> is used in the singular instrumental of class II and in the adjective classes, so that it is possible to deal with the pronouns such as ona, which have a different vowel from the adjective and noun in the instrumental singular, but otherwise the same ending (e.g. j-e-ju -vs- nov-o-ju). The same is also done with other adjectival endings (e.g. nov-o-j singular genitive, singular dative and singular prepositional -vs- n-e-j, which encodes the same number and case distinctions).

MOR_NOMINAL:
<> == MOR_WORD
<mor case masc animate> == "<mor case animate masc>"
<mor case> == nom
<mor case animate> == gen
<mor stem hardness> == "<phon stem hardness>"
<mor 2> == STRESS_B:<stress>
<mor sg acc> ==
  ACCUSATIVE:< sg "<syn gender>" "<syn animacy>" >
<mor pl acc> ==
  ACCUSATIVE:< pl "<syn animacy>" >
<mor sg gen> == "<stem sg gen>" \ a "<stress sg>"
<mor sg dat> == "<stem sg>" \ u "<stress sg>"
<mor pl nom> == "<stem pl nom>" \ i "<stress pl nom>"
<mor pl gen> == "<mor pl prep>"
<mor pl dat> == "<stem pl>" "<mor theme_vowel>" "<stress pl>" \ m
<mor pl inst> ==
  "<stem pl>" "<mor theme_vowel>" "<stress pl>" \ m\i
<mor pl prep> == "<stem pl>" "<mor theme_vowel>" "<stress pl>" \ x
<mor vowel sg> == \ o.
% The node MOR_NOUN [Sections 5.5 and 5.7]
% This is as outlined in chapter five. For the plural genitive the evaluation
% is of the hardness of the noun stem. Noun defaults for singular
% prepositional and singular instrumental are -e and -om respectively.
% The theme vowel for nouns is -a.

MOR_NOUN:
  =>  == MOR_NOMINAL
      <mor pl gen>  == MGP: "<mor stem hardness>" pl gen
      <mor sg prep> == "<stem sg>" ^ e "<stress sg>"
      <mor sg inst> == "<stem sg>" ^ om "<stress sg>"
      <mor theme_vowel> == \^ a.

% The node N_I
% This inherits from MOR_NOUN. The third, fourth, fifth and sixth choices
% of stress pattern are C, Ci, D and Bi respectively (see later for
% explanation of stress patterns). The formal gender assigned, if there
% is no assignment by semantics, is masculine. The plural nominative
% is stated here, unlike the discussion in chapter five. Class N_I
% follows the nominal default, but there are subclasses which require
% evaluation (see explanation of nodes PL_NOM and PL_NOM2 earlier). Hard
% plural genitive is stem plus -ov.

N_I:
  =>  == MOR_NOUN
      <mor 3>  == STRESS_C: <stress>
      <mor 4>  == STRESS_Ci: <stress>
      <mor 5>  == STRESS_D: <stress>
      <mor 6>  == STRESS_Bi: <stress>
      <mor formal gender> == masc
      <mor sg nom> == NOM_PL: "<index>" \\ o "<stress sg>" "<stress pronoun>"
      <mor pl nom> == "<stem pl>" \^ a "<stress pl nom>"

% The node N_IV
% Stress patterns D, C, Bi and Ci are the third, fourth, fifth and sixth
% choices. The formal gender of this class is neuter. The singular
% nominative is -o. Note the reference to <stress pronoun> on the
% right-hand side. This is because class A_II refers to N_IV for the
% realisation of singular nominative neuter and the lexeme ON 'he/she/it'
% belongs to class A_II, except that we must specify a special pronoun
% stress, because of jevO, for example. We must also do this here.
% The plural nominative is -a. The plural genitive involves evaluation
% of the final element of the stem (see explanation of GEN_PL).

N_IV:
  =>  == MOR_NOUN
      <mor 3>  == STRESS_D: <stress>
      <mor 4>  == STRESS_C: <stress>
      <mor 5>  == STRESS_Bi: <stress>
      <mor 6>  == STRESS_Ci: <stress>
      <mor formal gender> == neut
      <mor sg nom> == "<stem sg nom>" \ o "<stress sg>" "<stress pronoun>"
      <mor pl nom> == "<stem pl>" \^ a "<stress pl nom>"
      <mor pl gen> == GEN_PL: "<stem pl final>".

% The node N_AI [section 5.7] (see over)
% This is one of the distinguishing characteristics of this theory. Here
% the singular genitive, referral of singular dative to singular prepositional
% and formal gender are generalized over classes N_II and N_III.
N_AI:

<> == MOR_NOUN
<mor sg gen> == "<stem sg>" \^ i "<stress sg>"
<mor sg dat> == "<mor sg prep>
<mor formal gender> == fem.

% The node N_II  [sections 5.7 and 5.8]
% This inherits from N_AI. The third, fourth, fifth, sixth and seventh
% stress patterns are D (via N_IV), Bi, Bii, Di and Ci respectively.
% The singular nominative includes reference to pronoun stress in order to deal
% with the stress of ona. The stress of the singular accusative may
% differ from the rest of the singular stress paradigm (e.g. patterns
% Bii and Di). The plural genitive requires evaluation of stem
% hardness and plural stress (see explanation of STEMSTRESS).

N_II:

<> == N_AI
<mor 3> == N_IV
<mor 4> == STRESS_Bi:<stress>
<mor 5> == STRESS_Bii:<stress>
<mor 6> == STRESS_Di:<stress>
<mor 7> == STRESS_Ci:<stress>
<mor sg nom> == "<stem sg nom>" \^ a "<stress sg>" "<stress pronoun>"
<mor sg acc> == "<stem sg>" \^ u "<stress sg acc>"
<mor sg inst> ==
"<stem sg inst>" "<mor vowel sg>" "<stress sg>" \^ j '(' u ')'
<mor pl gen> == STEMSTRESS:"<mor stem hardness>" "<stress pl>".

% The node N_III  [section 5.7]
% This inherits from N_AI. The second stress pattern is Ci, and the third
% choice pattern B. All members of this class are morphologically soft.
% The singular prepositional is referred to the singular genitive. Note
% that we do not need to put a stress path next to the -ju ending of
% the singular instrumental, as -ju is never stressed.

N_III:

<> == N_AI
<mor 2> == STRESS_Ci:<stress>
<mor 3> == STRESS_B:<stress>
<mor stem hardness> == soft
<mor sg prep> == "<mor sg gen>"
<mor sg inst> == "<stem sg inst>" \^ ju.

% MORPHOLOGICAL HIERARCHY: ADJECTIVE INFLECTION

% The node MOR_ADJ  [sections 5.6 and 5.8]  (see over)
% This inherits from MOR_NOMINAL. The singular genitive feminine refers to
% the singular prepositional feminine (the opposite asymmetry from
% class N_III). The singular dative feminine is obtained by reference to the
% node N_AI (see earlier), where it is stated that the singular dative is the
% same as the singular prepositional. As the singular dative feminine is an
% extension of the singular dative, so the singular prepositional will be
% extended by the fem feature, which means that we refer back to the singular
% prepositional feminine for the realisation of the singular dative feminine.
% The singular instrumental feminine refers to N_II. The singular
% instrumental (masculine and neuter), singular prepositional (masculine
and neuter) and singular prepositional feminine are all direct realisations.
The theme vowel -i- occurs in the oblique cases of the plural.

MOR_ADJ:
< > == MOR NOMINAL
< mor sg gen fem> == "< mor sg prep fem>"
< mor sg dat fem> == N AI
< mor sg inst fem> == N II
< mor sg inst> == "< stem> " i "< stress sg>" " < stress pronoun>
< mor sg prep> == "< stem> " "< mor vowel sg prep> "< stress sg>" " < stress pronoun>
< mor sg prep fem> == "< stem> " "< mor vowel sg> "< stress sg>" " < stress pronoun"
< mor theme vowel> == " < i.

% The node A L  [section 5.6]
The singular genitive masculine is -ovo, with an option for -ovó stress, if
a third person pronoun is being used. The singular genitive neuter is the
same as the singular genitive masculine. The singular dative masculine is
-omu, with an option for -omú, if a third person pronoun is being used.
The singular dative neuter is the same as the singular dative masculine.
Note that we are forced to state the syncretism as a referral, because of
the existence of paths extended by gender features at the node MOR_ADJ.
Stripping away the referrals would lead to the adoption of the nominal
defaults -a and -u. This goes against the historical trend.

A L:
< > == MOR ADJ
< mor sg gen masc> == "< stem> " "< mor vowel sg> "< stress sg>" "< stress pronoun>
< mor sg gen neut> == "< mor sg gen masc>"
< mor sg dat masc> == "< stem> " "< mor vowel sg> "< stress sg>" "< stress pronoun>
< mor sg dat neut> == "< mor sg dat masc>".

% The node A I  [section 5.6]
This inherits from the node A L. It accounts for the majority of
attributive adjectives. The singular nominative masculine combines
the singular stem with -ij or -ôj, depending on the stress of the
adjective (see ADJ VOWEL earlier). The singular nominative feminine
refers to N II and combines this with the augment -ja. The singular neuter
refers to the node N IV and combines the value with the augment -je.
The plural nominative combines the plural theme vowel with -je. Finally,
the singular accusative feminine combines the value for singular
accusative at N II with the augment -ju.

A I:
< > == A L
< mor sg nom masc> == "< stem sg>" ADJ VOWEL:"< stress sg>" "< stress sg>" "< stress pronoun>
< mor sg nom fem> == N II " ja
< mor sg nom neut> == N IV " je
< mor pl nom> == "< stem pl> " < mor theme vowel> "< stress pl>" "< stress pronoun"
< mor sg acc fem> == N II " ju.

% The node A II  [section 5.6]  (see over)
This inherits from A L. It states that the singular nominative feminine
is inherited from N II, the singular nominative neuter from N IV,
and the singular accusative feminine from N II.
A_II:
    <> == A_L
    <mor sg nom fem> == N_II
    <mor sg nom neut> == N_IV
    <mor sg acc fem> == N_II.

% The node A_III [section 5.6]
% This inherits from MOR_ADJ. It states that it inherits its
% singular nominative feminine from N_II, its singular nominative
% neuter from N_IV, and its singular accusative feminine from N_II.

A_III:
    <> == MOR_ADJ
    <mor sg nom fem> == N_II
    <mor sg nom neut> == N_IV
    <mor sg acc fem> == N_II.

% STRESS HIERARCHY
% THE STRESS HIERARCHY (see over)
% Brown, Corbett, Fraser, Hippisley and Timberlake (1996) demonstrate
% how stress information can be incorporated into the network without
% positing extra desinences. Lexical entries give an index value
% which states the rank of the choice of stress pattern offered to them
% by membership of a specific inflectional class. If the index value
% is one, then this is inherited by default from the node NOMINAL (see
% earlier). This theory differs from that of Brown et al (1996) in that
% the node STRESS contains only one fact which states that the default
% is nothing. The node STRESS_B states that the plural is the same as
% the singular, and that the singular is stressed (on the ending).
% The stress patterns are:
% Pattern A (from the node STRESS)
%   stress on stem in the singular; stress on stem in plural
% Pattern B (from the node STRESS_B)
%   stress on ending in the singular; stress on ending in the plural
% Pattern C (from the node STRESS_C)
%   stress on stem in the singular; stress on ending in the plural
% Pattern D (from the node STRESS_D)
%   stress on ending in the singular; stress on stem in the plural
% Pattern Bi (from the node STRESS_Bi)
%   same as pattern B, except that stress is on stem in the plural nominative
% Pattern Bii (from the node STRESS_Bii)
%   same as pattern Bi, except that stress is on stem in the singular accusative
% Pattern Ci (from the node STRESS_Ci)
%   same as pattern C, except that stress is on stem in the plural nominative
% Pattern Di (from the node STRESS_Di)
%   same as pattern D, except that stress is on stem in the singular accusative
We have argued in chapters two and four that the ordering of features can account for loss of gender distinction in the plural and the fact that there are more cases in the singular than the plural. Note that we do not require nodes to block individual cases. The ordering of features also means that we can state in one fact about `<mor sg>` that it is undefined. If case were ordered before number, then we would have to state for each case that singular was undefined, thereby making it appear accidental that singular was undefined in nominative, undefined in accusative and so on. Note that there is no PLURALIA_III, because, the plural of N_III is indistinguishable from the soft plural of N_I.

```
PLURALIA_I:
<mor> == "<mor pluralia>"
<mor sg> == undefined
<mor pluralia> == N_I:<mor>.

PLURALIA_II:
<> == PLURALIA_I
<mor pluralia> == N_II:<mor>.
```
SINGULARIA TANTUM BLOCKING
% The same argumentation applies for singularia tantum nouns as for
% pluralia tantum. If case were ordered before number here, then we
% would have to list for every case that the plural was undefined.
% Furthermore, in support of our claim in chapter five that
% nouns do not have gender features in their morphological paths
% for realisation, the problem would also arise if we included
% gender features before number features, a problem that would probably
% arise if one wished to account for the fact that number is 'closer'
% to the stem and inherent. The problem would be even greater if
% gender and case were ordered before number, as this would mean
% a multiplication of the paths that would be required to be listed.
% In contrast to this, our statement that <mor pl> is undefined is
% explicit, economic, and makes the point that pluralia tantum and
% singularia tantum are to be expected, whereas genitive tantum, for
% example, is not.

SINGULARIA_I:
<mor> == "<mor singularia>"
<mor pl> == undefined
<mor singularia> == N_I:<mor>.

SINGULARIA_II:
<> == SINGULARIA_I
<mor singularia> == N_II:<mor>.

SINGULARIA_III:
<> == SINGULARIA_I
<mor singularia> == N_III:<mor>.

SINGULARIA_IV:
<> == SINGULARIA_I
<mor singularia> == N_IV:<mor>.

% SUFFIXES
% These nodes do not constitute a hierarchy. They define certain stem
% stem types. One defines plural stems that are augmented by /j/.
% The other defines stems of nouns such as angl’ič’an’in 'Englishman',
% which have their plural stem formed by truncating the -in. Certain
% of these type of nouns have the -in stressed. R_STEM accounts
% for mat’ 'mother' and doč’ 'daughter', which are augmented by
% -er in the singular oblique cases and the plural.

JOT_PL:
<stem pl> == "<infl_root all pl>" \^j %pl for donja
<stem pl final> == \^j.
IN_SG:
<stem pl> == "<infl_root all>"
<stem pl final> == consonant
<stem sg> == "<infl_root all>" @' \^in
<stem sg final> == \^in.

IN_SG_2:
<> == IN_SG
<stem sg> == "<infl_root all>" @' \i\n
<stem sg final> == IN_SG.

RSTEM:
<stem sg nom> == "<infl_root all>"
<stem> == "<infl_root all>" \^er'.

% The node ON_STEM
% This node is actually part of the lexemic hierarchy, because it inherits
% from NOUN, and lexical items inherit from it.
% It accounts for the 13 nouns listed in Zaliznjak (1977: 809) which
% follow the pattern of im’a ‘name’. Note that it lists the declensional
% class as N-IV. Nouns of this type may differ in the oblique vowel
% which goes before the -n in the oblique cases and the plural (e.g. im’on
% ‘of names’, but sem’an ‘of seeds’). Note that the fact which states
% that the morphological singular is inherited from N_III is not an OAP
% violation, because there is no statement at NOUN or higher which involves
% the morphological category of number being extended by the morphological
% category of case.

ON_STEM:
<> == NOUN
<declensional_class> == N_IV:<mor>
<stem sg nom> == "<infl_root all>"
<stem> == "<infl_root all>" \^n
<mor sg nom> == N_II
<mor sg> == N_III
<mor sg inst> == <stem> \^em.

### FLEETING VOWELS

These are the vowels that appear in either the singular nominative of class
N_I nouns, or the plural genitive of class N_II or N_IV nouns. No
theoretical claims are made on the basis of these nodes. Although one could
claim that appearance of the fleeting vowel is a matter of syllabification
and the vowel will be a mid vowel, it is still necessary to say whether it
is the front /e/ or the back /o/. FL_V_1 states that there will be no vowel
unless specifically stated for a particular number and case. For the
singular nominative it specifies /e/. FL_V_2 inherits from FL_V_1 the
generalisation that there will be no vowel unless the number and case are
explicitly stated, but says that the singular nominative vowel is /o/.
FL_V_1_II_IV has the same vowel for the plural genitive as FL_V_1 does for
the singular nominative. FL_V_2_II_IV has the same vowel for the plural
genitive as FL_V_2 has for the singular nominative. FL_V_3_II_IV specifies
a stressed fleeting vowel in the plural genitive, which would not be

-255-
% stressed otherwise (i.e. because the noun belongs to a particular stress
% pattern). FL_V_4_II_IV declares a stressed /ó/ to be inserted in the plural
% genitive. Finally, nouns such as l'ubov' 'love' (sg nom) have a fleeting
% vowel in the singular nominative and singular instrumental.

FL_V_1:
  <> ==
  <sg nom> == \^e.

FL_V_2:
  <> == FL_V_1
  <sg nom> == \^o.

FL_V_1_II_IV:
  <> ==
  <pl gen> == FL_V_1:<sg nom>.

FL_V_2_II_IV:
  <> == FL_V_1_II_IV
  <pl gen> == FL_V_2:<sg nom>.

FL_V_3_II_IV:
  <> == FL_V_1_II_IV
  <pl gen> == FL_V_1_II_IV @".

FL_V_4_II_IV:
  <> == FL_V_1_II_IV
  <pl gen> == @' FL_V_2_II_IV @".

FL_V_2_III:
  <> == FL_V_2
  <sg inst> == FL_V_2:<sg nom> @".

# hide
ACCUSATIVE ADJ ADJ_OR_NOUN ADJ_VOWEL ANIMACY A_I A_II A_III A_L DECLENSION
FL_V_1 FL_V_1_II_IV FL_V_2 FL_V_2_II_IV FL_V_2_III FL_V_3_II_IV FL_V_4_II_IV
FL_V_4_II_IV GENDER GEN_PL MGP MOR_ADJ MOR_NOMINAL MOR_NOUN MOR_WORD
NOMINAL NOM_PL NOM_PL2 NOUN N_I N_II N_III N_IV N_AI ON_STEM PARADIGM
PLURALIA_I PLURALIA_II PLURALIA_IV PRONOUN SINGULARIA_I
SINGULARIA_II SINGULARIA_III SINGULARIA_IV STEMSTRESS STRESS STRESS_B
STRESS_Bi STRESS_Bii STRESS_C STRESS_Ci STRESS_D STRESS_Di.
APPENDIX V

This appendix contains a simplified outline of the morphological hierarchy in theory B from chapter six written in DATR. The real DATR fragment is in Appendix VI and is more complex, including, among other things, stress information and the lexemic hierarchy.

% The node MOR_NOMINAL: [sections 6.2, 6.3 and 6.6]
MOR_NOMINAL:

<mor sg acc> == EVALUATION
<mor pl acc> == EVALUATION
<mor pl nom> == "<stem>" _i
<mor pl gen> == "<mor pl prep>"
<mor pl dat> == "<stem>" _m
<mor pl inst> == "<stem>" _m'i
<mor pl prep> == "<stem>" _x.

% The node MOR_NOUN: [sections 6.3 and 6.5]
MOR_NOUN:

<> == MOR_NOMINAL
<mor sg dat> == "<mor sg prep>"
<mor sg prep> == "<stem>" _e
<mor pl gen> == EVALUATION
<mor theme_vowel> == _a.

% The node N_0: [sections 6.1 and 6.5]
N_0:

<> == MOR_NOUN
<mor sg gen> == "<stem>" _a
<mor sg dat> == "<stem>" _u
<mor sg inst> == "<stem>" _om.

% The node N_I: [section 6.5]
N_I:

<> == N_0
<mor formal gender> == masc
<mor hard pl gen> == "<stem>" _ov.

% The node N_IV: [section 6.5]
N_IV:

<> == N_0
<mor formal gender> == neut
<mor sg nom> == "<stem>" _o
<mor pl nom> == "<stem>" _a
<mor pl gen> == EVALUATION.

% The node N_II: [section 6.5]
N_II:

<> == MOR_NOUN
<mor sg nom> == "<stem>" _a
<mor sg acc> == "<stem>" _u
<mor sg gen> == "<stem>" _i
<mor sg inst> == "<stem>" _oj (u)
<mor pl gen> == EVALUATION
<mor formal gender> == fem.
% The node N_III:  [section 6.5]
N_III:
<> == MOR_NOUN
  <mor stem hardness> == soft
  <mor sg gen> == N_II
  <mor sg prep> == "<mor sg gen>"
  <mor sg inst> == "<stem>"_ju
  <mor formal gender> == fem.

% The node MOR_ADJ:  [section 6.4]
MOR_ADJ:
<> == MOR_NOMINAL
  <mor sg gen> == "<stem>"_ovo
  <mor sg gen fem> == "<mor sg prep fem>"
  <mor sg dat> == "<stem>"_omu
  <mor sg dat fem> == MOR_NOUN
  <mor sg inst> == "<stem>"_im
  <mor sg inst fem> == N_II
  <mor sg prep> == "<stem>"_om
  <mor sg prep fem> == "<stem>"_oj
  <mor theme_vowel> == _i.

% The node A_I:  [section 6.4]
A_I:
<> == MOR_ADJ
  <mor sg nom fem> == N_II_ja
  <mor sg nom neut> == N_IV_je
  <mor sg acc fem> == N_II_ju
  <mor sg nom masc> == "<stem>"_ij
  <mor pl nom> == "<stem>"_ije.

% The node A_II:  [section 6.4]
A_II:
<> == MOR_ADJ
  <mor sg nom fem> == N_II
  <mor sg nom neut> == N_IV
  <mor sg acc fem> == N_II.

% The node A_III:  [section 6.1 and 6.4]
A_III:
<> == MOR_ADJ
  <mor sg nom fem> == N_II
  <mor sg nom neut> == N_IV
  <mor sg acc fem> == N_II
  <mor sg gen neut> == "<mor sg gen masc>"
  <mor sg dat neut> == "<mor sg dat masc>"
  <mor sg gen masc> == N_I
  <mor sg dat masc> == N_I.
This fragment represents theory B (chapter six) of Russian nominal inflection, embedded within the Network Morphology framework.

Theory B posits an intermediate N_O class of 'o-stems' to state the oblique morphology which N_I and N_IV share. This arises from treating the adjectival class A_III as marginal. In chapter six it is argued that this treatment of A_III is supported by the figures which show that there are few examples of this adjectival type and few token occurrences. Under this theory N_II and N_III inherit directly from the MOR_NOUN node.

The fragment has been checked on the first 1500 noun lexemes from Zasorina (1977), a sample of adjectives from the three classes in chapter six and the first, second and third person pronouns.

LEXEMIC HIERARCHY

The node NOMINAL (see over)
Statements about lexemes default to the empty sequence. The stem is the same as all of the 'inflectional root'. The default phonological hardness of a stem is 'hard'. Nouns bear the index 1 for stress assignment, which means for all nominals that they will be assigned...
% the default stress, no stress on the ending. To determine the
% morphology of nominals evaluate the final element of the root and
% go to the node PARADIGM. The final element of the root is by default a
% consonant.

NOMINAL:
<> ==
  <stem> == "<infl_root all>"
  <phon stem hardness> == hard
  <index> == 1
  <mor> == PARADIGM:"<infl_root final>"
  <stress> == <mor "<index>" toute>
  <infl_root final> == consonant.

% The node ADJ
% ADJ inherits from nominal and assigns class A_I as the default
% inflectional class for adjectives.

ADJ:
<> == NOMINAL
  <syn cat> == adj
  <declensional_class> == A_I:<mor>.

% The node NOUN
% NOUN inherits from NOMINAL. It assigns declensional class by
% evaluating the semantics of (biological) sex. Gender is also
% assigned by evaluating sex. Syntactic animacy is determined
% according to the semantics. By default (syntactic) person is third
% and semantic objects are undifferentiated for sex.

NOUN:
<> == NOMINAL
  <declensional_class> == DECLENSION:"<sem sex>"
  <syn cat> == n
  <syn gender> == GENDER:"<sem sex>"
  <syn animacy> == "<sem animacy>"
  <sem animacy> == ANIMACY:"<sem sex>"
  <syn person> == third
  <sem sex> == undifferentiated.

% The node PRONOUN [sections 6.6 and 6.8]
% The default syntactic animacy of pronouns is animate, because
% pronouns have genitive-accusative syncretism. The morphology of
% the singular accusative involves evaluation of gender and animacy.
% The morphological case of feminine animates is the same as the
% morphological case of masculine animates, and the morphological
% case of neuter animates is the same as the morphological case of
% masculine animates. This is because the third person pronouns have
% genitive-accusative syncretism for feminine and neuter pronouns in
% the singular.

PRONOUN:
<> == NOUN
  <syn animacy> == animate
  <mor sg acc> == ACCUSATIVE:<sg "<syn gender>" "<syn animacy>" toute>
  <mor case fem animate> == "<mor case masc animate>"
  <mor case neut animate> == "<mor case masc animate>"
  <sem sex context1> == male
  <sem sex context2> == female
  <syn gender context3 masc> == masc
We may query pronouns for three 'context' types: the first context where we know that the referent of the pronoun is male; the second context where we know that the referent of the pronoun is female. The derivable theorems for these two contexts tell us that the syntactic gender is masculine and feminine respectively. The third context is the one where the semantics cannot help us to determine the gender of the pronoun. Instead, the gender is determined by the gender of the antecedent (masc, fem, or neut).

**SOME INTERDEPENDENCIES**

**The node ACCUSATIVE**  
The singular (accusative) will take the form of the appropriate morphological case: if masc animate, then genitive; if fem or neut, then the default nominative. The plural ( accusative) will take the form of the appropriate morphological case: if animate, then genitive; if inanimate, then the default nominative. See the MORNominal node for statements about morphological case.

ACCUSATIVE:
```plaintext
<sg> == "<mor sg "<mor case"> >"
<pl> == "<mor pl "<mor case"> >".
```

**The node ADJ_VOWEL**
If unstressed the vowel in question is /i/. If stressed the vowel in question is /o/. This is used for the vowel alternation in the singular nominative masculine of A-I adjectives (e.g. krutój 'steep' / 'hard' -vs- novii 'new').

ADJ_VOWEL:
```plaintext
<> == \i
<@\" == \o.
```

**The node ADJ_OR_NOUN** (see over)
In contrast with Fraser and Corbett (1995) this theory does not have a separate declensional class for indeclinable nouns (class V). At NOMINAL we saw that the final element of the root is evaluated to determine morphology. At PARADIGM (see later) we see that if the final element is a vowel, we should go to ADJ_OR_NOUN. The first line at ADJ_OR_NOUN says that, in the absence of any information about animacy, one should go to MOR_WORD (where morphology defaults to the bare stem). Note that this means that there is a route from NOMINAL to PARADIGM to ADJ_OR_NOUN to MOR_WORD for any item that ends in a vowel as final element of the root/stem, and which does not specify any value for animacy. Such an item is an indeclinable adjective. On the other hand, any item of which the root/stem ends in a vowel, but which specifies a value for animacy is an indeclinable noun. The paths <animate 1> and <inanimate 1> state the value for (ending) stress as being the default pattern found at STRESS (no stress). Finally, the generalisations about the formal gender of indeclinable nouns stated by Fraser and Corbett (1995) at the node N_V are stated here. Animate indeclinables are masculine, and inanimate indeclinables are neuter.
ADJ_OR_NOUN:
  >> == MOR_WORD:<mor>
    <animate 1> == STRESS:<stress>
    <inanimate 1> == <animate 1>
    <animate formal gender> == masc
    <inanimate formal gender> == neut.

% The node ANIMACY
% Semantic animacy at the node NOUN requires evaluation of biological
% sex. There are three values for sex: male, female, undifferentiated.
% Male and female will match with the empty path to yield 'animate' as
% the value for animacy. Items undifferentiated for sex will be 'inanimate'.

ANIMACY:
  >> == animate
      <undifferentiated> == inanimate.

% The node DECLENSION
% If the noun in question denotes a male, it should belong in class I.
% If it denotes a female, it should belong in class II.

DECLENSION:
  <male> == N_I:<mor>
  <female> == N_II:<mor>.

% The node GENDER
% If the noun denotes a male, then the gender is masculine. If the
% noun denotes a female, then the gender is feminine. If the noun
% is undifferentiated for sex, then the gender will be assigned according
% to the declensional class.

GENDER:
  <male> == masc
  <female> == fem
  <undifferentiated> == "<mor formal gender>".

% The node GEN_PL
% Referred to by class IV (the node N_IV). The default for N_IV is
% to have the same plural genitive as N_II. However, if the final
% element of the stem is /j/, then N_II will have the same plural genitive
% as N_I. This captures one of the switches dealt with in Brown and
% Hippisley (1994), but in a slightly more elegant way.

GEN_PL:
  >> == N_II:<mor pl gen>
      <\^j> == N_I:<mor hard pl gen>.

% The node MGP
% This is referred to by MOR_NOUN, which requires an evaluation of stem
% hardness. The first line says that a noun should look at what its
% own morphology (declension) says, if it is not soft. This covers
% class I, where there is a statement about <mor hard pl gen>. Finally,
% if the noun stem is soft, then the ending is -ej. Again, this captures
% the generalisations made in Brown and Hippisley (1994).

MGP:
  >> == "<mor>"
      <soft> == "<stem pl>" \^ ej "<stress pl>".
% The node NOM_PL
% This is referred to by class I, which evaluates the stress index of the
% lexical item. If the stress index is not 3 (pattern C stress for class I),
% then the stem final element in the plural and the stem final element in
% the singular are evaluated, and the corresponding value defined at NOM_PL2
% If the index is 3, then the noun should have -á in the plural nominative
% (e.g. beregá 'shores').

NOM_PL:
<> == NOM_PL2:"<stem pl final>" "<stem sg final>" >
<3> == N_IV:<mor pl nom>. %stressed -a N_Is

% The node NOM_PL2
% The default is to follow the plural nominative as inherited at MOR_NOUN.
% Note that there is no statement of what the plural nominative is
% at MOR_NOUN. We could refer to MOR_NOMINAL. In chapter six, we did
% not deal with these alternations in class I, which generally follows
% the default ending. If the plural stem ends in /j/ then the plural
% nominative will be -á (e.g. bratja 'brothers'). Finally, a class I noun
% which ends in any consonant in the plural and -in in the singular
% will have the ending /e/, such as angl`ič`ane 'Englishmen'.

NOM_PL2:
<> == MOR_NOUN:<mor pl nom>
<\j> == N_IV:<mor pl nom>
$consonant \in == "<stem pl>" \e. %angl'ich'ane

% The node PARADIGM
% This is referred to by NOMINAL. If a root/stem ends in a vowel, then
% determine what its animacy is. (This will help you to decide what
% its gender is, because it is indeclinable.) If the noun ends in a
% consonant, then its morphology (see statement at NOMINAL) is
% given by its declensional class.

PARADIGM:
<vowel> == ADJ_OR_NOUN:"<sem animacy>" >
<consonant> == "<declensional_class>".

% The node STEMSTRESS
% This is referred to by class N_II. If the noun is not a soft stem
% noun with ending stress in the plural, then it will consist of
% the plural genitive stem only and the value for ending stress. If
% the noun is a soft stem noun with ending stress in the plural, then
% refer to MGP, which states that the ending of soft stems is -ej,
% and stressed soft is an extension of soft, so the noun will have the
% ending -ej.

STEMSTRESS:
<> == "<stem pl gen>" "<stress pl>"
<soft @\" == MGP.

% DECLENSIONAL CLASS HIERACHY
% The node MOR_WORD
% Morphological words by default consist of the stem and some value
% for stress. The pattern which goes with index 1 is STRESS, where
% no stress is defined.

MOR_WORD:
<mor> == "<stem>" "<stress>"
<mor 1> == STRESS:<stress>.

% The node MOR_NOMINAL [sections 6.2, 6.3 and 6.6]
% MOR_NOMINAL inherits from MOR_WORD.
% This node differs from the equivalent one in theory A in that there are
% no facts about the realisation of the singular genitive and singular
% dative.
% * Extensions of <mor case>
% The extensions of the path <mor case> tell us what the morphological case of
% animates and inanimates is. If something is masculine animate then
% it behaves as animate masculine. This is because the order of features
% evaluated for the singular accusative differs from the order for the plural
% accusative (a reason to differentiate the two). The default morphological
% case is nominative. The morphological case for animates is genitive.
% Morphological case allows for mismatches between actual case (accusative)
% and the form that realizes it (nominative or genitive), similar to items
% which have a different syntactic gender from the one they would be assigned
% formally. If an item is phonologically hard, then it is morphologically
% hard.
% The second choice of stress for nominals <mor 2> is stress pattern B.
% The singular accusative requires an evaluation of gender and animacy.
% As there is no extension of <mor case> involving fem or neut, the
% case form for these, irrespective of animacy, is nominative.
% The plural accusative evaluates animacy only.
% The other paths state what is in chapter six, with the addition
% of information about stress and whether the stem is a plural stem.
% The path <mor vowel sg> is used in the singular instrumental of
% class II and in the adjective classes, so that it is possible
% to deal with the pronouns such as ona, which have a different
% vowel from the adjective and noun in the instrumental
% singular, but otherwise the same ending (e.g. j-e-ju -vs-
% nov-o-ju. The same is also done with other adjectival endings (e.g.
% nov-o-j singular genitive, singular dative and singular prepositional
% -vs- n-e-j, which encodes the same number and case distinctions).

MOR_NOMINAL:
<> == MOR_WORD
<mor case masc animate> == "<mor case animate masc>"
<mor case> == nom
<mor case animate> == gen
<mor stem hardness> == "<phon stem hardness>"
<mor 2> == STRESS_B:<stress>
<mor sg acc> ==
  ACCUSATIVE:< sg "<syn gender>" "<syn animacy>" >
<mor pl acc> == ACCUSATIVE:< pl "<syn animacy>" >
<mor pl nom> == "<stem pl nom>" \^ i "<stress pl nom>"
<mor pl gen> == "<mor pl prep>"
<mor pl dat> == "<stem pl>" <mor theme_vowel> "<stress pl>" \^ m
<mor pl inst> ==
  "<stem pl>" <mor theme_vowel> "<stress pl>" \^ m'i
Unlike theory A we find that this theory (theory B) specifies a noun default for singular dative, which is the referral to singular prepositional. This is as outlined in chapter six. As with theory A, there is still a noun default for the singular prepositional. For the plural genitive, the evaluation is of the hardness of the noun stem. The theme vowel for nouns is -a.

The node N_O [sections 6.1 and 6.5]
This is a defining characteristic of theory B. The node N_O states the realisation of singular genitive and singular dative, which were both nominal defaults in theory A. The singular instrumental, which was a noun default in theory A, is also placed at the node N_O.

The node N_I [section 6.5]
In contrast with theory A, in which it inherits most of its oblique endings from the MOR_NOUN and MOR_NOMINAL node, here N_I inherits from N_O. The third, fourth, fifth and sixth choices of stress pattern are C, Ci, D and Bi respectively (see later for explanation of stress patterns).

The formal gender assigned, if there is no assignment by semantics, is masculine. As with the full DATR representation of theory A, the full representation of theory B here includes a fact about the plural nominative. Class N_I follows the nominal default, but there are subclasses which require evaluation (see explanation of nodes PL_NOM and PL_NOM2 earlier). The hard plural genitive is the stem plus -ov.

The node N_IV [section 6.5] (see over)
As with N_I in this theory (theory B) N_IV inherits from the node N_O its oblique morphology in the singular. Stress patterns D, C, Bi and Ci are the third, fourth, fifth and sixth choices. The formal gender of this class is neuter. The singular nominative is -o. Note the reference to
% <stress pronoun> on the right-hand side. This is because class A_II refers to
% N_IV for the realisation of singular nominative neuter and the lexeme ON
% 'he/she/it' belongs to class A_II, except that we must specify a special
% pronoun stress, because of jevo, for example. We must also do this here.
% The plural nominative is -a. The plural genitive involves evaluation
% of the final element of the stem (see explanation of GEN_PL).

N_IV:
<>
<mor 3> == STRESS_D:<stress>
<mor 4> == STRESS_C:<stress>
<mor 5> == STRESS_Bi:<stress>
<mor 6> == STRESS_Ci:<stress>
<mor formal gender> == neut
<mor sg nom> == "<stem sg nom>" \^ o "<stress sg>" "<stress pronoun>
<mor sg nom> == "<stem sg nom>" \^ a "<stress pl nom>
<mor pl gen> == GEN_PL:"<stem pl final>

% The node N_II [section 6.5]
% In contrast with theory A, N_II inherits directly from MOR_NOUN.
% The third, fourth, fifth, sixth and seventh stress patterns are
% D (via N_IV), Bi, Bii, Di and Ci respectively. The singular
% nominative includes reference to pronoun stress in order to deal
% with the stress of ona. The stress of the singular accusative may
% differ from the rest of the singular stress paradigm (e.g. patterns
% Bii and Di). In contrast with theory A, we find that the singular
% genitive has to be specified at N_II. This is because there would
% be two path identities with N_O at MOR_NOUN, if it were placed there.
% The plural genitive requires evaluation of stem hardness and plural stress
% (see explanation of STEMSTRESS).

N_II:
<>
<mor 3> == MOR_NOUN
<mor 4> == N_IV
<mor 5> == STRESS_Bi:<stress>
<mor 6> == STRESS_Di:<stress>
<mor 7> == STRESS_Ci:<stress>
<mor sg nom> == "<stem sg nom>" \^ a "<stress sg>" "<stress pronoun>
<mor sg acc> == "<stem sg>" \^ u "<stress sg acc>
<mor sg gen> == "<stem sg>" \^ i "<stress sg>
<mor sg inst> ==
"<stem sg inst>" "<stress sg>" \^ j '(' u ')'"<stem sg pl>"} "<stress pl>"
<mor formal gender> == fem.

% The node N_III [section 6.5]
% In theory B this inherits from MOR_NOUN. The second stress pattern is Ci,
% and the third choice pattern B. All members of this class are morphologically
% soft. The singular genitive is inherited orthogonally by a network relation
% from N_II, in contrast with theory A, where it is inherited from N_AI.
% The singular prepositional is referred to the singular genitive. Note
% that we do not need to put a stress path next to the -ju ending of
% the singular instrumental, as -ju is never stressed. The formal gender of
% nouns belonging to N_III is feminine.

N_III:
<>
<mor 2> == STRESS_Ci:<stress>
<mor 3> == STRESS_B:<stress>
<mor stem hardness> == soft
<mor sg gen> == N_II

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ADJECTIVE INFLECTION

The node MOR_ADJ [section 6.4]
This inherits from MOR_NOMINAL. Note that in this theory, theory B, we can put the singular genitive and singular dative defaults for adjectives up at this node: -ovo and -omu. We could not do this in theory A, because there would have been Generalisation Violation identities with the node MOR_NOMINAL.
Other points:
* The singular genitive feminine refers to the singular prepositional feminine (the opposite asymmetry from class N-III).
* The singular dative feminine is obtained by reference to the node MOR_NOUN (unlike N_AI in theory A), where it is stated that the singular dative is the same as the singular prepositional. As the singular dative feminine is an extension of the singular dative, so the singular prepositional will be extended by the fem feature, which means that we refer back to the singular prepositional feminine for the realisation of the singular dative feminine.
* The singular instrumental feminine refers to N_II.
* The singular instrumental (masculine and neuter), singular prepositional (masculine and neuter) and singular prepositional feminine are all direct realisations.
* The theme vowel -i- occurs in the oblique cases of the plural.

MOR_ADJ:
< > == MOR_NOMINAL
<mor sg gen> ==
"<stem>" "<mor vowel sg>" "<stress sg>" \^ vo "<stress pronoun>"
<mor sg gen fem> == "<mor sg prep fem>"
<mor sg dat> ==
"<stem>" "<mor vowel sg>" "<stress sg>" \^ mu "<stress pronoun>"
<mor sg dat fem> == MOR_NOUN
<mor sg inst> == "<stem>" \^ i "<stress sg>" \^ m
<mor sg inst fem> == N_II
<mor sg prep> == "<stem>" "<mor vowel sg prep>" "<stress sg>" \^ m
<mor sg prep fem> == "<stem>" "<mor vowel sg>" "<stress sg>" \^ j
<mor theme_vowel> == \^ i.

The node A_I [section 6.4]
This inherits from the node MOR_ADJ. It accounts for the majority of attributive adjectives. The singular nominative masculine combines the singular stem with -ij or -öj, depending on the stress of the adjective (see ADJ_VOWEL earlier). The singular nominative feminine refers to N_II and combines this with the augment -ja. The singular neuter refers to the node N_IV and combines the value with the augment -je. The plural nominative combines the plural theme vowel with -je. Finally, the singular accusative feminine combines the value for singular accusative at N_II with the augment -ju.

A_I:
< > == MOR_ADJ
<mor sg nom masc> ==
"<stem sg>" ADJ_VOWEL:"<stress sg>" "<stress sg>" \^ j
<mor sg nom fem> == N_II \^ ja
<mor sg nom neut> == N_IV \^ je
The node A_{II} [section 6.4]
This inherits from MOR_ADJ. It states the singular nominative feminine is inherited from N_{II}, the singular nominative neuter from N_{IV}, and the singular accusative feminine from N_{II}.

\[
\text{A_{II}}: \quad \langle > = \text{MOR_ADJ} \\
\text{<mor sg nom fem> = N_{II}} \\
\text{<mor sg nom neut> = N_{IV}} \\
\text{<mor sg acc fem> = N_{II}}.
\]

The node A_{III} [section 6.1 and 6.4]
This inherits from MOR_ADJ. It states that it inherits its singular nominative feminine from N_{II}, its singular nominative neuter from N_{IV}, and its singular accusative feminine from N_{II}.

\[
\text{A_{III}}: \quad \langle > = \text{MOR_ADJ} \\
\text{<mor sg nom fem> = N_{II}} \\
\text{<mor sg nom neut> = N_{IV}} \\
\text{<mor sg acc fem> = N_{II}} \\
\text{<mor sg gen neut> = "<mor sg gen masc>"} \\
\text{<mor sg dat neut> = "<mor sg dat masc>"} \\
\text{<mor sg gen masc> = N_{I}} \\
\text{<mor sg dat masc> = N_{I}}.
\]

STRESS HIERARCHY

THE STRESS HIERARCHY (see over)
Brown, Corbett, Fraser, Hippisley and Timberlake (1996) demonstrate how stress information can be incorporated into the network without positing extra desinences. Lexical entries give an index value which states the rank of the choice of stress pattern offered to them by membership of a specific inflectional class. If the index value is one, then this is inherited by default from the node NOMINAL (see earlier). This theory differs from that of Brown et al (1996) in that the node STRESS contains only one fact which states that the default is nothing. The node STRESS_B states that the plural is the same as the singular, and that the singular is stressed (on the ending).

The stress patterns are:

Pattern A (from the node STRESS)
- stress on stem in the singular; stress on stem in plural

Pattern B (from the node STRESS_B)
- stress on ending in the singular; stress on ending in the plural
Pattern C (from the node STRESS_C)
stress on stem in the singular; stress on ending in the plural

Pattern D (from the node STRESS_D)
stress on ending in the singular; stress on stem in the plural

Pattern Bi (from the node STRESS_Bi)
same as pattern B, except that stress is on stem in the plural nominative

Pattern Bii (from the node STRESS_Bii)
same as pattern Bi, except that stress is on stem in the singular accusative

Pattern Ci (from the node STRESS_Ci)
same as pattern C, except that stress is on stem in the plural nominative

Pattern Di (from the node STRESS_Di)
same as pattern D, except that stress is on stem in the singular accusative

STRESS:
<> == .

STRESS_B:
<> == STRESS
<stress pl> == <stress sg>
<stress sg> == @\..

STRESS_C:
<> == STRESS
<stress pl> == STRESS_B.

STRESS_D:
<> == STRESS
<stress sg> == STRESS_B.

STRESS_Bi:
<> == STRESS_B
<stress pl nom> == STRESS.

STRESS_Bii:
<> == STRESS_Bi
<stress sg acc> == STRESS.

STRESS_Ci:
<> == STRESS_C
<stress pl nom> == STRESS_Bi.

STRESS_Di:
<> == STRESS_D
<stress sg acc> == STRESS_Bii.

PLURALIA TANTUM BLOCKING

We have argued in chapters two and four that the ordering of features can account for loss of gender distinction in the plural and the fact that there are more cases in the singular than the plural. Note that we do not require nodes to block individual cases. The order
% of features also means that we can state in one fact about <mor sg>
% that it is undefined. If case were ordered before number, then we
% would have to state for each case that singular was undefined, thereby
% making it appear accidental that singular was undefined in nominative,
% undefined in accusative and so on. Note that there is no PLURALIA_III,
% because, the plural of N_III is indistinguishable from the soft plural
% of N_I.

PLURALIA_I:
  <mor> == "<mor pluralia>"
  <mor sg> == undefined
  <mor pluralia> == N_I:<mor>.

PLURALIA_II:
  <> == PLURALIA_I
  <mor pluralia> == N_II:<mor>.

PLURALIA_IV:
  <> == PLURALIA_II
  <mor pluralia> == N_II:<mor>.


% SINGULARIA TANTUM BLOCKING
% The same argumentation applies for singularia tantum nouns as for
% pluralia tantum. If case were ordered before number here, then we
% would have to list for every case that the plural was undefined.
% Furthermore, in support of our claim in chapter five that
% nouns do not have gender features in their morphological paths
% for realisation, the problem would also arise if we included
% gender features before number features, a problem that would probably
% arise if one wished to account for the fact that number is 'closer'
% to the stem and inherent. The problem would be even greater if
% gender and case were ordered before number, as this would mean
% a multiplication of the paths that would be required to be listed.
% In contrast to this, our statement that <mor pl> is undefined is
% explicit, economic, and makes the point that pluralia tantum and
% singularia tantum are to be expected, whereas genitive tantum, for
% example, is not.

SINGULARIA_I:
  <mor> == "<mor singularia>"
  <mor pl> == undefined
  <mor singularia> == N_I:<mor>.

SINGULARIA_II:
  <> == SINGULARIA_I
  <mor singularia> == N_II:<mor>.

SINGULARIA_III:
  <> == SINGULARIA_I
  <mor singularia> == N_III:<mor>.

SINGULARIA_IV:
  <> == SINGULARIA_I
  <mor singularia> == N_II:<mor>.
% SUFFIXES
% These nodes do not constitute a hierarchy. They define certain stem types. One defines plural stems that are augmented by /j/.
% The other defines stems of nouns such as angl‘ıč’an’in ‘Englishman’,
% which have their plural stem formed by truncating the -in. Certain
% of these type of nouns have the -in stressed. R_STEM accounts
% for mat' 'mother' and doč' 'daughter', which are augmented by
% -er in the singular oblique cases and the plural.

JOT_PL:
<stem pl> == "<infl_root all pl>" \^j %pl for donja
<stem pl final> == \^j.

IN_SG:
<stem pl> == "<infl_root all>"
<stem pl final> == consonant
<stem sg> == "<infl_root all>" 0' \^in
<stem sg final> == \^in.

IN_SG_2:
<> == IN_SG
<stem sg> == "<infl_root all>" 0' \i\in
<stem sg final> == IN_SG.

R_STEM:
<stem sg nom> == "<infl_root all>"
<stem> == "<infl_root all>" \^er'.

% The node ON_STEM
% This node is actually part of the lexemic hierarchy, because it inherits
% from NOUN, and lexical items inherit from it.
% It accounts for the 13 nouns listed in Zaliznjak (1977: 809) which
% follow the pattern of im'a 'name'. Note that it lists the declensional
% class as N_IV. Nouns of this type may differ in the oblique vowel
% which goes before the -n in the oblique cases and the plural (e.g. im'on
% 'of names', but sem'an 'of seeds'). Note that the fact which states
% that the morphological singular is inherited from N_III is not an OAP
% violation, because there is no statement at NOUN or higher which involves
% the morphological category of number being extended by the morphological
% category of case.

ON_STEM: %im'a and co
<> == NOUN
<declensional_class> == N_IV:<mor>
<stem sg nom> == "<infl_root all>"
<stem> == "<infl_root all>" "<oblique_vowel>" \n
<mor sg nom> == N_II
<mor sg> == N_III %not an OAP violation
<mor sg inst> == <stem> \^em. %softens the -n.
FLEETING VOWELS

These are the vowels that appear in either the singular nominative of class N_I nouns, or the plural genitive of class N_II or N_IV nouns. No theoretical claims are made on the basis of these nodes. Although one could claim that appearance of the fleeting vowel is a matter of syllabification and the vowel will be a mid vowel, it is still necessary to say whether it is the front /e/ or the back /o/. FL_V_1 states that there will be no vowel unless specifically stated for a particular number and case. For the singular nominative it specifies /e/. FL_V_2 inherits from FL_V_1 the generalisation that there will be no vowel unless the number and case are explicitly stated, but says that the singular nominative vowel is /o/. FL_V_1-II_IV has the same vowel for the plural genitive as FL_V_1 does for the singular nominative. FL_V_2-II_IV has the same vowel for the plural genitive as FL_V_2 has for the singular nominative. FL_V_3-II_IV specifies stressed fleeting vowel in the plural genitive, which would not be stressed otherwise (i.e. because the noun belongs to a particular stress pattern). FL_V_4-II_IV declares a stressed /\(\ddot{e}\)/ to be inserted in the plural genitive. Finally, nouns such as l'ubov' 'love' (sg nom) have a fleeting vowel in the singular nominative and singular instrumental.

FL_V_1:
<sg nom> == /\(^{e}\).

FL_V_2:
<sg nom> == FL_V_1
<sg nom> == /\(^{o}\).

FL_V_1-II_IV:
<pl gen> == FL_V_1:<sg nom>.

FL_V_2-II_IV:
<pl gen> == FL_V_1-II_IV
<pl gen> == FL_V_2:<sg nom>.

FL_V_3-II_IV:
<pl gen> == FL_V_1-II_IV
<pl gen> == FL_V_1-II_IV @V\(\ddot{e}\).

FL_V_4-II_IV:
<pl gen> == FL_V_1-II_IV
<pl gen> == FL_V_2-II_IV @V\(\ddot{e}\).

FL_V_2-III:
<sg inst> == FL_V_2:<sg nom> @". l'ubov'v'ju
The table gives information about declension class, stress pattern, optionality of the second locative and the preposition with which it occurs. The symbol combination Ï³ indicates secondary stress, where V stands for any vowel. Therefore É should not be read as standing for the so-called e oborotnœ, but rather the phoneme /e/ under secondary stress. The lexemes given in bold and larger print occur in the first 1500 items from Zasorina (1977).

<table>
<thead>
<tr>
<th>Lexeme</th>
<th>Gloss</th>
<th>Class</th>
<th>Stress Pattern</th>
<th>Optional?</th>
<th>Preposition</th>
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¹The variant with the second locative is marked as poetic by Zaliznjak.
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2 An archaic pattern for this noun.
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<td>'mouth'</td>
<td>I</td>
<td>B</td>
<td>No</td>
<td>V</td>
</tr>
<tr>
<td>ROV</td>
<td>'ditch'</td>
<td>I</td>
<td>B</td>
<td>No</td>
<td>V</td>
</tr>
<tr>
<td>SAD</td>
<td>'garden'</td>
<td>I</td>
<td>C</td>
<td>No</td>
<td>V</td>
</tr>
<tr>
<td>SEN'</td>
<td>'canopy'</td>
<td>III</td>
<td>A-</td>
<td>No</td>
<td>V</td>
</tr>
<tr>
<td>SET'</td>
<td>'net'</td>
<td>III</td>
<td>E</td>
<td>Yes</td>
<td>V</td>
</tr>
<tr>
<td>SKIT</td>
<td>'small monastery'</td>
<td>I</td>
<td>B</td>
<td>No</td>
<td>V</td>
</tr>
<tr>
<td>SMOTR</td>
<td>'(military) review'</td>
<td>I</td>
<td>C</td>
<td>No</td>
<td>Na</td>
</tr>
<tr>
<td>SNEG</td>
<td>'snow'</td>
<td>I</td>
<td>C</td>
<td>No⁴</td>
<td>Not specified</td>
</tr>
<tr>
<td>SOK</td>
<td>'juice'</td>
<td>I</td>
<td>A</td>
<td>Yes</td>
<td>Not specified</td>
</tr>
<tr>
<td>SPIRIT</td>
<td>'alcohol/spirit'</td>
<td>I</td>
<td>C</td>
<td>Yes</td>
<td>Not specified</td>
</tr>
<tr>
<td>STEP'</td>
<td>'steppe'</td>
<td>III</td>
<td>F&quot;/E</td>
<td>No</td>
<td>V</td>
</tr>
</tbody>
</table>

³ Zaliznjak includes this in his list of P2 items, because it has an ending in stressed -e, where one would expect -ě. The form zabiti'je can only be used with the preposition v. With the preposition o the form zabiti'je is used (Irina Tverdokhlebova personal communication). Hence this is a second locative, as it is restricted to use with the preposition v.

⁴ Zaliznjak states that the ordinary locative ending -e may be used poetically.
<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
<th>Pattern</th>
<th>Case</th>
<th>Poetic</th>
<th>Specified</th>
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<tbody>
<tr>
<td>STOG</td>
<td>'haystack'</td>
<td>I</td>
<td>C</td>
<td>Yes</td>
<td>Not specified</td>
</tr>
<tr>
<td>STROJ</td>
<td>'battle order'</td>
<td>I</td>
<td>C</td>
<td>No</td>
<td>V</td>
</tr>
<tr>
<td>SUK</td>
<td>'bough (of tree)'</td>
<td>I</td>
<td>B</td>
<td>No</td>
<td>Na</td>
</tr>
<tr>
<td>SUP</td>
<td>'soup'</td>
<td>I</td>
<td>C</td>
<td>Yes</td>
<td>V</td>
</tr>
<tr>
<td>SVET</td>
<td>'light'</td>
<td>I</td>
<td>A</td>
<td>No</td>
<td>Na</td>
</tr>
<tr>
<td>ŠKAF</td>
<td>'cupboard'</td>
<td>I</td>
<td>C</td>
<td>No</td>
<td>Not specified</td>
</tr>
<tr>
<td>ŠL'AX</td>
<td>'highway'</td>
<td>I</td>
<td>A/C</td>
<td>Yes</td>
<td>Na</td>
</tr>
<tr>
<td>ŠOLK</td>
<td>'silk'</td>
<td>I</td>
<td>C</td>
<td>Yes</td>
<td>Not specified</td>
</tr>
<tr>
<td>ŠČEL'</td>
<td>'fissure/crack'</td>
<td>III</td>
<td>E</td>
<td>Yes</td>
<td>V</td>
</tr>
<tr>
<td>TAZ</td>
<td>'bassin'</td>
<td>I</td>
<td>C</td>
<td>No</td>
<td>V</td>
</tr>
<tr>
<td>TAZ</td>
<td>'pelvis'</td>
<td>I</td>
<td>C</td>
<td>Yes</td>
<td>V</td>
</tr>
<tr>
<td>TEN'</td>
<td>'shade'</td>
<td>III</td>
<td>E</td>
<td>No</td>
<td>V</td>
</tr>
<tr>
<td>TIL</td>
<td>'back'</td>
<td>I</td>
<td>C</td>
<td>No</td>
<td>V</td>
</tr>
<tr>
<td>T'TŠ</td>
<td>'silence'</td>
<td>III</td>
<td>A</td>
<td>No</td>
<td>V</td>
</tr>
<tr>
<td>TOK</td>
<td>'birds' mating place'</td>
<td>I</td>
<td>C</td>
<td>No</td>
<td>Na</td>
</tr>
<tr>
<td>TÖK</td>
<td>'threshing floor'</td>
<td>I</td>
<td>C</td>
<td>No</td>
<td>Na</td>
</tr>
<tr>
<td>TORG</td>
<td>'market'</td>
<td>I</td>
<td>C</td>
<td>No</td>
<td>Na</td>
</tr>
<tr>
<td>ÚGOL</td>
<td>'corner'</td>
<td>I</td>
<td>B</td>
<td>No</td>
<td>Not specified</td>
</tr>
<tr>
<td>UGOLÔK</td>
<td>'corner' dim.</td>
<td>I</td>
<td>B</td>
<td>Yes</td>
<td>Not specified</td>
</tr>
<tr>
<td>VAL</td>
<td>'shaft'</td>
<td>I</td>
<td>C</td>
<td>No</td>
<td>Na</td>
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<tr>
<td>VAL</td>
<td>'rampart' or 'roller (wave)'</td>
<td>I</td>
<td>C</td>
<td>No</td>
<td>Na</td>
</tr>
<tr>
<td>VERX</td>
<td>'hood (of carriage)'</td>
<td>I</td>
<td>C</td>
<td>No</td>
<td>Na</td>
</tr>
<tr>
<td>VERX</td>
<td>'summit'</td>
<td>I</td>
<td>C</td>
<td>No</td>
<td>Not specified</td>
</tr>
<tr>
<td>VETER</td>
<td>'wind'</td>
<td>I</td>
<td>A/C</td>
<td>E</td>
<td>No</td>
</tr>
<tr>
<td>VOL'T</td>
<td>'vault'</td>
<td>I</td>
<td>A</td>
<td>No</td>
<td>Na</td>
</tr>
<tr>
<td>VOZ</td>
<td>'cart'</td>
<td>I</td>
<td>C</td>
<td>No</td>
<td>Na</td>
</tr>
<tr>
<td>XLEV</td>
<td>'cowshed'</td>
<td>I</td>
<td>C</td>
<td>Yes</td>
<td>V</td>
</tr>
<tr>
<td>ZABITJÔ</td>
<td>'drowsiness'</td>
<td>IV^6</td>
<td>B</td>
<td>No</td>
<td>V</td>
</tr>
<tr>
<td>ZAD</td>
<td>'backs'</td>
<td>I</td>
<td>C</td>
<td>No</td>
<td>Not specified</td>
</tr>
<tr>
<td>ZOB</td>
<td>'(bird's) crop'</td>
<td>I</td>
<td>C</td>
<td>Yes</td>
<td>V</td>
</tr>
<tr>
<td>ZAR</td>
<td>'heat/hot coals'</td>
<td>I</td>
<td>C</td>
<td>No</td>
<td>Not specified</td>
</tr>
<tr>
<td>ZIR</td>
<td>'fat'</td>
<td>I</td>
<td>C</td>
<td>Yes</td>
<td>Not specified</td>
</tr>
</tbody>
</table>

^5Pattern C is poetic.

^6The lexeme ZABITJÔ is included for exactly the same reason as POLUZABITJÔ.
APPENDIX VIII

Below we give the translation instructions and text which was translated by ten bilingual informants with Russian as their first language. It should be noted that there is a mistake in the original English text in that the word 'ancestors' should be replaced by one for the following generations, such as 'descendent'. Most translators assumed that it was a mistake, but it makes no difference to the outcome. The contexts referred to in table 7.3 in the translation text are italicized. Informants were not presented a version of the text with the contexts italicized.

Translation Instructions to Informant

Please translate the following short passage into Russian. Please could you indicate the stress on the Russian equivalents of the word underlined. Access to a monolingual English dictionary is permitted. Please do not use any bilingual dictionaries or Russian grammars.

Text for Translation

Different cultures have different conceptions of hell. There is even a tribe that believes there are six hells. These hells are referred to according to the colour of the flames burning in them. The green hell is feared most by people of the tribe. In the green hell are found the most gruesome demons and the foulest odours. Life in the red hell is not as bad as one would imagine, as sinners are given time off on certain feast days so that they may return to their ancestors and warn them of what awaits, if they do not behave.
This appendix contains the questionnaire given to 16 Russian informants. Each sentence was scored on a scale of one to four, where four is totally acceptable, and one unacceptable. The marks given here are the mean scores for the 16 informants rounded up to the nearest whole number. In certain cases sentences in italics are taken as a mean over 15 informants, either because the informant's response for the given question was not interpretable within the parameters set or, in one instance, because the sentence in question was not the same for the first informant who did the pilot study and suggested alterations.

(1)
На бале больше людей чем раньше.
На балу больше людей чем раньше.
На сегодняшнем бале больше людей чем на вчерашнем.
На сегодняшнем балу больше людей чем на вчерашнем.

(2)
Иван взял низкую ноту в басе.
Иван взял низкую ноту в басу.
Иван взял низкую ноту в хриплом басу.
Иван взял низкую ноту в хриплом басе.

(3)
Иван работает в цеху.
Иван работает в цехе.
Иван работает в новом цеху.
Иван работает в новом цехе.

(4)
Наш друг живет на бережке.
Наш друг живет на бережку.
Наш друг живет на противоположном бережке.
Наш друг живет на противоположном бережу.

(5)
Наш друг живет на береге.
Наш друг живет на берегу.
Наш друг живет на противоположном береге.
Наш друг живет на противоположном берегу.
(6)
| Много прекрасного в глазе. | [2] |
| Много прекрасного в глазу. | [2] |
| Много прекрасного в этом глазе. | [2] |
| Много прекрасного в этом глазу. | [2] |
| Много прекрасного в этом карем глазе. | [2] |
| Много прекрасного в этом карем глазу. | [2] |

(7)
| Муха в чае. | [4] |
| Муха в чаем. | [2] |
| Муха в выпитом Иваном чае. | [3] |
| Муха в выпитом Иваном чаем. | [1] |
| Муха в только-что выпитом Иваном чае. | [3] |
| Муха в только-что выпитом Иваном чаем. | [1] |

(8)
| Иван в долге. | [1] |
| Иван в долгы. | [4] |
| Иван в патриотическом долге. | [2] |
| Иван в патриотическом долгы. | [2] |
| Иван в карточном долге. | [3] |
| Иван в карточном долгы. | [3] |

1 The spelling error in this questionnaire may have had an influence on acceptability judgements.
APPENDIX X

Frequent nouns with a second locative are checked to see which others occur with them in Karaulov, Molčanov and Afanas’ev (1982).

Where an item listed under the heading does not obey all of (7.11), (7.12) or (7.13) and (7.15)-(7.17) it is not included. If, however, it does not obey these and it has a second locative, it is included. Items in bold are considered to be of special interest. Either because they obey the generalisations and do not have a second locative - which may suggest there are semantic factors disfavouring the second locative -, or because they disobey (7.14) and still have a second locative, which suggests there are semantic factors favouring the second locative.

We list below the glosses of frequent items which obey the generalisations, but do not appear as a heading in this appendix, because they don’t have a second locative:

FRONT '(war) front', KLUB 'puff (of smoke)', CERKOV' 'church', M'IR 'world', TON 'tone', ČAS 'hour', KOST' 'bone', ROG ' (animal) horn', ROST 'height/growth', PR'IZ 'prize', SLOJ 'layer', VLAST' 'power'.

BEREG 'shore' (pattern C)
   No associated items which obey (7.11)-(7.17) or have a second locative.

BOJ 'battle' (pattern C)
   FRONT (pattern C; obeys (7.11)-(7.17); does not have a second locative; among most frequent)
   POST (pattern B; does not obey (7.14); has a second locative; among most frequent)
   TIL (pattern C; obeys (7.11)-(7.17); has a second locative, among most frequent)

BOK 'side' (Pattern C) [BOK listed under the adjective BOKOVOJ]
   BORT 'board' (Pattern C; obeys (7.11)-(7.17); has a second locative: among most frequent)

BORT 'board' (Pattern C)
   Not listed separately.

BROV 'eyebrow' (Pattern E)
   No associated items which obey (7.11)-(7.17) or have a second locative.

CEP 'chain' (Pattern E)
   SNEG (Pattern C; obeys (7.11)-(7.17); has a second locative; among most frequent)
   STROJ (Pattern C; obeys (7.11)-(7.17); has a second locative; among most frequent)
CEX 'workshop' (Pattern A or C)
   Not listed.

ČAJ 'tea' (Pattern C: optional second locative)
PEČ' (Pattern E; obeys (7.11)-(7.17); has a second locative; not among most
'stove' frequent)
SOK (Pattern A; does not obey (7.14); has a second locative; not 'juice'
among most frequent)

DIM 'smoke' (Pattern C: optional second locative)
KLUB (Pattern A/C; does not quite obey (7.14); does not have a
'club' second locative; among most frequent)

DOM 'house' (Pattern C: highly optional second locative)
CERKOV' (Pattern E; obeys (7.11)-(7.17); does not have a second
'church' locative; among most frequent)
MTR (Pattern C; obeys (7.11)-(7.17); does not have a second
'world' locative; among most frequent)
POL (Pattern C; obeys (7.11)-(7.17); has a second locative; among most
'floor' frequent)
TON (Pattern C; obeys (7.11)-(7.17); does not have a second
'tone' locative; among most frequent)

DVER 'door' (Pattern E)
   No associated items which obey (7.11)-(7.17) or have a second locative.

GLAZ 'eye' (Pattern C)
SVET (PATTERN A-; does not obey (7.14)1; has a second
'light' locative; not among most frequent)

GOD 'year' (Pattern C/E)
ČAS (Pattern C; obeys (7.11)-(7.17); does not have a second locative (except 'year' in collocation v kotorom časú))
SVET (PATTERN A-; does not obey (7.14)2; has a second
'light' locative; not among most frequent)

GR'AZ 'dirt' (Pattern A)
BEREG (Pattern C; obeys (7.11)-(7.17); has a second locative; among the most
'shore' frequent)

GROB 'coffin' (Pattern C)
   Not listed.

---

1Nouns with hypothetical stress pattern A may actually be pattern C, or more precisely index 3, for declension I.

2See footnote 1.
<table>
<thead>
<tr>
<th>Term</th>
<th>Pattern</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRUD</td>
<td>'breast' (Pattern E)</td>
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</tr>
<tr>
<td>NOS</td>
<td>(Pattern C; obeys (7.11)-(7.17); has a second locative; among the most frequent)</td>
<td></td>
</tr>
<tr>
<td>PER'OD</td>
<td>(Pattern C; not clear if it obeys (7.12); has a second locative; not among the most frequent)</td>
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</tr>
<tr>
<td>TON</td>
<td>(Pattern C; obeys (7.11)-(7.17); does not have a second locative; among most frequent)</td>
<td></td>
</tr>
<tr>
<td>KRAJ</td>
<td>'edge' (Pattern C)</td>
<td></td>
</tr>
<tr>
<td>KROV</td>
<td>'blood' (Pattern E)</td>
<td></td>
</tr>
<tr>
<td>KOST</td>
<td>(Pattern E; obeys (7.11)-(7.17); does not have a second locative; among most frequent)</td>
<td></td>
</tr>
<tr>
<td>PUX</td>
<td>(Pattern A--; not clear whether it obeys (7.14); has a second locative; not among the most frequent)</td>
<td></td>
</tr>
<tr>
<td>ROG</td>
<td>(Pattern C; obeys (7.11)-(7.17); does not have a second locative; among most frequent)</td>
<td></td>
</tr>
<tr>
<td>ROST</td>
<td>(Pattern C; obeys (7.11)-(7.17); does not have a second locative; among most frequent)</td>
<td></td>
</tr>
<tr>
<td>SOK</td>
<td>(Pattern A; does not obey (13); has a second locative; not among the most frequent)</td>
<td></td>
</tr>
<tr>
<td>SPIRT</td>
<td>(Pattern C: optional; obeys (7.11)-(7.17); has second locative; does not occur in most frequent)</td>
<td></td>
</tr>
<tr>
<td>KRUG</td>
<td>'circle' (Pattern C)</td>
<td></td>
</tr>
<tr>
<td>LES</td>
<td>'forest' (Pattern C)</td>
<td></td>
</tr>
<tr>
<td>DUB</td>
<td>(Pattern C; obeys (7.11)-(7.17); has a second locative, not among the most frequent)</td>
<td></td>
</tr>
<tr>
<td>MOX</td>
<td>(Pattern B; obeys (7.11)-(7.17); has a second locative; not among the most frequent)</td>
<td></td>
</tr>
<tr>
<td>LOB</td>
<td>'forehead' (Pattern B)</td>
<td></td>
</tr>
<tr>
<td>L'OD</td>
<td>'ice' (Pattern B)</td>
<td></td>
</tr>
<tr>
<td>LUG</td>
<td>'meadow' (Pattern C)</td>
<td></td>
</tr>
<tr>
<td>BEREG</td>
<td>(Pattern C; obeys (7.11)-(7.17); has a second locative; among the most frequent)</td>
<td></td>
</tr>
<tr>
<td>ČAJ</td>
<td>(Pattern C: optional; obeys (7.11)-(7.17); has a second locative; among most frequent)</td>
<td></td>
</tr>
<tr>
<td>LES</td>
<td>(Pattern C; obeys (7.11)-(7.17); has a second locative; among most frequent)</td>
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<tr>
<td>L'ON</td>
<td>(Pattern B; does not obey (7.14); has a second locative; not among the most frequent)</td>
<td></td>
</tr>
<tr>
<td>M'IR</td>
<td>(Pattern C; obeys (7.11)-(7.17); does not have a second locative; among most frequent)</td>
<td></td>
</tr>
</tbody>
</table>

3 It does if we consider it to be an example of metathesis.
MOX ('moš') (Pattern B; obeys (7.11)-(7.17); has a second locative: not among the most frequent)
SAD ('garden') (Pattern C; obeys (7.11)-(7.17); has a second locative: among most frequent)

MOST 'bridge' (Pattern B/C)
BEREG ('shore') (Pattern C; obeys (7.11)-(7.17); has a second locative: among the most frequent)
PR'IZ ('prize') (Pattern C; obeys (7.11)-(7.17); does not have a second locative; not among most frequent)

MOZG 'brain' (Pattern C)
KOST' 'bone' (Pattern E; obeys (7.11)-(7.17); does not have a second locative; among most frequent)
KROV 'blood' (Pattern E; obeys (7.11)-(7.17); has a second locative: among most frequent)
LOB ('forehead') (Pattern B; does not obey (7.14); has a second locative; among most frequent)
NOS 'nose' (Pattern C; obeys (7.11)-(7.17); has a second locative: among the most frequent)
PUX 'fluff' (Pattern A-; not clear whether it obeys (7.14); has a second locative: not among most frequent)
ROG 'horn' (Pattern C; obeys (7.11)-(7.17); does not have a second locative; not among most frequent)
ROST 'height' (Pattern C; obeys (7.11)-(7.17); does not have a second locative; among most frequent)
SLOJ 'layer' (Pattern C; obeys (7.11)-(7.17); does not have a second locative; among most frequent)
SOK 'juice' (Pattern A; does not obey (7.14); has a second locative; not among most frequent)
ŽIR 'fat' (Pattern C; obeys (7.11)-(7.17); has a second locative: among most frequent)

NOČ 'night' (Pattern E)
ČAS 'hour' (Pattern C; obeys (7.11)-(7.17); does not have a second locative (except in collocation v kotorom času))
GOD (Pattern C/E; obeys (7.11)-(7.17); has second locative: among most frequent)

NOS 'nose' (Pattern C)
KOST' 'bone' (Pattern E; obeys (7.11)-(7.17); does not have a second locative; among most frequent)
PUX 'fluff' (Pattern A-; not clear whether it obeys (7.14); has a second locative: not among most frequent)
ROST 'height' (Pattern C; obeys (7.11)-(7.17); does not have a second locative; among most frequent)
VLAST 'power' (Pattern E; obeys (7.11)-(7.17); does not have second locative; among most frequent)

PAR 'steam' (Pattern C)
Not listed.
PIL’ 'dust' (Pattern E)
   Not listed.

POL 'floor' (Pattern C) [POL listed under POLI]
ŠKAF (Pattern C; obeys (7.11)-(7.17); has second locative; among most 'cupboard' frequent)

POLK 'regiment' (Pattern B)
   Not listed.

POST 'post' (Pattern B)
   Not listed.

R'AD 'row' (Pattern C)
   Not listed.

ROD 'kin' (Pattern C) [ROD listed under RODI]
DOM (Pattern C; obeys (7.11)-(7.17); has highly optional second 'house' locative; among most frequent)

ROT (Pattern C)
MOST (Pattern B/C; does not obey (7.14); has a second locative; 'bridge' among most frequent)

SAD (Pattern C)
BORT (Pattern C; obeys (7.11)-(7.17); has a second locative; among most 'board' frequent)
DUB (Pattern C; obeys (7.11)-(7.17); has a second locative, not among the 'oak' most frequent)
LES (Pattern C; obeys (7.11)-(7.17); has a second locative; among most 'forest' frequent)
LUG (Pattern C; obeys (7.11)-(7.17); has a second locative; among most 'meadow' frequent)
MOX (Pattern B; does not obey (7.14); has a second locative; not 'moss' among the most frequent)
PUX (Pattern A-; not clear whether it obeys (7.14); has a second 'fluff' locative; not among most frequent)
SOK (Pattern A; does not obey (7.14); has a second locative; not 'juice' among most frequent)

SNEG (Pattern C)
PUX (Pattern A-; not clear whether it obeys (7.14); has a second locative; not 'fluff' among most frequent)

STROI 'battle order' (Pattern C)
   Not listed.

ŠKAF 'cupboard' (Pattern C)
DVER' (Pattern E; obeys (7.11)-(7.17); has a second locative: among most 'door' frequent)

ŠČEL' 'fissure' (Pattern E: optional)
PAZ (Pattern C; obeys (7.11)-(7.17); has a second locative; not among most 'groove' frequent)
ROT (Pattern B; obeys (7.11)-(7.17); has a second locative: 'mouth' among most frequent)

TEN 'shadow' (Pattern E)
   Not listed.

TIL 'rearguard' (Pattern C)
   Not listed.

TOK 'threshing floor' (Pattern C)
   Not listed.

UGOL 'corner' (Pattern B)

KRAJ (Pattern C; obeys (7.11)-(7.17); has a second locative; among most 'edge' frequent)

MİR (Pattern C; obeys (7.11)-(7.17); does not have a second 'world' locative; among most frequent)

TIL (Pattern C; obeys (7.11)-(7.17); has a second locative, among most 'rearguard' frequent)

UGOLOK 'corner (dim.)' (Pattern B)
   Not listed. See UGOL.

VAL 'shaft' (Pattern C)
   Not listed.

VERX 'summit' (Pattern C) [VERX listed under the adjective VERXN'IJ]

CEP (Pattern E; obeys (7.11)-(7.17); has a second locative; among most 'chain' frequent)

LOB (Pattern B; does not obey (7.14); has a second locative; 'forehead' among most frequent)

ROT (Pattern B; obeys (7.11)-(7.17); has a second locative; among most 'mouth' frequent)

STROJ (Pattern C; obeys (7.11)-(7.17); has a second locative; among most 'battle order' frequent)

VETER 'wind' (Pattern A/C/E)
   No associated items which obey (7.11)-(7.17) or have a second locative.
APPENDIX XI

File: rusnoms8.dtr
Purpose: A fragment for the nominal system of Russian
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Address: LIS, University of Surrey, Guildford GU2 5XH
Documentation: Chapter Eight
Related Files: rusnoms7.dtr (based on rusnoms.dtr = 12.00)
Version: 12.18

This fragment represents the modified version of theory B (chapter eight) of Russian nominal inflection, embedded within the Network Morphology framework. As theory B, it posits an intermediate N_O class of 'o-stems' to state the oblique morphology which N_I and N_IV share.

In addition, it deals with the second locative. Nouns which belong to class N_I are evaluated for semantic and morphological information to determine whether they realise the second locative. Nouns of class N_III refer to N_I in order to share the evaluation. For both classes we capture the generalisation that the second locative is realised with the form of the singular dative with additional stress.

The fragment has been checked on the first 1500 noun lexemes from Zasorina (1977). The lexical items in question have been given additional semantic information regarding their 'tangibility'. Lexical entries have also been modified to state that the stem is monosyllabic or polysyllabic when this information would not be provided by default. The adjective and pronoun lexicons remain the same as for theories A (rusnoms6.dtr) and B (rusnoms7.dtr)

LOAD DECLARATIONS

These are the load declarations for the modified noun lexicons (here v-z8.dtr) and also the changed show declarations for nouns (to include the path for the second locative, namely <mor sg prep loc>). Otherwise, the lexicons are the same as for theories A and B.

```bash
# load 'v-z8.dtr'.
# load '../v4/v4.2/rusplex6.dtr'.
# load '../v4/v4.2/rusp6.dec'.
# load 'rusn8.dec'.
# load '../v4/v4.2/rusalex6.dtr'.
# load '../v4/v4.2/rusa6.dec'.
```

WORD CLASS HIERARCHY
% The node NOMINAL
% This node remains the same as for theory B. Statements about lexemes
default to the empty sequence. The stem is the same as all of the
'inflectional root'. The default phonological hardness of a stem is
'hard'. Nouns bear the index 1 for stress assignment, which means for
all nominals that they will be assigned the default stress, no stress on
the ending. To determine the morphology of nominals evaluate the final
element of the root and go to the node PARADIGM. The final element of the
root is by default a consonant.

NOMINAL:
<> ==
<stem> == "<infl_root all>
<phon stem hardness> == hard
<index> == 1
<mor> == PARADIGM:"<infl_root final>"
<stress> == <mor "<index>"
<infl_root final> == consonant.

% The node ADJ
% This node remains the same as for theory B. ADJ inherits from nominal
% and assigns class A_I as the default inflectional class for adjectives.

ADJ:
<> == NOMINAL
<syn cat> == adj
<declensional_class> == A_I:<mor>.

% The node NOUN
% This node remains the same as for theory B except that there is
% now a default statement that a lexical item by default denotes
% a tangible thing.
% NOUN inherits from NOMINAL. It assigns declensional class by
evaluating the semantics of (biological) sex. Gender is also
assigned by evaluating sex. Syntactic animacy is determined
according to the semantics. By default (syntactic) person is third
and semantic objects are undifferentiated for sex.

NOUN:
<> == NOMINAL
<declensional_class> == DECLENSION:< "<sem sex>" >
<syn cat> == n
<syn gender> == GENDER:< "<sem sex>" >
<syn animacy> == "<sem animacy>"
<sem animacy> == ANIMACY:< "<sem sex>" >
<syn person> == third
<sem sex> == undifferentiated
<sem tangibility> == tangible. *by default, things are tangible.

% The node PRONOUN
% This node remains the same as for theory B. The default syntactic
% animacy of pronouns is animate, because pronouns have genitive-accusative
% syncretism. The morphology of the singular accusative involves
% evaluation of gender and animacy. The morphological case of feminine
% animates is the same as the morphological case of masculine animates, and
% the morphological case of neuter animates is the same as the
% morphological case of masculine animates. This is because the third
% person pronouns have genitive-accusative syncretism for feminine and
% neuter pronouns in the singular.
PRONOUN:
<> == NOUN
<syn animacy> == animate
<mor sg acc> == ACCUSATIVE:<sg "<syn gender>" "<syn animacy>" >
<mor case fem animate> == "<mor case masc animate>"
<mor case neut animate> == "<mor case masc animate>">
<sem sex context1> == male
<sem sex context2> == female
<syn gender context3 masc> == masc
<syn gender context3 fem> == fem
<syn gender context3 neut> == neut.

We may query pronouns for three 'context' types: the first context where we know that the referent of the pronoun is male; the second context where we know that the referent of the pronoun is female. The derivable theorems for these two contexts tell us that the syntactic gender is masculine and feminine respectively. The third context is the one where the semantics cannot help us to determine the gender of the pronoun. Instead, the gender is determined by the gender of the antecedent (masc, fem, or neut).

SOME INTERDEPENDENCIES

The node ACCUSATIVE
This node remains the same as for theory B. The singular (accusative) will take the form of the appropriate morphological case: if masc animate, then genitive; if fem or neut, then the default nominative. The plural (accusative) will take the form of the appropriate morphological case: if animate, then genitive; if inanimate, then the default nominative. See the MOR_NOMINAL node for statements about morphological case.

ACCUSATIVE:
<sg> == "<mor sg "<mor case>" ">
<pl> == "<mor pl "<mor case>" ">

The node ADJ_VOWEL
This node remains the same as for theory B. If unstressed the vowel in question is /i/. If stressed the vowel in question is /o/. This is used for the vowel alternation in the singular nominative masculine of A_I adjectives (e.g. krutój 'steep / hard' -vs- novij 'new').

ADJ_VOWEL:
<> == ^i
<@\"> == ^o.

The node ADJ_OR_NOUN (see over)
This node remains the same as for theory B. In contrast with Fraser and Corbett (1995) this theory does not have a separate declensional class for indeclinable nouns (class V). At NOMINAL we saw that the final element of the root is evaluated to determine morphology. At PARADIGM (see later) we see that if the final element is a vowel, we should go to ADJ_OR_NOUN. The first line at ADJ_OR_NOUN says that, in the absence of any information about animacy, one should go to MOR_WORD (where morphology defaults to the bare stem). Note that this means that there is a route from NOMINAL to PARADIGM to ADJ_OR_NOUN to MOR_WORD for any
% item that ends in a vowel as final element of the root/stem, and which
% does not specify any value for animacy. Such an item is an indeclinable
% adjective. On the other hand, any item of which the root/stem ends
% in a vowel, but which specifies a value for animacy is an indeclinable
% noun. The paths <animate 1> and <inanimate 1> state the value for
% (ending) stress as being the default pattern found at STRESS (no stress).
% Finally, the generalisations about the formal gender of indeclinable
% nouns stated by Fraser and Corbett (1995) at the node N_V are stated
% here. Animate indeclinables are masculine, and inanimate indeclinables
% are neuter.

ADJ_OR_NOUN:
  <> == MOR_WORD:<mor>
  <animate 1> == STRESS:<stress>
  <inanimate 1> == <animate 1>
  <animate formal gender> == masc
  <inanimate formal gender> == neut.

% The node ANIMACY
% This node remains the same as for theory B. Semantic animacy at the node
% NOUN requires evaluation of biological sex. There are three values for
% sex: male, female, undifferentiated. Male and female will match with the
% empty path to yield 'animate' as the value for animacy. Items
% undifferentiated for sex will be 'inanimate'.

ANIMACY:
  <> == animate
  <undifferentiated> == inanimate.

% The node DECLENSION
% This node remains the same as for theory B. If the noun in question
% denotes a male, it should belong in class I. If it denotes a female, it
% should belong in class II.

DECLENSION:
  <male> == N_I:<mor>
  <female> == N_II:<mor>.

% The node GENDER
% This node remains the same as for theory B. If the noun denotes a male,
% then the gender is masculine. If the noun denotes a female, then the
% gender is feminine. If the noun is undifferentiated for sex, then the
% gender will be assigned according to the declensional class.

GENDER:
  <male> == masc
  <female> == fem
  <undifferentiated> == "<mor formal gender>".

% The node GEN_PL
% This node remains the same as for theory B. It is referred to by class
% IV (the node N_IV). The default for N_IV is to have the same plural
% genitive as N_II. However, if the final element of the stem is /j/, then
% N_IV will have the same plural genitive as N_I. This captures one of the
% switches dealt with in Brown and Hippisley (1994), but in a slightly more
% elegant way.

GEN_PL:
  <> == N_II:<mor pl gen>
  '"j>' == N_I:<mor hard pl gen>.

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% The node MGP
% This node remains the same as for theory B. It is referred to by
% MOR_NOUN, which requires an evaluation of stem hardness. The first line
% says that a noun should look at what its own morphology (declension)
% says, if it is not soft. This covers class I, where there is a statement
% about <mor hard pl gen>. Finally, if the noun stem is soft, then the
% ending is -ej. Again, this captures the generalisations made in Brown
% and Hippisley (1994).

MGP:
<> == "<mor>
<soft> == "<stem pl>" \^ ej "<stress pl>".

% The node NOM_PL
% This node remains the same as for theory B. It is referred to by class
% I, which evaluates the stress index of the lexical item. If the stress
% index is not 3 (pattern C stress for class I), then the stem final
% element in the plural and the stem final element in the singular are
% evaluated, and the corresponding value defined at NOM_PL2
% If the index is 3, then the noun should have -á in the plural nominative
% (e.g. beregá 'shores').

NOM_PL:
<> == NOM_PL2:<"<stem pl final>" "<stem sg final>" >
<3> == N_IV:<mor pl nom>. %stressed -a N_Is

% The node NOM_PL2
% This node remains the same as for theory B. The default is to follow
% the plural nominative as inherited at MOR_NOUN. Note that there is no
% statement of what the plural nominative is at MOR_NOUN. We could refer
% to MOR_NOMINAL. In chapter six, we did not deal with these alternations
% in class I, which generally follows the default ending. If the plural
% stem ends in /j/ then the plural nominative will be -á (e.g. bratja
% 'brothers'). Finally, a class I noun which ends in any consonant in the
% plural and -in in the singular will have the ending /e/, such as
% angl'íč'ane 'Englishmen'.

NOM_PL2:
<> == MOR_NOUN:<mor pl nom>
<\j> == N_IV:<mor pl nom>
<consonant \"in> == "<stem pl>" \^e. %angl'ich'ane

% The node PARADIGM
% This node remains the same as for theory B. It is referred to by
% NOMINAL. If a root/stem ends in a vowel, then determine what its animacy
% is. (This will help you to decide what its gender is, because it is
% indeclinable.) If the noun ends in a consonant, then its morphology (see
% statement at NOMINAL) is given by its declensional class.

PARADIGM:
<vowel> == ADJ_OR_NOUN:"<sem animacy>"
<consonant> == "<declensional_class>".

% The node STEMSTRESS (see over)
% This node remains the same as for theory B. It is referred to by class
% N_II. If the noun is not a soft stem noun with ending stress in the
% plural, then it will consist of the plural genitive stem only and the
% value for ending stress. If the noun is a soft stem noun with ending
% stress in the plural, then refer to MGP, which states that the ending of
% soft stems is -ej, and stressed soft is an extension of soft, so the noun
% will have the ending -ej.

STEMSTRESS:
<> == "<stem pl gen>" "<stress pl>
<soft @"> == MGP.

% The node SYLLABICITY [section 8.4]
% At the node MOR NOMINAL (see later) the index of the lexical item
% in question is evaluated and used as an attribute in a path at
% this node. If the index is anything other than index 1, then the item
% is monosyllabic. As 1 is the default index, the default is to be
% be polysyllabic. The effect of this is that any lexical item which
% has an index other than 1 and has a polysyllabic stem must specify that
% it is polysyllabic. Any item which has index 1 and is monosyllabic must
% specify that it is monosyllabic.

SYLLABICITY:
<> == monosyllabic
<1> == polysyllabic.

% The node PREP LOC [section 8.4]
% The first two facts specify the form that the second locative realisation
takes.
*Fact 1: if there is no match with any extensions of the <inanimate>
path, then the realisation will be <mor sg prep>.
*Fact 2: the second locative is realised by referring to the singular
dative and stressing the form. This fact is only accessed, if the
lexical item evaluates to an extension of <inanimate> which is
specified at the node PREP LOC.
*Fact 3: inanimate body parts of class I (masculine hard) nouns which are
monosyllabic and have index 3 (pattern C stress) realise the
the second locative.
*Fact 4: inanimate body parts of class I (masculine hard) nouns which are
monosyllabic and have index 2 stress follow their counterparts with
index 3.
*Fact 5: inanimate body parts of class III (feminine and soft)
monosyllabic nouns follow their class I counterparts.
*Fact 6: inanimate tangible class I (masculine hard) nouns which are
monosyllabic with index 3 have a second locative realisation.
*Fact 7: inanimate tangible class III (feminine and soft) nouns which
are monosyllabic with index 2 follow inanimate tangible class I
nouns with index 3.

PREP LOC:
<> == "<mor sg prep>"
<mor sg prep loc> == "<mor sg dat>" @"
<inanimate body_part masc hard monosyllabic 3> == <mor sg prep loc>
<inanimate body_part masc hard monosyllabic 2> ==
<inanimate body_part masc hard monosyllabic 3>
<inanimate body_part fem soft monosyllabic> ==
<inanimate body_part masc hard monosyllabic>
<inanimate tangible masc hard monosyllabic 3> == <mor sg prep loc>
<inanimate tangible fem soft monosyllabic 2> ==
<inanimate tangible masc hard monosyllabic 3>.

DECLENSIONAL CLASS HIERARCHY
% The node MOR_WORD
% This node remains the same as for theory B. Morphological words by
% default consist of the stem and some value for stress. The pattern which
% goes with index 1 is STRESS, where no stress is defined.

MOR_WORD:
<mor> == "<stem>" "<stress>"
<mor 1> == STRESS:<stress>.

% The node MOR NOMINAL [section 8.4]
% This node remains the same for theory B, except that an additional
% fact is added which refers to the node SYLLABICITY (see earlier).
% MOR NOMINAL inherits from MOR WORD.
% This node differs from the equivalent one in theory A in that there are
% no facts about the realisation of the singular genitive and singular
% dative.
% * Extensions of <mor case>
% The extensions of the path <mor case> tell us what the morphological
% case of animates and inanimates is. If something is masculine animate
% then it behaves as animate masculine. This is because the order of
% features evaluated for the singular accusative differs from the order for
% the plural accusative (a reason to differentiate the two). The default
% morphological case is nominative. The morphological case for animates is
% genitive. Morphological case allows for mismatches between actual case
% (accusative) and the form that realizes it (nominative or genitive),
% similar to items which have a different syntactic gender from the one
% they would be assigned formally. If an item is phonologically hard, then
% it is morphologically hard.
% The second choice of stress for nominals <mor 2> is stress pattern B.
% The singular accusative requires an evaluation of gender and animacy.
% As there is no extension of <mor case> involving fem or neut, the
% case form for these, irrespective of animacy, is nominative.
% The plural accusative evaluates animacy only.
% The other paths state what is in chapter six, with the addition
% of information about stress and whether the stem is a plural stem.
% The path <mor vowel sg> is used in the singular instrumental of
% class II and in the adjective classes, so that it is possible
% to deal with the pronouns such as ona, which have a different
% vowel from the adjective and noun in the instrumental
% singular, but otherwise the same ending (e.g. j-e-ju -vs-
% nov-o-ju. The same is also done with other adjectival endings (e.g.
% nov-o-j singular genitive, singular dative and singular prepositional
% -vs- n-e-j, which encodes the same number and case distinctions).

MOR NOMINAL:
<> == MOR WORD
<mor case masc animate> == "<mor case animate masc>"
<mor case> == nom
<mor case animate> == gen
<mor stem hardness> == "<phon stem hardness>"
<mor stem syllabicity> == SYLLABICITY:< "<index>" >
<mor 2> == STRESS_B:<stress>
<mor sg acc> ==
   ACCUSATIVE:< sg "<syn gender>" "<syn animacy>" >
<mor pl acc> == ACCUSATIVE:< pl "<syn animacy>" >
% The node MOR_NOUN
% This node remains the same for theory B. As with theory B it specifies
% a noun default for singular dative, which is the referral to singular
% prepositional. There is a noun default for the singular prepositional.
% For the plural genitive the evaluation is of the hardness of the noun
% stem. The theme vowel for nouns is -a.

MOR_NOUN:
<> == MOR_NOMINAL
<mor sg dat> == "<stem sg prep>" \\ e "<stress sg>"
<mor sg prep> == "<stem sg>" \\ e "<stress sg>"
<mor sg gen> == "<stem sg gen>" \\ a "<stress sg>"
<mor theme_vowel> == "<stress sg>11."

% The node N_O
% This node remains the same as for theory B. The node N_O states
% the realisation of singular genitive and singular dative and singular
% instrumental.

N_O:
<> == MOR_NOUN
<mor sg gen> == "<stem sg gen>" \\ a "<stress sg>"
<mor sg dat> == "<stem sg>" \\ u "<stress sg>"
<mor sg inst> == "<stem sg>" \\ om "<stress sg>".

% The node N_I [sections 8.3 and 8.4]
% This node is the same as for theory B, except that the complex evaluation
% to determine whether a noun can realise the second locative is
% stated here. The semantics of animacy and tangibility (whether
% body part, tangible or abstract) must be evaluated along with
% formal gender, stem hardness, stem syllabicity (number of syllables)
% and the index of the noun in question. Formal gender is used
% to differentiate class I nouns from class III nouns which inherit
% the evaluation from class I via a network relation. The node
% PREP_LOC (see earlier) then specifies whether a lexical item may
% realise the second locative.
% As with theory B N_I inherits from N_O. The third, fourth, fifth and
% sixth choices of stress pattern are C, Ci, D and Bi respectively (see
% later for explanation of stress patterns). The formal gender assigned,
% if there is no assignment by semantics, is masculine. As with the full
% DATR representation of theory B, this theory includes a fact about the
% plural nominative. Class N_I follows the nominal default, but there are
% subclasses which require evaluation (see explanation of nodes PL_NOM and
% PL_NOM2 earlier). The hard plural genitive is stem plus -ov.

N_I:
<> == N_O
<mor 3> == STRESS_C:<stress>
<mor 4> == STRESS_Ci:<stress>
<mor 5> == STRESS_D:<stress>
<mor 6> == STRESS_Bi:<stress>
<mor formal gender> == masc
<mor pl nom> == NOM_PL:"<index>"
<mor pl gen> == "<stem pl>" ^ ov "<stress pl>"
<mor sg prep loc> ==
PREP_LOC:< "<sem animacy>" "<sem tangibility>"
"<mor formal gender>" "<mor stem hardness>"
"<mor stem syllabicity>" "<index> >.

% The node N_IV
% This node remains remains the same as for theory B. As with N_I in
% theory B N_IV inherits from the node N_O its oblique morphology in the
% singular. Stress patterns D, C, Bi and Ci are the third, fourth, fifth
% and sixth choices. The formal gender of this class is neuter. The
% singular nominative is -o. Note the reference to <stress pronoun> on
% the right-hand side. This is because class A_II refers to
% N_IV for the realisation of singular nominative neuter and the lexeme
% ON 'he/she/it' belongs to class A_II, except that we must specify a
% special pronoun stress, because of jevo, for example. We must also do
% this here. The plural nominative is -a. The plural
% genitive involves evaluation of the final element of the stem (see
% explanation of GEN_PL).

N_IV:
<> == N_O
<mor 3> == STRESS_D:<stress>
<mor 4> == STRESS_C:<stress>
<mor 5> == STRESS_Bi:<stress>
<mor 6> == STRESS_Ci:<stress>
<mor formal gender> == neut
<mor sg nom> == "<stem sg nom>" ^ o "<stress sg>" "<stress pronoun>"
<mor pl nom> == "<stem pl>" ^ a "<stress pl nom>"
<mor pl gen> == GEN_PL:"<stem pl final> >.

% The node N_II
% This node remains remains the same as for theory B. N_II inherits
% directly from MOR_NOUN. The third, fourth, fifth, sixth and seventh
% stress patterns are D (via N_IV), Bi, Bii, Di and Ci respectively.
% The singular nominative includes reference to pronoun stress in order to
% deal with the stress of oná. The stress of the singular accusative may
% differ from the rest of the singular stress paradigm (e.g. patterns
% Bii and Di). We find that the singular genitive has to be specified at
% N_II. This is because there would be two path identities with N_O at
% MOR_NOUN, if it were placed there. The plural genitive requires
% evaluation of stem hardness and plural stress (see explanation of
% STEMSTRESS).

N_II:
<> == MOR_NOUN
<mor 3> == N_IV
<mor 4> == STRESS_Bi:<stress>
<mor 5> == STRESS_Bii:<stress>
<mor 6> == STRESS_Di:<stress>
<mor 7> == STRESS_Ci:<stress>
<mor sg nom> == "<stem sg nom>" ^ a "<stress sg>" "<stress pronoun>"
<mor sg acc> == "<stem sg>" ^ u "<stress sg acc>"
<mor sg gen> == "<stem sg>" ^ i "<stress sg>"
<mor sg inst> == "<stem sg inst>" "<mor vowel sg>" "<stress sg>" ^ j '(' u ')' 
<mor pl gen> == STEMSTRESS:"<mor stem hardness>" "<stress pl>" 
<mor formal gender> == fem.
The node N_III [section 8.4]
This node adds an additional fact to those in theory B. The realisation of the second locative <mor sg prep loc> is obtained by reference to N_I.
The second stress pattern is Ci, and the third choice pattern B. All members of this class are morphologically soft. The singular genitive is inherited orthogonally by a network relation from N_II. The singular prepositional is referred to the singular genitive. Note that we do not need to put a stress path next to the -ju ending of the singular instrumental, as -ju is never stressed. The formal gender of nouns belonging to N_III is feminine.

N_III:
<> == MOR_NOUN
<mor 2> == STRESS_Ci:<stress>
mor 3> == STRESS_B:<stress>
mor stem hardness> == soft
mor sg gen> == N_II
mor sg prep> == "<mor sg gen>"
mor sg prep loc> == N_I
mor sg inst> == "<stem sg inst>" \^ ju %ending is never stressed
mor formal gender> == fem.

ADJECTIVE INFLECTION

The node MOR_ADJ
This node remains the same as for theory B. It inherits from MOR_NOMINAL. The singular genitive and singular dative defaults for adjectives are at this node: -ovo and -omu.
Other points:
* The singular genitive feminine refers to the singular prepositional (the opposite asymmetry from class N_III).
* The singular dative feminine is obtained by reference to the node MOR_NOUN, where it is stated that the singular dative is the same as the singular prepositional. As the singular dative feminine is an extension of the singular dative, so the singular prepositional will be extended by the fem feature, which means that we refer back to the singular prepositional feminine for the realisation of the singular dative feminine.
* The singular instrumental feminine refers to N_II.
* The singular instrumental (masculine and neuter), singular prepositional (masculine and neuter) and singular prepositional feminine are all direct realisations.
* The theme vowel -i- occurs in the oblique cases of the plural.

MOR_ADJ:
<> == MOR_NOMINAL
<mor sg gen> ==
"<stem>" "<mor vowel sg>" "<stress sg>" \^ vo "<stress pronoun>"
mor sg gen fem> == "<mor sg prep fem>"
mor sg dat> ==
"<stem>" "<mor vowel sg>" "<stress sg>" \^ mu "<stress pronoun>"
mor sg dat fem> == MOR_NOUN
mor sg inst> == "<stem>" \^ i "<stress sg>" \^ m
mor sg inst fem> == N_II
mor sg prep> == "<stem>" "<mor vowel sg prep>" "<stress sg>" \^ m
mor sg prep fem> == "<stem>" "<mor vowel sg>" "<stress sg>" \^ j
mor theme_vowel> == \^ i.
% The node A_I
% This node remains remains the same as for theory B. It inherits from
% the node MOR_ADJ. It accounts for the majority of attributive
% adjectives. The singular nominative masculine combines
% the singular stem with -ij or -òj, depending on the stress of the
% adjective (see ADJ_VOWEL earlier). The singular nominative feminine
% refers to N_II and combines this with the augment -ja. The singular
% neuter refers to the node N_IV and combines the value with the augment
% -je. The plural nominative combines the plural theme vowel with -je.
% Finally, the singular accusative feminine combines the value for singular
% accusative at N_II with the augment -ju.

A_I:
<> == MOR_ADJ
<mor sg nom fem> == N_II \^ja
<mor sg nom neut> == N_IV \^je
<mor sg acc fem> == N_II \^ ju
<mor sg nom masc> == "<stem sg>" ADJ_VOWEL:"<stress sg>" \^j
<mor pl nom> == "<stem pl>" "<mor theme_vowel>" "<stress pl>" \^ je.

% The node A_II
% This node remains remains the same as for theory B. It inherits from
% MOR_ADJ. It states the singular nominative feminine is inherited from
% N_II, the singular nominative neuter from N_IV, and the singular accusative
% feminine from N_II.

A_II:
<> == MOR_ADJ
<mor sg nom fem> == N_II
<mor sg nom neut> == N_IV
<mor sg acc fem> == N_II.

% The node A_III
% This node remains remains the same as for theory B. It inherits from
% MOR_ADJ. It states that it inherits its singular nominative feminine from
% N_II, its singular nominative neuter from N_IV, and its singular
% accusative feminine from N_II.
% *The referral of singular genitive neuter to singular genitive
% masculine indicates a redundancy in the system.
% *The referral of singular dative neuter to singular dative masculine
% indicates another redundancy.
% *This is in line with the historical trend to eliminate the endings
% -u and -a in the adjectival paradigm.

A_III:
<> == MOR_ADJ
<mor sg nom fem> == N_II
<mor sg nom neut> == N_IV
<mor sg acc fem> == N_II
<mor sg gen neut> == "<mor sg gen masc>"
<mor sg dat neut> == "<mor sg dat masc>"
<mor sg gen masc> == N_I
<mor sg dat masc> == N_I.

STRESS HIERARCHY
THE STRESS HIERARCHY

This hierarchy remains the same as for theory B.
Brown, Corbett, Fraser, Hippisley and Timberlake (1996) demonstrate how stress information can be incorporated into the network without positing extra desinences. Lexical entries give an index value which states the rank of the choice of stress pattern offered to them by membership of a specific inflectional class. If the index value is one, then this is inherited by default from the node NOMINAL (see earlier). This theory differs from that of Brown et al (1996) in that the node STRESS contains only one fact which states that the default is nothing. The node STRESS_B states that the plural is the same as the singular, and that the singular is stressed (on the ending).

The stress patterns are:

- Pattern A (from the node STRESS): stress on stem in the singular; stress on stem in plural
- Pattern B (from the node STRESS_B): stress on ending in the singular; stress on ending in the plural
- Pattern C (from the node STRESS_C): stress on stem in the singular; stress on ending in the plural
- Pattern D (from the node STRESS_D): stress on ending in the singular; stress on stem in the plural
- Pattern Bi (from the node STRESS_Bi): same as pattern B, except that stress is on stem in the plural nominative
- Pattern Bii (from the node STRESS_Bii): same as pattern Bi, except that stress is on stem in the singular accusative
- Pattern Ci (from the node STRESS_Ci): same as pattern C, except that stress is on stem in the plural nominative
- Pattern Di (from the node STRESS_Di): same as pattern D, except that stress is on stem in the singular accusative

STRESS:
<> == .

STRESS_B:
<> == STRESS
<stress pl> == <stress sg>
<stress sg> == @".

STRESS_C:
<> == STRESS
<stress pl> == STRESS_B.

STRESS_D:
<> == STRESS
<stress sg> == STRESS_B.

STRESS_Bi:
<> == STRESS_B
<stress pl nom> == STRESS.
STRESS_Bii:
 <> == STRESS_Bi
 <stress sg acc> == STRESS.

STRESS_Ci:
 <> == STRESS_C
 <stress pl nom> == STRESS_Bi.

STRESS_Di:
 <> == STRESS_D
 <stress sg acc> == STRESS_Bii.

% PLURALIA TANTUM BLOCKING

% PLURALIA TANTUM BLOCKING
% These nodes remain the same as for theory B.
% We have argued in chapters two and four that the ordering of features
% can account for loss of gender distinction in the plural and the
% fact that there are more cases in the singular than the plural.
% Note that we do not require nodes to block individual cases. The order
% of features also means that we can state in one fact about <mor sg>
% that it is undefined. If case were ordered before number, then we
% would have to state for each case that singular was undefined, thereby
% making it appear accidental that singular was undefined in nominative,
% undefined in accusative and so on. Note that there is no PLURALIA_III,
% because, the plural of N_III is indistinguishable from the soft plural
% of N_I.

PLURALIA_I:  %There is no PLURALIA_III
 <mor> == "<mor pluralia>"
 <mor sg> == undefined
 <mor pluralia> == N_I:<mor>.

PLURALIA_II:
 <> == PLURALIA_I
 <mor pluralia> == N_II:<mor>.

PLURALIA_IV:
 <> == PLURALIA_II
 <mor pluralia> == N_IV:<mor>.

% SINGULARIA TANTUM BLOCKING

% SINGULARIA TANTUM BLOCKING (see over)
% These nodes remain the same as for theory B.
% The same argumentation applies for singularia tantum nouns as for
% pluralia tantum. If case were ordered before number here, then we
% would have to list for every case that the plural was undefined.
% Furthermore, in support of our claim in chapter five that
% nouns do not have gender features in their morphological paths
% for realisation, the problem would also arise if we included
% gender features before number features, a problem that would probably
% arise if one wished to account for the fact that number is ‘closer’
% to the stem and inherent. The problem would be even greater if % gender and case were ordered before number, as this would mean % a multiplication of the paths that would be required to be listed. % In contrast to this, our statement that <mor pl> is undefined is % explicit, economic, and makes the point that pluralia tantum and % singularia tantum are to be expected, whereas genitive tantum, for % example, is not.

SINGULARIA_I:
<mor> == "<mor singularia>"
<mor pl> == undefined
<mor singularia> == N_I:<mor>.

SINGULARIA_II:
<> == SINGULARIA_I
<mor singularia> == N_II:<mor>.

SINGULARIA_III:
<> == SINGULARIA_I
<mor singularia> == N_III:<mor>.

SINGULARIA_IV:
<> == SINGULARIA_I
<mor singularia> == N_IV:<mor>.

SUFFIXES
% SUFFIXES
% These nodes remain the same as for theory B. They do not constitute a % hierarchy. They define certain stem stem types. One defines plural % stems that are augmented by /j/. The other defines stems of nouns such % as angli'can' 'Englishman', which have their plural stem formed by % truncating the -in. Certain of these type of nouns have the -in stressed. % R_STEM accounts for mat' 'mother' and doč' 'daughter', which are % augmented by -er in the singular oblique cases and the plural.

JOT_PL:
<stem pl> == "<infl_root all pl>\j %pl for donja
<stem pl final> == \^j.

IN_SG:
<stem pl> == "<infl_root all>"
<stem pl final> == consonant
<stem sg> == "<infl_root all>\in
<stem sg final> == \^in.

IN_SG_2:
<> == IN_SG
<stem sg> == "<infl_root all>\in\i\n<stem sg final> == IN_SG.

R_STEM:
<stem sg nom> == "<infl_root all>"
<stem> == "<infl_root all>\er'.

% The node ON_STEM (see over)
% This node remains the same as for theory B. It is actually part of the % lexemic hierarchy, because it inherits from NOUN, and lexical items
% inherit from it. It accounts for the 13 nouns listed in Zaliznjak (1977: 809) which follow the pattern of im’a 'name'. Note that it lists the declensional class as N_IV. Nouns of this type may differ in the oblique vowel which goes before the -n in the oblique cases and the plural (e.g. im’on 'of names', but sem’an 'of seeds'). Note that the fact which states that the morphological singular is inherited from N_III is not an OAP violation, because there is no statement at NOUN or higher which involves the morphological category of number being extended by the morphological category of case.

ON_STEM:
<> == NOUN
<declensional_class> == N_IV:<mor>
<stem sg nom> == "<infl_root all>"
<stem> == "<infl_root all>" "<oblique_vowel>" \n
<mor sg nom> == N_II
<mor sg> == N_III %not an OAP violation
<mor sg inst> == <stem> \em. %softens the -n.

FLEETING VOWELS

The nodes remain the same as for theory B.
These are the vowels that appear in either the singular nominative of class N_I nouns, or the plural genitive of class N_II or N_IV nouns.
No theoretical claims are made on the basis of these nodes. Although one could claim that appearance of the fleeting vowel is a matter of syllabification and the vowel will be a mid vowel, it is still necessary to say whether it is the front /e/ or the back /o/. FL_V_1 states that there will be no vowel unless specifically stated for a particular number and case. For the singular nominative it specifies /e/. FL_V_2 inherits from FL_V_1 the generalisation that there will be no vowel unless the number and case are explicitly stated, but says that the singular nominative vowel is /o/. FL_V_1_II_II_IV has the same vowel for the plural genitive as FL_V_1 does for the singular nominative. FL_V_2_II_IV has the same vowel for the plural genitive as FL_V_2 has for the singular nominative. FL_V_3_II_IV specifies a stressed fleeting vowel in the plural genitive, which would not be stressed otherwise (i.e. because the noun belongs to a particular stress pattern). FL_V_4_II_II_IV declares a stressed /o/ to be inserted in the plural genitive. Finally, nouns such as l’ubov’ 'love' (sg nom) have a fleeting vowel in the singular nominative and singular instrumental.

FL_V_1:
<> ==
<sg nom> == \^e.

FL_V_2:
<> == FL_V_1
<sg nom> == \^o.

FL_V_1_II_II_IV:
<> ==
<pl gen> == FL_V_1:<sg nom>.

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This is the pronouns lexicon which is used with theory A (rusnoms6.dtr),
theory B (rusnoms7.dtr) and the modified version of theory B
(rusnoms8.dtr).

% The node On [sections 5.1, 5.8, 6.8 and 6.9] %
% This lexical entry generalises over all occurrences of the third person
% pronoun, which explains why we have glossed it as he/she/it. The
% declensional class follows that of A_II adjectives, such as mam'in
% 'mother's'. The usual form of the root is j-. We have specified that
% the singular nominative stem is on- and that the plural nominative
% is the same as the singular nominative, but with softening.
% *The path <mor vowel sg> gives the vowel that crops up in the oblique
% cases of the singular, instead of the -o of adjectives.
% *The path <mor vowel sg prep> specifies that the vowel of the singular
% prepositional is the same as the usual singular vowel of A_II adjectives,
% namely -o. Note that this vowel does not crop up in the singular
% prepositional feminine, because this is realised by a referral
% to the singular dative feminine (see discussion in sections 5.8 and
% 6.9 of the adjectival syncretism).
% *The singular genitive feminine is specified as being the singular
% prepositional feminine plus stress -6.
% *The value for 'pronoun stress' is the same as the value for plural stress.
% As the pronouns are specified as having pattern C stress (stem in
% singular; ending in plural), this means that the value for 'pronoun
% stress' is stressed. Note that we cannot just use one of the ordinary
% stress patterns, because ending stress for them means stress on the
% first syllable of the ending. Pronoun stress means stress on the last
% syllable of the ending. If we used a stress pattern which had 'ending
% stress' in the singular, this would mean that the pronoun would be
% stressed on the first syllable of the ending, which is not the case.
% *The values for stress are to be found at the node STRESS_C.

On:
<> == PRONOUN
<gloss> == he_she_it
<declensional_class> == A_II:<mor>
<infl_root all> == j
<stem sg nom> == on
<stem pl nom> == <stem sg nom> θ'
<mor vowel sg> == \^ e
<mor vowel sg prep> == A_II
<mor sg gen fem> == "<mor sg prep fem>* \^ oθ"
<stress pronoun> == <stress pl>
<stress> == STRESS_C.

% The node NON_THIRD [sections 5.8, 6.3, 6.8 and 6.9] (see over)
% *The declensional class of non-third pronouns is by default N_II. This
% is because the first and second person pronouns have singular dative -e
and singular instrumental -oj(u).

*The plural morphology of non-third pronouns is obtained by referring to the node MOR_NOMINAL. Note that the theme vowel which crops up in the plural prepositional is the one inherited because the non-third pronouns belong to declension N_II, namely -a.

*The plural prepositional is the plural stem, theme vowel with plural stress and the formative -s.

*The singular genitive is obtained from N_I.

*The stress index is 2, which means that the first and second person are stressed on the endings in the singular and plural in the same way as other nouns and adjectives.

NON_THIRD:
<> == PRONOUN
<declensional_class> == N_II::<mor>
<mor pl> == MOR_NOMINAL
<mor pl prep> == "<stem pl>" "<mor theme_vowel>" "<stress pl>" ^s
<mor sg gen> == N_I
<index> == 2.

% The node Second_person [sections 5.8, 6.3, 6.8 and 6.9]
% This is a non-third pronoun and inherits from NON_THIRD. It is glossed as 'you'.
% Its person reference overrides the default specified at NOUN, namely third.
% The plural stem is v-.
% The singular nominative is ti.
% The singular stem is teb'-.
% The singular instrumental stem is tob-.

Second_person:
<> == NON_THIRD
<gloss> == you
<syn person> == second
<stem pl> == v
<mor sg nom> == ti
<stem sg> == teb'
<stem sg inst> == tob.

% The node Second_person [sections 5.8, 6.3, 6.8 and 6.9]
% This is a non-third pronoun and inherits from NON_THIRD. It is glossed as 'me-us'.
% Its person reference overrides the default specified at NOUN, namely third.
% The singular nominative stem is j-
% The singular genitive stem is men'-.
% The singular stem is mn-.
% The plural stem is n-.
% The plural nominative stem is m-.

First_person:
<> == NON_THIRD
<gloss> == me_us
<syn person> == first
<stem sg nom> == j
<stem sg gen> == men'
<stem sg> == mn
<stem pl> == n
<stem pl nom> == m.

#hide
NON_THIRD.
This appendix contains some sample lexical entries from the adjective lexicon rusalex6.dtr used by all three of the theories contained in the appendix, theory A (rusnoms6.dtr), theory B (rusnoms7.dtr), and the modified version of theory B (rusnoms8.dtr).

% The lexical entry Bordo
% This adjective is indeclinable, because it ends in a vowel.

Bordo:
<=> == ADJ
    <gloss> == claret coloured
    <infl_root all> == bordo" 
    <infl_root final> == vowel.

% The lexical entry Dorogoj
% This adjective is assigned to the default adjectival class, namely class A_I. It specifies index 2 (pattern B) stress, and therefore is ending stressed throughout. This means that it has the vowel -o in the singular nominative masculine. See the node ADJ_VOWEL in rusnoms6.dtr, rusnoms7.dtr and rusnoms8.dtr.

Dorogoj:
<=> == ADJ
    <gloss> == dear
    <infl_root all> == dorog
    <index> == 2.

% The lexical entry Novij
% This adjective is assigned default adjectival class A_I and default stress (i.e. stem stress).

Novij:
<=> == ADJ
    <gloss> == new
    <infl_root all> == nov.

% The lexical entry Mam' in
% This noun is assigned to class A_II in its lexical entry. This means that it will have the endings -a, -o and zero in the singular nominative, and -i in the plural nominative.

Mam'in:
<=> == ADJ
    <declensional_class> == A_II:<mor>
    <gloss> == mum's
    <infl_root all> == mam'in.

% The lexical entry Otcov
% This noun is assigned to class A_III in its lexical entry. This means that it will have the endings -a, -o and zero in the singular nominative, and -i in the plural nominative, and the singular genitive and singular dative (masculine and neuter) endings -a and -u.

Otcov:
<=> == ADJ
    <declensional_class> == A_III:<mor>
    <gloss> == father's
    <infl_root all> == otco<v>.
% The lexical entry Rib'ij
% This noun belongs to the same adjectival class as mam'in 'mother's'.
% However, there is also a fleeting vowel in the singular nominative
% masculine, which will have the same form as the vowel which occurs
% in the singular nominative masculine of A_I adjectives when they
% are not ending stressed.

Rib'ij:
<> == ADJ
<declensional_class> == A-II:<mor>
<gloss> == fish's
<infl_root all> == rib' <vowel> j
<vowel sg nom masc> == ADJ_VOWEL
<phon stem hardness> == soft.
This appendix contains a small sample of the noun lexical entries from the modified lexicon for rusnoms8.dtr. All three of the theories have been checked on the first 1500 nouns from Zasorina (1977).

% The node Bereg
% This noun belongs to class N_I. It will be assigned a second locative form, because it is inanimate, tangible, belongs to class N_I, is functionally monosyllabic and has an index 3.

Bereg:
<> == NOUN
  <declensional_class> == N_I:<mor>
  <gloss> == shore
  <infl_root all> == bereg
  <index> == 3.

% The node Brat
% All of the theories outlined in this thesis account for the accusative-genitive syncretism of animate nouns such as Brat. Note also that it has a -j augment in the plural (see the node JOT_PL in rusnoms6.dtr, rusnoms7.dtr and rusnoms8.dtr).

Brat:
<> == NOUN
  <infl_root all> == brat
  <gloss> == brother
  <stem pl> == JOT_PL
  <sem sex> == male
  <mor stem syllabic> == monosyllabic.

% The node Kost'
% This noun belongs to class N_III. In theory it could have a second locative form, because it is inanimate, denotes a body part, belongs to class N_III is monosyllabic and has index 2. It therefore has to be specified as not having a second locative form. There are seven other class III nouns in the first 1500 from Zasorina which behave in this way (see section 8.3).

Kost':
<> == NOUN
  <declensional_class> == N_III:<mor>
  <gloss> == bone
  <infl_root all> == kost'
  <phon stem hardness> == soft
  <sem tangibility> == body_part
  <mor sg prep loc> == PREP_LOC::<>
  <index> == 2.
% The node *Okno*
% Okno is a class IV noun. It has a fleeting vowel in the plural
% genitive (which is the function of FL_V2_II_IV::<>). Its stress
% index is 3 (pattern D stress).

Okno:
<> == NOUN
     <declensional_class> == N_IV:<mor>
     <gloss> == window
     <infl_root all> == ok FL_V_2_II_IV::<> _ n
     <index> == 3.

% The node *Ruka*
% This noun also denotes a body part. But this has no effect on the
% realisation of the second locative, as it belongs to a declension
% class which does not have a separate second locative form, namely
% class II. It has index 5 stress (pattern Bii stress).

Ruka:
<> == NOUN
     <declensional_class> == N_II:<mor>
     <gloss> == arm
     <infl_root all> == ruk
     <index> == 5
     <sem tangibility> == body_part.

% The node *Stol*
% This noun belongs to class I and has ending stress throughout, as
% index 2 means that it is pattern B stress.

Stol:
<> == NOUN
     <declensional_class> == N_I:<mor>
     <gloss> == table
     <infl_root all> == stol
     <index> == 2.
APPENDIX XV

These are the theorem dumps for the personal pronouns in appendix XII for all three of the theories outlined in this thesis (rusnoms6.dtr, rusnoms7.dtr and rusnoms8.dtr).

% Theorems for the third person pronoun
% The third person pronoun alters with regard to gender.
% As the third person pronoun is both an agreement target and an agreement controller it is important to show that it has the correct form as a target corresponding to the syntactic gender it has as a controller for a given context. Contexts one and two are the ones in which the third person pronoun refers to a male or female. Context three is the context in which the gender of the antecedent is important. It should be noted that the theory derives the <syn gender> corresponding to the appropriate context.
% For example, the singular accusative form in context1 is jev0 and the controller gender <syn gender context1> for this context is masculine. As an example for context three, the <syn gender context3> paths should be read in the following way:
% <syn gender context3 masc> = masc means 'in the context in which the antecedent is masculine the controller gender is masculine.'

On:<gloss> = he/she/it.
On:<mor sg nom masc> = on.
On:<mor sg nom fem> = on "a @".
On:<mor sg nom neut> = on ^o @".
On:<mor sg acc context1> = j ^ e ^ vo @".
On:<mor sg acc context2> = j ^ e ^ j ^ o@".
On:<mor sg acc context3 masc> = j ^ e ^ vo @".
On:<mor sg acc context3 fem> = j ^ e ^ j ^ o@".
On:<mor sg acc context3 neut> = j ^ e ^ vo @".
On:<mor sg gen masc> = j ^ e ^ vo @".
On:<mor sg gen fem> = j ^ e ^ j ^ o@".
On:<mor sg gen neut> = j ^ e ^ vo @".
On:<mor sg dat masc> = j ^ e ^ mu @".
On:<mor sg dat fem> = j ^ e ^ j.
On:<mor sg dat neut> = j ^ e ^ mu @".
On:<mor sg inst masc> = j ^ i ^ m.
On:<mor sg inst fem> = j ^ e ^ j ( u ).
On:<mor sg inst neut> = j ^ i ^ m.
On:<mor sg prep masc> = j ^ o ^ m.
On:<mor sg prep fem> = j ^ e ^ j.
On:<mor sg prep neut> = j ^ o ^ m.
On:<mor pl nom> = on @' ^ i @".
On:<mor pl acc> = j ^ i @' ^ x.
On:<mor pl gen> = j ^ i @' ^ x.
On:<mor pl dat> = j ^ i @' ^ m.
On:<mor pl inst> = j ^ i @" ^ m'i.
On:<mor pl prep> = j ^ i @" ^ x.
On:<syn gender context1> = masc.
On:<syn gender context2> = fem.
On:<syn gender context3 masc> = masc.
On:<syn gender context3 fem> = fem.
On:<syn gender context3 neut> = neut.
% Second person pronoun
% In section 4.5 in our discussion of the Overextended Ancestor
% Prohibition we argued that first and second person pronouns
% behave like nouns in terms of their morphology, as they do not
% specify gender. Here the realisation of feature structures
% containing gender features is the result of using the same queries
% as for third person pronouns. Of course, the morphology does not
% specify gender features. It does, however, provide an answer
% containing a gender feature, if the syntax requires one. This
% follows from our arguments about attribute ordering, as gender
% extends the number and case paths, which are specified by the
% morphology. It is clear that we require contexts one and two,
% where the speaker may be male or female. The status of context
% three is uncertain here. It crucially depends on data about
% animates that are not sex-differentiable, but which may be assigned
% gender according to inflectional class. If they are personified in
% stories and use the first person for themselves and second person
% to address comrades, it may be the case that the gender assigned
% to them can only be the formal gender assigned to the nouns which
% are their denotata, especially if they remain asexual.

Second_person:<gloss> = you.
Second_person:<mor sg nom masc> = ti.
Second_person:<mor sg nom fem> = ti.
Second_person:<mor sg nom neut> = ti.
Second_person:<mor sg acc context1> = teb' ^ a @".
Second_person:<mor sg acc context2> = teb' ^ a @".
Second_person:<mor sg acc context3 masc> = teb' ^ a @".
Second_person:<mor sg acc context3 fem> = teb' ^ a @".
Second_person:<mor sg acc context3 neut> = teb' ^ a @".
Second_person:<mor sg gen masc> = teb' ^ a @".
Second_person:<mor sg gen fem> = teb' ^ a @".
Second_person:<mor sg gen neut> = teb' ^ a @".
Second_person:<mor sg dat masc> = teb' ^ e @".
Second_person:<mor sg dat fem> = teb' ^ e @".
Second_person:<mor sg dat neut> = teb' ^ e @".
Second_person:<mor sg inst masc> = tob ^ o @" ^ j ( u ).
Second_person:<mor sg inst fem> = tob ^ o @" ^ j ( u ).
Second_person:<mor sg inst neut> = tob ^ o @" ^ j ( u ).
Second_person:<mor sg prep masc> = teb' ^ e @".
Second_person:<mor sg prep fem> = teb' ^ e @".
Second_person:<mor sg prep neut> = teb' ^ e @".
Second_person:<mor pl nom> = v ^ i @".
Second_person:<mor pl acc> = v ^ a @" ^ s.
Second_person:<mor pl gen> = v ^ a @" ^ s.
Second_person:<mor pl dat> = v ^ a @" ^ m.
Second_person:<mor pl inst> = v ^ a @" ^ m' i.
Second_person:<mor pl prep> = v ^ a @" ^ s.
Second_person:<syn gender context1> = masc.
Second_person:<syn gender context2> = fem.
Second_person:<syn gender context3 masc> = masc.
Second_person:<syn gender context3 fem> = fem.
Second_person:<syn gender context3 neut> = neut.

% First person pronoun
% See discussion of second person above.

First_person:<gloss> = me, us.
First_person:<mor sg nom masc> = j ^ a @".
First_person:<mor sg nom fem> = j ^ a @".
First_person:<mor sg nom neut> = j ^ a @".
First_person:<mor sg acc context1> = men' ^ a @".
First_person:<mor sg acc context2> = men' ^ a @".

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First_person:<mor sg acc context3 masc> = men' ^ a @".
First_person:<mor sg acc context3 fem> = men' ^ a @".
First_person:<mor sg acc context3 neut> = men' ^ a @".
First_person:<mor sg gen masc> = men' ^ a @".
First_person:<mor sg gen fem> = men' ^ a @".
First_person:<mor sg gen neut> = men' ^ a @".
First_person:<mor sg dat masc> = mn ^ e @".
First_person:<mor sg dat fem> = mn ^ e @".
First_person:<mor sg dat neut> = mn ^ e @".
First_person:<mor sg inst masc> = mn ^ o @" ^ j (u).
First_person:<mor sg inst fem> = mn ^ o @" ^ j (u).
First_person:<mor sg inst neut> = mn ^ o @" ^ j (u).
First_person:<mor sg prep masc> = mn ^ e @".
First_person:<mor sg prep fem> = mn ^ e @".
First_person:<mor sg prep neut> = mn ^ e @".
First_person:<mor pl nom> = m ^ i @".
First_person:<mor pl acc> = n ^ a @" ^ s.
First_person:<mor pl gen> = n ^ a @" ^ s.
First_person:<mor pl dat> = n ^ a @" ^ m.
First_person:<mor pl inst> = n ^ a @" ^ m'i.
First_person:<mor pl prep> = n ^ a @" ^ s.
First_person:<syn gender context1> = masc.
First_person:<syn gender context2> = fem.
First_person:<syn gender context3 masc> = masc.
First_person:<syn gender context3 fem> = fem.
First_person:<syn gender context3 neut> = neut.
APPENDIX XVI

These are sample theorem dumps for the adjectives in appendix XIII for all three of the theories outlined in this thesis (rusnoms6.dtr, rusnoms7.dtr and rusnoms8.dtr).

% Indeclinable adjective

Bordo:<gloss> = claret-coloured.
Bordo:<mor sg nom masc> = bordo@".
Bordo:<mor sg nom fem> = bordo@".
Bordo:<mor sg nom neut> = bordo@".
Bordo:<mor sg acc masc inanimate> = bordo@".
Bordo:<mor sg acc masc animate> = bordo@".
Bordo:<mor sg acc fem> = bordo@".
Bordo:<mor sg acc neut> = bordo@".
Bordo:<mor sg gen masc> = bordo@".
Bordo:<mor sg gen fem> = bordo@".
Bordo:<mor sg gen neut> = bordo@".
Bordo:<mor sg dat masc> = bordo@".
Bordo:<mor sg dat fem> = bordo@".
Bordo:<mor sg dat neut> = bordo@".
Bordo:<mor sg inst masc> = bordo@".
Bordo:<mor sg inst fem> = bordo@".
Bordo:<mor sg inst neut> = bordo@".
Bordo:<mor sg prep masc> = bordo@".
Bordo:<mor sg prep fem> = bordo@".
Bordo:<mor sg prep neut> = bordo@".
Bordo:<mor pl nom> = bordo@".
Bordo:<mor pl acc inanimate> = bordo@".
Bordo:<mor pl acc animate> = bordo@".
Bordo:<mor pl gen> = bordo@".
Bordo:<mor pl dat> = bordo@".
Bordo:<mor pl inst> = bordo@".
Bordo:<mor pl prep> = bordo@".

% Ending stressed class A_I adjective

Dorogoj:<gloss> = dear.
Dorogoj:<mor sg nom masc> = dorog ^o @^ j.
Dorogoj:<mor sg nom fem> = dorog ^ a @^ ja.
Dorogoj:<mor sg nom neut> = dorog ^ o @^ je.
Dorogoj:<mor sg acc masc inanimate> = dorog ^o @^ j.
Dorogoj:<mor sg acc masc animate> = dorog ^ o @^ vo.
Dorogoj:<mor sg acc fem> = dorog ^ u @^ ju.
Dorogoj:<mor sg acc neut> = dorog ^ o @^ je.
Dorogoj:<mor sg gen masc> = dorog ^ o @^ vo.
Dorogoj:<mor sg gen fem> = dorog ^ o @^ j.
Dorogoj:<mor sg gen neut> = dorog ^ o @^ vo.
Dorogoj:<mor sg dat masc> = dorog ^ o @^ mu.
Dorogoj:<mor sg dat fem> = dorog ^ o @^ j.
Dorogoj:<mor sg dat neut> = dorog ^ o @^ mu.
Dorogoj:<mor sg inst masc> = dorog ^ i @^ m.
Dorogoj:<mor sg inst fem> = dorog ^ o @^ j ( u ) .
Dorogoj:<mor sg inst neut> = dorog ^ i @^ m.
Dorogoj:<mor sg prep masc> = dorog ^ o @^ m.
Dorogoj:<mor sg prep fem> = dorog ^ o @^ j.
Dorogoj:<mor sg prep neut> = dorog ^ o @^ m.
Dorogoj:<mor pl nom> = dorog ^ i @^ je.
Dorogoj:<mor pl acc inanimate> = dorog ^ i @^ je.
Dorogoj:<mor pl acc animate> = dorog ^ i @^ x.
Dorogoj:<mor pl gen> = dorog ^ i @^ x.
Dorogoj: <mor pl dat> = dorog ^ i @^ m.  
Dorogoj: <mor pl inst> = dorog ^ i @^ m'i.  
Dorogoj: <mor pl prep> = dorog ^ i @^ x.

% Stem stressed class A_I adjective

Novij: <gloss> = new.  
Novij: <mor sg nom masc> = nov ^ i ^ j.  
Novij: <mor sg nom fem> = nov ^ a ^ ja.  
Novij: <mor sg nom neut> = nov ^ o ^ je.  
Novij: <mor sg acc masc inanimate> = nov ^ i ^ j.  
Novij: <mor sg acc masc animate> = nov ^ o ^ vo.  
Novij: <mor sg acc fem> = nov ^ u ^ ju.  
Novij: <mor sg acc neut> = nov ^ o ^ je.  
Novij: <mor sg gen masc> = nov ^ o ^ vo.  
Novij: <mor sg gen fem> = nov ^ o ^ j.  
Novij: <mor sg gen neut> = nov ^ o ^ vo.  
Novij: <mor sg dat masc> = nov ^ o ^ mu.  
Novij: <mor sg dat fem> = nov ^ o ^ j.  
Novij: <mor sg dat neut> = nov ^ o ^ mu.  
Novij: <mor sg inst masc> = nov ^ i ^ m.  
Novij: <mor sg inst fem> = nov ^ o ^ j ( u ).  
Novij: <mor sg inst neut> = nov ^ i ^ m.  
Novij: <mor sg prep masc> = nov ^ o ^ m.  
Novij: <mor sg prep fem> = nov ^ o ^ j.  
Novij: <mor sg prep neut> = nov ^ o ^ m.  
Novij: <mor pl nom> = nov ^ i ^ je.  
Novij: <mor pl acc inanimate> = nov ^ i ^ je.  
Novij: <mor pl acc animate> = nov ^ i ^ x.  
Novij: <mor pl gen> = nov ^ i ^ x.  
Novij: <mor pl dat> = nov ^ i ^ m.  
Novij: <mor pl inst> = nov ^ i ^ m'i.  
Novij: <mor pl prep> = nov ^ i ^ x.  

% Class A_I II adjective which is a possessive in -in

Mam'in: <gloss> = mum's.  
Mam'in: <mor sg nom masc> = mam'in.  
Mam'in: <mor sg nom fem> = mam'in ^ a.  
Mam'in: <mor sg nom neut> = mam'in ^ o.  
Mam'in: <mor sg acc masc inanimate> = mam'in.  
Mam'in: <mor sg acc masc animate> = mam'in ^ o ^ vo.  
Mam'in: <mor sg acc fem> = mam'in ^ u.  
Mam'in: <mor sg acc neut> = mam'in ^ o.  
Mam'in: <mor sg gen masc> = mam'in ^ o ^ vo.  
Mam'in: <mor sg gen fem> = mam'in ^ o ^ j.  
Mam'in: <mor sg gen neut> = mam'in ^ o ^ vo.  
Mam'in: <mor sg dat masc> = mam'in ^ o ^ mu.  
Mam'in: <mor sg dat fem> = mam'in ^ o ^ j.  
Mam'in: <mor sg dat neut> = mam'in ^ o ^ mu.  
Mam'in: <mor sg inst masc> = mam'in ^ i ^ m.  
Mam'in: <mor sg inst fem> = mam'in ^ o ^ j ( u ).  
Mam'in: <mor sg inst neut> = mam'in ^ i ^ m.  
Mam'in: <mor sg prep masc> = mam'in ^ o ^ m.  
Mam'in: <mor sg prep fem> = mam'in ^ o ^ j.  
Mam'in: <mor sg prep neut> = mam'in ^ o ^ m.  
Mam'in: <mor pl nom> = mam'in ^ i.  
Mam'in: <mor pl acc inanimate> = mam'in ^ i.  
Mam'in: <mor pl acc animate> = mam'in ^ i ^ x.  
Mam'in: <mor pl gen> = mam'in ^ i ^ x.  
Mam'in: <mor pl dat> = mam'in ^ i ^ m.  
Mam'in: <mor pl inst> = mam'in ^ i ^ m'i.  
Mam'in: <mor pl prep> = mam'in ^ i ^ x.
Class A_III adjective which is a possessive in -ov

Otcov:<gloss> = father's.
Otcov:<mor sg nom masc> = otco"v.
Otcov:<mor sg nom fem> = otco"v ^ a.
Otcov:<mor sg nom neut> = otco"v ^ o.
Otcov:<mor sg acc masc inanimate> = otco"v.
Otcov:<mor sg acc masc animate> = otco"v ^ a.
Otcov:<mor sg acc neut> = otco"v ^ u.
Otcov:<mor sg gen masc> = otco"v ^ a.
Otcov:<mor sg gen fem> = otco"v ^ o ^ j.
Otcov:<mor sg gen neut> = otco"v ^ a.
Otcov:<mor sg dat masc> = otco"v ^ u.
Otcov:<mor sg dat fem> = otco"v ^ o ^ j.
Otcov:<mor sg dat neut> = otco"v ^ u.
Otcov:<mor sg inst masc> = otco"v ^ i ^ m.
Otcov:<mor sg inst fem> = otco"v ^ u.
Otcov:<mor sg inst neut> = otco"v ^ i.
Otcov:<mor sg prep masc> = otco"v ^ o ^ j.
Otcov:<mor sg prep fem> = otco"v ^ o ^ m.
Otcov:<mor sg prep neut> = otco"v ^ o.
Otcov:<mor pl nom> = otco"v ^ i.
Otcov:<mor pl acc inanimate> = otco"v ^ i.
Otcov:<mor pl acc animate> = otco"v ^ i ^ x.
Otcov:<mor pl gen> = otco"v ^ i ^ x.
Otcov:<mor pl dat> = otco"v ^ i ^ m.
Otcov:<mor pl inst> = otco"v ^ i ^ m ^ j.
Otcov:<mor pl prep> = otco"v ^ i ^ x.

Class A_II adjective which is an 'animal possessive'

Rib'ij:<gloss> = fish's.
Rib'ij:<mor sg nom masc> = rib' ^ i ^ j.
Rib'ij:<mor sg nom fem> = rib' j ^ a.
Rib'ij:<mor sg nom neut> = rib' j ^ o.
Rib'ij:<mor sg acc masc inanimate> = rib' ^ i ^ j.
Rib'ij:<mor sg acc masc animate> = rib' j ^ o ^ vo.
Rib'ij:<mor sg acc fem> = rib' j ^ u.
Rib'ij:<mor sg acc neut> = rib' j ^ o.
Rib'ij:<mor sg gen masc> = rib' j ^ o ^ vo.
Rib'ij:<mor sg gen fem> = rib' j ^ o ^ j.
Rib'ij:<mor sg gen neut> = rib' j ^ o ^ vo.
Rib'ij:<mor sg dat masc> = rib' j ^ o ^ j.
Rib'ij:<mor sg dat fem> = rib' j ^ o ^ j.
Rib'ij:<mor sg dat neut> = rib' j ^ o ^ j.
Rib'ij:<mor sg inst masc> = rib' j ^ i ^ m.
Rib'ij:<mor sg inst fem> = rib' j ^ o ^ j ( u ).
Rib'ij:<mor sg inst neut> = rib' j ^ i ^ m.
Rib'ij:<mor sg prep masc> = rib' j ^ o ^ m.
Rib'ij:<mor sg prep fem> = rib' j ^ o ^ j.
Rib'ij:<mor sg prep neut> = rib' j ^ o ^ m.
Rib'ij:<mor pl nom> = rib' j ^ i.
Rib'ij:<mor pl acc inanimate> = rib' j ^ i.
Rib'ij:<mor pl acc animate> = rib' j ^ i ^ x.
Rib'ij:<mor pl gen> = rib' j ^ i ^ x.
Rib'ij:<mor pl dat> = rib' j ^ i ^ m.
Rib'ij:<mor pl inst> = rib' j ^ i ^ m ^ j.
Rib'ij:<mor pl prep> = rib' j ^ i ^ x.
APPENDIX XVII

This appendix contains the theorem dumps for the example noun entries in appendix XIV. All three of the theories in this thesis have been checked on the first 1500 most frequent nouns from Zasorina (1977). These theorems are a tiny sample of the theorem dumps derived from the modified version of theory B (rusnoms8.dtr). It should be noted that every noun, including those of class II and class IV (see Ruka and Okno) provides a value for the feature structure <mor sg prep loc> of the second locative. It is only in a few cases that that feature structure has a realisation separate from that of the feature structure <mor sg prep>.

% The noun Bereg
% This class I noun has a separate form for the second locative and % -á in the plural nominative.

Bereg:<gloss> = shore.
Bereg:<mor sg nom> = bereg.
Bereg:<mor sg acc> = bereg.
Bereg:<mor sg gen> = bereg ^ a.
Bereg:<mor sg dat> = bereg ^ u.
Bereg:<mor sg inst> = bereg ^ om.
Bereg:<mor sg prep> = bereg ^ e.
Bereg:<mor sg prep loc> = bereg ^ u @".
Bereg:<mor pl nom> = bereg ^ a @".
Bereg:<mor pl acc> = bereg ^ a @".
Bereg:<mor pl gen> = bereg ^ ov @".
Bereg:<mor pl dat> = bereg ^ a @" ^ m.
Bereg:<mor pl inst> = bereg ^ a @" ^ m'i.
Bereg:<mor pl prep> = bereg ^ a @" ^ x.
Bereg:<syn gender> = masc.
Bereg:<syn animacy> = inanimate.

% The noun Brat
% This has an additional -j augment in the plural. Note that % our theories all account for the accusative-genitive syncretism % in animates. This noun gives a realisation for the feature % structure <mor sg prep loc>, even though it can, as an animate % noun, never realise a separate second locative.

Brat:<gloss> = brother.
Brat:<mor sg nom> = brat.
Brat:<mor sg acc> = brat ^ a.
Brat:<mor sg gen> = brat ^ a.
Brat:<mor sg dat> = brat ^ u.
Brat:<mor sg inst> = brat ^ om.
Brat:<mor sg prep> = brat ^ e.
Brat:<mor sg prep loc> = brat ^ e.
Brat:<mor pl nom> = brat ^ j ^ a.
Brat:<mor pl acc> = brat ^ j ^ ov.
Brat:<mor pl gen> = brat ^ j ^ ov.
Brat:<mor pl dat> = brat ^ j ^ a ^ m.
Brat:<mor pl inst> = brat ^ j ^ a ^ m'i.
Brat:<mor pl prep> = brat ^ j ^ a ^ x.
Brat:<syn gender> = masc.
Brat:<syn animacy> = animate.
% The noun Kost'
% This noun could potentially have a second locative according to our
% theory, but does not (see the lexical entry in appendix XIV). Note
% that this noun also has pattern Ci stress.

Kost':<gloss> = bone.
Kost':<mor sg nom> = kost'.
Kost':<mor sg acc> = kost'.
Kost':<mor sg gen> = kost' i.
Kost':<mor sg dat> = kost' i.
Kost':<mor sg inst> = kost' ju.
Kost':<mor sg prep> = kost' i.
Kost':<mor sg prep loc> = kost' i.
Kost':<mor pl nom> = kost' i.
Kost':<mor pl acc> = kost' i.
Kost':<mor pl gen> = kost' ej o'.
Kost':<mor pl dat> = kost' a o' m.
Kost':<mor pl inst> = kost' a o' m' i.
Kost':<mor pl prep> = kost' a o' x.
Kost':<syn gender> = fem.
Kost':<syn animacy> = inanimate.

% The noun Okno
% This noun has pattern D stress and belongs to class IV. Note the
% fleeting vowel in the plural genitive. As there is no
% specification of the second locative at class N-IV, nouns of this
% class will specify a realisation that is the same as the
% ordinary singular prepositional.

Okno:<gloss> = window.
Okno:<mor sg nom> = ok _ n o o'.
Okno:<mor sg acc> = ok _ n o o'.
Okno:<mor sg gen> = ok _ n a o'.
Okno:<mor sg dat> = ok _ n u o'.
Okno:<mor sg inst> = ok _ n om o'.
Okno:<mor sg prep> = ok _ n e o'.
Okno:<mor sg prep loc> = ok _ n e o'.
Okno:<mor pl nom> = ok _ n a.
Okno:<mor pl acc> = ok _ n a.
Okno:<mor pl gen> = ok o _ n.
Okno:<mor pl dat> = ok _ n a m.
Okno:<mor pl inst> = ok _ n a m' i.
Okno:<mor pl prep> = ok _ n a x.
Okno:<syn gender> = neut.
Okno:<syn animacy> = inanimate.

% The noun Ruka
% This noun belongs to class II and has pattern Bii stress (on the
% ending, except in the plural nominative and singular accusative).
% Class II nouns also give a value for the feature structure
% <mor sg prep loc>, but there is never a value specified for N-II
% nouns. This means that the derivable theorem for any class II
% noun for the second locative will always be the same as the
% ordinary prepositional.

Ruka:<gloss> = arm.
Ruka:<mor sg nom> = ruk ^ a o'.
Ruka:<mor sg acc> = ruk ^ u.
Ruka:<mor sg gen> = ruk ^ i o'.
Ruka:<mor sg dat> = ruk ^ e o'.
Ruka:<mor sg inst> = ruk ^ o o' j ( u )
Ruka:<mor sg prep> = ruk ^ e o'.
Ruka:<mor sg prep loc> = ruk ^ e o'.
Ruka: <mor pl nom> = ruk ^ i.
Ruka: <mor pl acc> = ruk ^ i.
Ruka: <mor pl gen> = ruk @".
Ruka: <mor pl dat> = ruk ^ a @" ^ m.
Ruka: <mor pl inst> = ruk ^ a @" ^ m'i.
Ruka: <mor pl prep> = ruk ^ a @" ^ x.
Ruka: <syn gender> = fem.
Ruka: <syn animacy> = inanimate.

% The noun Stol
% This noun has pattern B stress and belongs to class I.

Stol: <gloss> = table.
Stol: <mor sg nom> = stol @".
Stol: <mor sg acc> = stol @".
Stol: <mor sg gen> = stol ^ a @".
Stol: <mor sg dat> = stol ^ u @".
Stol: <mor sg inst> = stol ^ om @".
Stol: <mor sg prep> = stol ^ e @".
Stol: <mor sg prep loc> = stol ^ e @".
Stol: <mor pl nom> = stol ^ i @".
Stol: <mor pl acc> = stol ^ i @".
Stol: <mor pl gen> = stol ^ ov @".
Stol: <mor pl dat> = stol ^ a @" ^ m.
Stol: <mor pl inst> = stol ^ a @" ^ m'i.
Stol: <mor pl prep> = stol ^ a @" ^ x.
Stol: <syn gender> = masc.
Stol: <syn animacy> = inanimate.