ABSTRACT OF THE DISSERTATION

Faithful Stress in Paradigms: Nominal Inflection in Ukrainian and Russian

by LUBA BUTSKA

Dissertation Director:

Hubert Truckenbrodt

This dissertation is the first English-language description and analysis of Ukrainian inflectional stress in nouns. The analysis also offers a new way to capture the generalizations of stress in Russian nouns. Ukrainian and Russian nominal inflectional stress patterns fall into three main divisions: Fixed stress; Post-stem stress; and Mobile stress.

Fixed stress surfaces on the same stem syllable throughout the entire inflectional paradigm; these stems are specified for stress in the input. I propose a new analysis for Post-stem stressing nouns in terms of faithfulness: these stems are faithful to an absence of stem stress in the input. The characterization of certain stems as lexically marked for stress, and others as not inherently stressed, is one which has a long history in the generative accounts for Russian (cf. Brown et. al. 1996, Halle 1973, 1997, Halle and Idsardi 1995, Idsardi 1992, Melvold 1986, 1990, Stankiewicz 1986, 1993). But whereas accounts of Russian usually specify a special rule or constraint requiring stress to arise on
Post-stem syllable, the proposal here is that faithfulness to that lack of stem stress drives the Post-stem pattern.

Mobile stress is the final pattern in Ukrainian and Russian nominal inflection. I maintain the two-way distinction of underlying stress (i.e. presence and absence) by looking carefully at the whole paradigm of a Ukrainian nominal stem. I show that a particular member of the paradigm always triggers Mobile stress, and that Mobile stems therefore need not be specially marked in Ukrainian, as they have been in Russian.

The Mobile inflected forms are related by OO correspondence: a privileged base affects derivative forms in the same sub-paradigm. Thus I extend base priority to inflectional paradigms. The argument here rests on the priority of a defined base form, rather than the structure of the inflectional paradigm as part of knowledge of the grammar of Ukrainian or Russian. The base-derivative relationship I propose for inflectional paradigms allows us to capture the generalization that Mobile stress always occurs when there is a base form in the sub-paradigm showing stem stress, a generalization missed by previous accounts of Russian nominal inflection.
Chapter 1

Introduction and Overview

1.1 Stress Patterns: Introduction

In Ukrainian nominal inflectional paradigms, stress always falls either on the stem or on the inflectional suffix in one of the three main patterns outlined below:

(1) Ukrainian stress
1. Fixed stress: stress is on a particular syllable of the stem in all forms
2. Post-stem stress: stress is on the inflectional ending (when present) in all forms
3. Mobile stress: stress shifts between stem and inflection so that stress is either
   (a) on inflectional endings in singular, and on the stem in plural, or
   (b) on the stem in singular, and on inflectional endings in plural.

The Fixed stress group is the largest; it is comprised of the majority of the stems in Ukrainian. The Post-stem and Mobile stems receive most of the attention here, as they do in accounts for Russian, since they are the most complex patterns. A representative example of each Ukrainian stress pattern showing nominative singular and nominative plural forms is shown in the table below. Note the short forms for the types of stress in the first column, and the number of stems for each non-fixed pattern. (Examples for each group, and an exhaustive list of all Mobile stems is given in the “Database” section at the end of this dissertation).

---

1 I use the term ‘stress’ here in order to follow most other accounts for Russian (cf. “References” section. For example, Halle 1997 writes: “A stressed element…is one that is phonetically more prominent than other elements in the word.” The term “accent”, according to Halle, can apply only to elements supplied with stress in the lexicon, e.g. stems with Fixed stress.)
(2) Ukrainian Stress patterns, examples

<table>
<thead>
<tr>
<th>TYPE</th>
<th>STEM</th>
<th>NOM SG</th>
<th>NOM PL</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>F (Fixed)</td>
<td>/derzâv/</td>
<td>derzâv-a</td>
<td>derzâv-y²</td>
<td>‘government’</td>
</tr>
<tr>
<td>P (Post-stem): 296</td>
<td>/fiarbus/</td>
<td>fiarbúz</td>
<td>/fiarbus/-ý</td>
<td>‘pumpkin’</td>
</tr>
<tr>
<td>M (Mobile): 426 total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Sg. inflectional stress M1 &amp; M2: 203</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i) M1: 171 (pl. final stem stress)</td>
<td>/kovbas/</td>
<td>kovbas-á</td>
<td>kovbás-y</td>
<td>‘sausage’</td>
</tr>
<tr>
<td>(ii) M2: 32 (pl: initial stem stress)</td>
<td>/fiolov/</td>
<td>fiolov-á</td>
<td>fiólov-y</td>
<td>‘head’</td>
</tr>
<tr>
<td>(b) Sg. stem stress M3: 223 (pl. inflectional stress)</td>
<td>/vik/</td>
<td>vik</td>
<td>vik-ý</td>
<td>‘age’</td>
</tr>
</tbody>
</table>

The second column shows the input form of the stem, shown with slanted lines; note that only the Fixed form shows underlying inherent stem stress. The Post-stem and Mobile stems are inherently unstressed with no stress mark on the underlying stem. Stress appears on all surface forms in the third and fourth columns, which show surface nominative singular and nominative plural forms respectively for each stem.

Mobile stress is divided into three groups according to whether stress is on the stem or on the inflectional ending. Where stress is on the inflection in the singular, there is a

---

2 Transcriptions given in the thesis are phonemic, with some phonetic illustration of variation within a paradigm, eg. palatalization in later examples. Note the symbol [ʃ], a voiced laryngeal. Note also that the vowel [y] is an unstable vowel in Ukrainian, also realized as [ý] and unrounded [i] and [ɛ] depending on the environment and the dialect. I use [y] after Shevelov 1979 Zîlyns’kyj 1979, and to distinguish this vowel from [-i], another nominative plural suffix. (cf. Appendix 1 for a vowel chart of Ukrainian.)
distinction between right edge stem stress M1 and left edge stem stress M2 in the plural. M3 shows stress on the stem in the singular and inflectional stress in the plural. There is no distinction between stem edges for M3 because this group of stems is monosyllabic. (The group of M3 stems comprises all of the monosyllabic non-fixed stems; that is, there are no monosyllabic P stems. See section 3.3 for details.)

A graphic representation of each pattern is given in (3); divisions between stem and inflectional ending are represented by a dash. (Both stem and inflectional ending represented here with a syllable, although multi-syllables for both are possible, as we will see.)

<table>
<thead>
<tr>
<th>(3) Stress patterns</th>
<th>Singular</th>
<th>Plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fixed</td>
<td>σ - σ</td>
<td>σ' - σ</td>
</tr>
<tr>
<td>2. Post-Stem</td>
<td>σ - σ'</td>
<td>σ - σ'</td>
</tr>
<tr>
<td>3. Mobile (a)</td>
<td>σ - σ'</td>
<td>σ - σ'</td>
</tr>
<tr>
<td>(b)</td>
<td>σ - σ</td>
<td>σ - σ'</td>
</tr>
</tbody>
</table>

The contrast between stem stress and inflectional stress shown in (3) and (2) is central to East Slavic stress. In all three East Slavic languages, Ukrainian, Russian, and Belorusian, words are most often overtly inflected; stems are usually not realized alone, but surface with inflectional affixes. Nouns are usually realized with number, case and gender suffixes, and verbs are inflected with person and number suffixes and tense suffixes and prefixes.
(2) illustrates an important difference between nominal stems in Ukrainian: some stems take inflectional endings for certain cases like the nominative singular [derz̄áv-a], while other stems, like [fiarbúz], do not for the same case. (Note that since Ukrainian stems always end in a consonant, surface forms without an inflectional ending, like [fiarbúz], also always end in a consonant.) Forms without overt inflection arise relatively infrequently compared to inflected forms, but they appear with striking regularity in Post-Stem and Mobile stress paradigms.

The focus in this chapter is a data summary which highlights these uninflected forms in a paradigm. Their identification will be a crucial part of the analysis in Chapters 3 and 4; Section 1.2 is a preview of the way in which these forms are important for the analysis.

1.2 PREVIEW OF ANALYSIS

The different patterns of stress cannot be predicted by surface phonological principles alone. For example, Ukrainian contrasts a Fixed stress stem like /kúlyk/ ‘sheaf’ with Post-stem stress in the stem /kulyk/ ‘wood-grouse’. The chart in (4) shows nominative and genitive cases for singular and plural forms of both stems to illustrate the contrast:
(4) Fixed vs. Post-stem stress

<table>
<thead>
<tr>
<th></th>
<th>Fixed: /kúlyk/ ‘sheaf’</th>
<th>Post-stem: /kulyk/ ‘grouse’</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOM</td>
<td>kúlyk</td>
<td>kulyk</td>
</tr>
<tr>
<td>SG</td>
<td>kúlyk</td>
<td>kulyk-ý</td>
</tr>
<tr>
<td>PL</td>
<td>kúlyk-ý</td>
<td>kulyk-ý</td>
</tr>
<tr>
<td>GEN</td>
<td>kúlyk-a</td>
<td>kulyk-á</td>
</tr>
<tr>
<td></td>
<td>kúlyk-ív</td>
<td>kulyk-ív</td>
</tr>
</tbody>
</table>

The stems /kúlyk/ and /kulyk/ are identical in terms of segmental phonological characteristics, and both have the same inflectional endings. There is no surface-based characteristic which explains why one noun has Fixed stress, and the other has Post-stem stress.

I follow recent accounts of Russian (cf. Idsardi 1992, Halle 1997, Alderete 1999, Revithiadou 1999, and others) in assuming that some stems are underlyingly specified for stress while others are not. Therefore, /kúlyk/ is shown with stress lexically specified on the stem; this distinguishes /kúlyk/ ‘sheaf’ from /kulyk/ ‘wood grouse’, with no inherent stress. To explain how stress arises consistently on the inflectional ending in Post-stem stressing stems, most Russian analyses posit a special Post-stem stressing rule (for examples of rules, cf. Halle 1973, 1975, 1997; cf. Alderete 1999 and Revithiadou 1999 for OT constraints.)

This work differs from other analyses for Russian by proposing that faithfulness to an absence of stem stress ensures that Post-stem stress is assigned to inflectional endings,
and not to the stem for stems like /kulyk/. The lack of stem stress must be maintained, and so the inflectional ending is stressed instead. The details of the analysis of these Post-stem stressing nouns follows in Chapter 2, where I make the first major claim of this dissertation: that faithfulness to an absence of stress, assured by the constraint DEP-STRESSSTEM, explains Post-stem stress in Eastern Slavic.

The second major claim of this dissertation is that in inflectional paradigms, a form without overt inflection can act as a Base for OO Faithfulness and so influence other related forms to follow suit in terms of stem stress. We see this in the nominal paradigms of Ukrainian; specifically, in the analysis of the third class of stems, Mobile stems. Mobile stems contrast with Fixed stress stems in Ukrainian, as in the two forms in (5):

(5) Fixed vs. Mobile Stress: klub (2nd declension)³

<table>
<thead>
<tr>
<th></th>
<th>Fixed</th>
<th>Mobile</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>/klùb/</td>
<td>/klub/</td>
</tr>
<tr>
<td>Sg</td>
<td>‘haunch’</td>
<td>‘whirl’</td>
</tr>
<tr>
<td>Pl</td>
<td>klùb-y</td>
<td>klub-ý</td>
</tr>
<tr>
<td>Nom.</td>
<td>klùb</td>
<td>klùb</td>
</tr>
<tr>
<td>Gen.</td>
<td>klùb-a</td>
<td>klub-a</td>
</tr>
<tr>
<td></td>
<td>klùb-iv</td>
<td>klub-ív</td>
</tr>
</tbody>
</table>

Like the stems in (4), the two stems above are identical in terms of segmental phonological and morphological characteristics but have different stress patterns³. The

³ Another fixed stress form /klùb/ ‘club’ is not compared because of the different gen. sg. ending: [klùb-u].
paradigm for ‘haunch’ maintains Fixed stress throughout, but ‘whirl’ shows Mobile stress: plural inflectional stress contrasts with stem stress in the singular.

I propose that the Mobile stems in Ukrainian are also unspecified for stress underlyingly, just like Post-stem stressing stems. This differs from most accounts for Russian which specify Mobile stems for a third type of stress underlyingly (c.f. for example, Idsardi 1992, Halle 1997, Revithiadou 1999)⁴. Without a three-way distinction underlyingly for stress, it is not immediately clear why Mobile nouns are different from Post-stem nouns in Ukrainian, since both lack inherent stress. I show in Chapter 3 that surface characteristics of the Mobile and Post-stem nouns in Ukrainian determine whether the stress falls on inflectional endings wherever possible, as for Post-stem /kulyk/, or on the stem in part of the paradigm as in the case of Mobile /klub/.

As we saw in section 1.1, the main problem the Ukrainian data presents us with is how to distinguish the different types of stress, given that no surface phonological characteristic helps us predict when a stem has or does not have Fixed lexical stress. The analysis in the chapters that follow shows the two main predictors of nominal stress: a) the input specification of stress or lack thereof and b) whether there is a form in the paradigm without overt affixation.

⁴ Alderete 1999 is an exception, and assumes a two-way stress distinction as I do here; but he does not account for the M2 pattern in Ukrainian; see Chapter 4 for details.
1.3 Data: Ukrainian nominal declensions

Declension classes in Ukrainian divide nouns according to gender (an arbitrary distinction), with feminine nouns showing a further division according to the type of inflectional ending. Membership in a traditional declension class in Ukrainian depends in part on the types of inflectional endings that a particular stem has, although there is variation in inflectional endings within each declension. To set the stage for an analysis based on the different types of endings within a stem’s paradigm, I give details of the Ukrainian stress patterns with respect to traditional declension classes, with examples of stress patterns for each class.

1.3.1 Why declensions?

The type of stress in this analysis will depend on whether there is a form within the paradigm which does not show overt affixation. Declension type in Ukrainian divides nouns according to gender and the kinds of endings a stem takes. A declension class defines a set of very similar paradigms which is helpful for the analysis of stress presented here: the classes are in large part distinguished by whether the nominative singular, or the genitive plural, has a zero ending. The three main declension types and their nominative singular and genitive plural endings are summarized below:

---

5 There are a few exceptions which show different endings, cf. Bilodid 1969, but these are not relevant to our analysis, since all are Fixed stressed stems.
(6) Stress declension type

<table>
<thead>
<tr>
<th>Declension</th>
<th>Gender</th>
<th>Nom. Sg. ending</th>
<th>Gen. Pl. ending</th>
</tr>
</thead>
<tbody>
<tr>
<td>1\textsuperscript{st}</td>
<td>Fem. and Masc.</td>
<td>-\textit{a} inflectional ending</td>
<td>-∅</td>
</tr>
<tr>
<td>2\textsuperscript{nd}</td>
<td>Masc.</td>
<td>-∅</td>
<td>-\textit{iv}</td>
</tr>
<tr>
<td>Neuter</td>
<td>-\textit{o} or -\textit{e}</td>
<td>-∅</td>
<td></td>
</tr>
<tr>
<td>3\textsuperscript{rd}</td>
<td>Fem.</td>
<td>-∅</td>
<td>-\textit{ej}</td>
</tr>
</tbody>
</table>

Where a zero ending is found in the paradigm determines the kind of Mobile stress, and in part whether the stem is Mobile or Post-stem stressing. Since declension classes (and gender in 2\textsuperscript{nd} declension) also separate stems according to where a zero ending in the set arises, I point out the relation of declensions to certain stress patterns below. This summary is based largely on Bilodid 1969, whose volume ‘Morphology’ is a foremost source for descriptions of the different Ukrainian declensions.

The connection between certain declension types and stress in East Slavic has been noted (c.f. especially Brown et.al. 1996, Halle 1973 on Russian). For example, Halle 1973 writes that Russian a-stems, i.e. 1\textsuperscript{st} declension stems, show mobile stress. Brown et. al. 1996 show correspondences between declension type and stress patterns: different declensions prefer different stress patterns. However, these proposals do not mention specific paradigmatic characteristics, nor do they show the full paradigms with all forms for the stems in question.
The sections below show the full paradigms for different declension classes and highlight how different types of stress can be predicted from the differences between the stems and the endings they receive in different case and number forms. I present the Ukrainian data according to declension types as they appear in Ukrainian grammars. This is a type of presentation which will be familiar to Slavicists but perhaps not as familiar to others; most of these divisions of noun classes are historically based, and not based on the type of stress exhibited by the noun.

1.3.2 Declensions: Overview

As noted in the previous section, divisions into declension class are based in large part on the gender of nouns. There are four declensions in Ukrainian; we will focus on the first three here.

1st declension is made up of most feminine (and some masculine) stems; these stems are called ‘a-stems’ in the Ukrainian (and Russian) literature because they show the suffix [-a] in the nominative singular. (Note that the ‘a-stem’ does not mean the stem itself ends in [a], but is followed by [a] in the nom. sg.).

2nd declension is comprised of most masculine and neuter stems. (Some masculine and neuter stems are in 1st and 4th declensions). These stems show different endings depending on gender; thus I divide 2nd declension accordingly into masculine and neuter stems. Masculine stems consistently end in a stem-final consonant in the nominative singular; i.e. there is no nominative singular inflection. Neuter stems usually end in an [–o] or [–e] suffix in the nominative singular.
3\textsuperscript{rd} declension nouns also end in a stem-final consonant in the nominative singular, but these stems are feminine. Thus although Ukrainian feminine stems most often end in the [-a] vowel of 1\textsuperscript{st} declension stems, some do not have overt affixation in the nominative singular, and are separately classified as 3\textsuperscript{rd} declension stems.

4\textsuperscript{th} declension has the fewest nouns, with two very specific inflected forms within their paradigms: those with diminutive suffix –\textit{at} and those showing the suffix –\textit{en}. Some grammars (e.g. Humesky 1989) include only the first three declensions because of the relative paucity of 4\textsuperscript{th} declension stems. I summarize the properties of the 4\textsuperscript{th} declension only briefly in this section, and leave them aside for the purposes of the analysis.

All these declensions show various types of stress. One common characteristic is that each group is comprised at least in part by nouns with Fixed stem stress. Since each declension includes Fixed stress nouns, there is no way to characterize the stress patterns exclusively by declension. In the following sections, I show that once Fixed stems are separated from other stems by inherent stress, the types of non-Fixed stress can be limited to certain declension types.

1.3.3 Stress in 1\textsuperscript{st} declension nouns
Most 1\textsuperscript{st} declension nouns are feminine; the masculine members of the 1\textsuperscript{st} declension are rare, and are usually proper names. 1\textsuperscript{st} declension is traditionally labeled “\textit{a}-stem”
because the stem takes an [-a] suffix in the nominative singular form. A typical 1st
declension feminine noun showing Fixed stress is in (7) below:

(7) 1st declension: Fixed stress
/osnov/ ‘base’

<table>
<thead>
<tr>
<th>Case</th>
<th>Singular</th>
<th>Plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominative</td>
<td>osnóv-a</td>
<td>osnóv-y</td>
</tr>
<tr>
<td>Genitive</td>
<td>osnóv-y</td>
<td>osnóv</td>
</tr>
<tr>
<td>Dative</td>
<td>osnóv-i</td>
<td>osnóv-am</td>
</tr>
<tr>
<td>Accusative</td>
<td>osnóv-u</td>
<td>osnóv-y</td>
</tr>
<tr>
<td>Instrumental</td>
<td>osnóv-oju</td>
<td>osnóv-amy</td>
</tr>
<tr>
<td>Locative</td>
<td>osnóv-i</td>
<td>osnóv-ax</td>
</tr>
<tr>
<td>Vocative</td>
<td>osnóv-o</td>
<td>osnóv-y</td>
</tr>
</tbody>
</table>

Note that all the case forms for the singular and plural paradigm in (7) show stress on the
same stem vowel; thus stress is Fixed throughout the paradigm. We represent Fixed stress
with input stress on the stem vowel: /osnóv/. The stem remains faithful to this underlying
stress throughout its paradigm.

In addition to the Fixed stress pattern, 1st declension stems show the Mobile stress
patterns M1 and M2, where stress is on the inflection in the singular and on the stem in
the plural. These stems are characterized in part by a lack of underlying stress (in contrast
to the Fixed stress example above). In addition, I claim that Mobile M1 and M2 stems
show stem stress in the plural part of the paradigm because they have an uninflected zero
form in this paradigm. Below I consider each Mobile pattern in turn.
In the M1 pattern stress is on the inflectional ending in the singular, and on the stem-final vowel throughout the plural paradigm\(^7\):

\[(8) \text{1st declension: M1} \]
\[/kovbas/ 'sausage'

<table>
<thead>
<tr>
<th>Nom.</th>
<th>Singular</th>
<th>Plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>kovbas-á</td>
<td>kovbás-y</td>
<td></td>
</tr>
<tr>
<td>kovbas-ý</td>
<td>kovbás</td>
<td></td>
</tr>
<tr>
<td>Dat.</td>
<td>kovbas-í</td>
<td>kovbás-am</td>
</tr>
<tr>
<td>kovbas-ú</td>
<td>kovbás-y</td>
<td></td>
</tr>
<tr>
<td>Inst.</td>
<td>kovbas-óju</td>
<td>kovbás-amy</td>
</tr>
<tr>
<td>Loc.</td>
<td>kovbas-í</td>
<td>kovbás-ax</td>
</tr>
<tr>
<td>Voc.</td>
<td>kovbas-ó</td>
<td>kovbás-y</td>
</tr>
</tbody>
</table>

The singular cases show stress on the inflectional endings throughout the singular sub-paradigm, as a Post-stem stressing stem would. But the plural forms show stress on the stem, unlike P stems. I argue that this is because the plural paradigm has a form without overt inflection. The unaffixed form in this plural sub-paradigm is the genitive plural; this form necessarily requires stem stress since there is no inflectional ending which can bear stress. The genitive plural affects stress realization in the rest of the plural paradigm. A descriptive generalization which holds for these plural forms is that the plural regularizes its stress to be in the same position as stress in the genitive, which is necessarily stem stressed. The analysis in Chapter 3 provides a formal account of this statement.

---

\(^6\) The nominative and vocative plural forms are not distinct.

\(^7\) This particular example is based on Bilodid 1969; Holovashchuk 1995 also gives the same form with instability within the paradigm, of the type discussed in section 1.4.2 and in more detail in Chapter 4.
The M2 group of mobile stems is, like M1, comprised exclusively of 1st declension stems, which have an uninflected genitive plural form. Like M1, M2 also shifts between stem and inflectional stress. However, the stem stress is not stem-final, as it is in M1 stems. M2 is the Mobile pattern of stress where singular inflectional stress varies with plural stem-initial stress, as in /holov/ (head) below:

(9) 1st declension: M2

<table>
<thead>
<tr>
<th>Nom. inflection</th>
<th>Plural stem-initial</th>
</tr>
</thead>
<tbody>
<tr>
<td>fiolov-á</td>
<td>fiolov-y</td>
</tr>
<tr>
<td>fiolov-ý</td>
<td>fioliv</td>
</tr>
<tr>
<td>fiolov-i</td>
<td>fiolov-am</td>
</tr>
<tr>
<td>fiolov-u</td>
<td>fiolov-y</td>
</tr>
<tr>
<td>fiolov-óju</td>
<td>fiolov-amy</td>
</tr>
<tr>
<td>fiolov-i</td>
<td>fiolov-ax</td>
</tr>
<tr>
<td>fiolov-o</td>
<td>fiolov-y</td>
</tr>
</tbody>
</table>

The singular cases show stress on the inflectional endings throughout most of the singular sub-paradigm. (The accusative and vocative singular pattern with the plural for some M2 stems including /fiolov/; see Chapter 4 for details.) The plural forms show stress on the stem. As for M1, the plural sub-paradigm shows stem stress because, I claim, there is a form in the plural that lacks overt inflection. Note that unlike M1, the genitive plural does not pattern with the rest of the plural paradigm. Here, stress is stem-final for the genitive plural, but stem-initial for the nominative plural. In the analysis, we will pay particular attention to the form of the base; specifically the nature of the base vowel, which shifts from [o] to [i] in the genitive plural form. For all of the stems which show Mobile pattern M2, the final vowel in the genitive plural is always different from the other forms. This
fact correlates with the observation that the stem-final vowel in the genitive plural does not show the same stress as the rest of the plural paradigm. Details of the differences between M1 and M2 type stress are discussed in Chapter 4.

All 1st declension stems are characterized by a lack of overt plural inflection in one member of the plural sub-paradigm. If stems are Fixed stems, they are inherently marked for stress and the lack of plural inflection has no influence on stress. But 1st declension stems that are unspecified for stress are affected by the form which lacks overt inflection in the plural paradigm; these stems show Mobile stress. The type of stress for a 1st declension stem, whether stress is F or M, depends on the presence or absence of lexical stress.

1.3.4 Stress in 2nd declension nouns

The second declension is comprised of masculine and neuter nouns; the different genders show different stress patterns, so I show the non-fixed patterns of neuter nouns separately below. Both the masculine and neuter group of nouns, like first declension, share the characteristic of having members with Fixed stress, like /xlópts/8 ‘boy’:

---

8 The ‘ symbol shows palatal consonants, which have no effect on stress.
The example above is a masculine 2\textsuperscript{nd} declension stem which shows Fixed stress; the stem /xlópts/ is inherently stressed. Just like 1\textsuperscript{st} declension nouns, 2\textsuperscript{nd} declension nouns can be divided into two groups: those with and those without inherent stress. The sections below show the non-fixed pattern for the neuter and masculine divisions of 2\textsuperscript{nd} declension, where stem stress is not inherent.

1.3.4.1 Stress in 2\textsuperscript{nd} Declension Neuter nouns

Neuter 2\textsuperscript{nd} declension stems, like the 1\textsuperscript{st} declension stems, show a zero form in the plural paradigm. These neuter stems also show the Mobile stress pattern, with stem stress varying with inflectional stress. Since there are no vowel quality shifts in 2\textsuperscript{nd} declension plural stems, the Mobile pattern which arises is M1. Below I show multisyllabic and monosyllabic examples:
Typical of an inherently unspecified stem, the singular in both the multisyllabic example in (11) and the monosyllabic example in (12) shows inflectional stress; the plural shows stem stress, with stress in the same position as in the uninflected genitive plural form.

The analysis in Chapter 3 and 4 predicts the examples above in the same way it predicts 1st declension stems: the uninflected form in the plural paradigm triggers stem stress throughout the plural sub-paradigm.

---

9 It is not immediately clear that (12) is an M1 stem, since it has only one syllable. Because M2 stems have the distinguishing characteristic of vowel change within the stem, I assume only monosyllabic stems showing the vowel change are M2. Monosyllabic stems with no change, like (12), are M1.
There is a final group of 2\textsuperscript{nd} declension neuter nouns where singular stem stress varies with plural base-affected stress, and which I consider exceptional; see section 1.4.1 of this chapter for an example.

1.3.4.2 Stress in 2\textsuperscript{nd} declension Masculine nouns

Whereas the zero ending in the plural paradigm characterizes the examples so far, the masculine 2\textsuperscript{nd} declension stems do not have a zero plural form. Instead, all plural forms have overt inflection as in (13) below. Thus we predict a different type of non-fixed stress pattern if stress depends on paradigmatic characteristics. This is borne out; the most common type of non-Fixed pattern for masculine 2\textsuperscript{nd} declension nouns is not Mobile stress, but Post-stem stress as below, with stress on the inflectional ending where there is one throughout the paradigm:

(13) 2\textsuperscript{nd} declension masculine: P-stress

\begin{tabular}{|c|c|}
\hline
Nom. & Sg & Pl \\
\hline
fiarbúz & fiarbuz-ý \\
fiarbuz-á & fiarbuz-ív \\
fiarbuz-évi & fiarbuz-ám \\
\hline
Gen. & fiarbúz & fiarbuz-ý \\
Dat. & fiarbuz-ém & fiarbuz-ámy \\
Acc. & fiarbuz-évi & fiarbuz-áx \\
Inst. & fiarbuz-é & fiarbuz-ý \\
Loc. & & \\
Voc. & & \\
\hline
\end{tabular}

In these 2\textsuperscript{nd} declension stems, Post-stem stress throughout the paradigm will be analysed as faithfulness to a lack of stem stress, as we will see in the analysis of Post-stem stress in
Chapter 2. The lack of inflection in the nominative and accusative singular does not affect the rest of the singular paradigm. Most stems do not allow a singular uninflected form to affect the rest of the sub-paradigm; specifically, multisyllabic stems are unaffected by singular uninflected forms, and remain faithful to the lack of inherent stress.

But some monosyllabic masculine 2nd declension stems allow the lack of inflection in the singular paradigm to effect stem stress in the singular; this is mobile pattern M3. An example of M3 is /kraj/ ‘country’:

(14) 2nd declension masculine: M3
/kraj/ ‘country’

<table>
<thead>
<tr>
<th></th>
<th>Sg</th>
<th>Pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nom.</td>
<td>kráj</td>
<td>kraj-i</td>
</tr>
<tr>
<td>Gen.</td>
<td>kráj-u</td>
<td>kraj-iv</td>
</tr>
<tr>
<td>Dat.</td>
<td>kráj-evi</td>
<td>kraj-ám</td>
</tr>
<tr>
<td>Acc.</td>
<td>kráj</td>
<td>kraj-i</td>
</tr>
<tr>
<td>Inst.</td>
<td>kráj-em</td>
<td>kraj-ámy</td>
</tr>
<tr>
<td>Loc.</td>
<td>kráj-i</td>
<td>kraj-áx</td>
</tr>
<tr>
<td>Voc.</td>
<td>kráj-u</td>
<td>kraj-i</td>
</tr>
</tbody>
</table>

M3 is characterized by stem stress in the singular, and inflectional stress in the plural. The difference between this group and the previous group of Post-stem stressing nouns like /harbuz/ in (13) is that the vast majority of M3 stems like /kraj/ are monosyllabic stems, while P stems are multisyllabic. In this analysis, Chapter 4 shows that monosyllabicity, combined with a zero ending in the singular paradigm, predicts Mobile stress pattern M3.

10 The variant [harbûze] is also accepted, in which case I assume it is lexically specified; for such special
To summarize thus far, both 1\textsuperscript{st} and 2\textsuperscript{nd} declension masculine stems show fixed stress, but the non-fixed patterns of stress are different for each group. The different endings in the declension types predict that different types of non-fixed stress patterns will arise.

Specifically, stem stress occurs in the sub-paradigm where there is a form without an overt inflectional ending. 1\textsuperscript{st} declension shows M1 and M2 patterns with stem stress in the plural, and neuter 2\textsuperscript{nd} declension shows M1 stress with stem stress in the plural. Both of these also show a form that lacks overt inflection in the plural. Where the zero form is in the singular, 2\textsuperscript{nd} declension masculine stems show M3 stress with stem stress in the singular, and P stress for multisyllabic stems.

1.3.5 Stress in 3\textsuperscript{rd} & 4\textsuperscript{th} declension nouns

Stems of the 3\textsuperscript{rd} declension (feminine stems ending in consonants), are Fixed stress stems, like /slábost/ ‘weakness’ below:

\begin{align*}
(15) \quad & \text{3\textsuperscript{rd} declension: Fixed} \\
& /slábost/ \ 'weakness' \\
\begin{array}{|l|l|}
\hline
\text{Nom.} & \text{Sg} & \text{Pl} \\
\text{slábist} & \text{slábost'-i} \\
\hline
\text{Gen.} & \text{slábit-st} & \text{slábit-st-ej} \\
\text{slábost-y} & \text{slábit-st-am} \\
\hline
\text{Dat.} & \text{slábost'-i} & \text{slábit-st-i} \\
\text{slábost'-i} & \text{slábit-st-amy} \\
\hline
\text{Acc.} & \text{slábist'} & \text{slábit-st-ax} \\
\text{slábit'} & \text{slábit-st-i} \\
\hline
\text{Inst.} & \text{slábost'-u} & \text{slábit-st-amy} \\
\text{slábost'-u} & \text{slábit-st-ax} \\
\hline
\text{Loc.} & \text{slábost'-i} & \text{slábit-st-ax} \\
\text{slábit'-i} & \text{slábit-st-i} \\
\hline
\end{array}
\end{align*}

\begin{align*}
\text{Voc.} & \text{slábit'} \\
\text{slábit'} & \text{slábit-st-i} \\
\end{align*}

\begin{align*}
\text{cases, see Chapter 4.}
\end{align*}
This group of stems is comprised exclusively of stress fixed to one position; no Mobile or Post-stem stress patterns are observed for nouns which are feminine and end in a consonant. Bilodid 1969 notes a few exceptions to this generalization; wherever such exceptions occur, stress is on the inflection only in some plural oblique cases (depending on the stem). For the purposes of our analysis, I will assume that the 3rd declension is fixed in terms of stress. The lack of non-Fixed stress distinguishes this declension from 1st and 2nd in terms of stress.

The last declension group is 4th declension. Recall that this is a very small group of nouns: those with suffixes –at- and –en- within their inflectional paradigms. The nouns with –at (a type of diminutive suffix) are always realized with this suffix (never alone) and [-át] is always stressed, for example:

(16) 4th declension –at nouns

/kurtʃ-át/  ’chick’

<table>
<thead>
<tr>
<th>Nom.</th>
<th>Sg</th>
<th>Pl</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>kurtʃ-á</td>
<td>kurtʃ-át-a</td>
</tr>
<tr>
<td></td>
<td>kurtʃ-á</td>
<td>kurtʃ-át-a</td>
</tr>
<tr>
<td>Acc.</td>
<td>kurtʃ-át-a</td>
<td>kurtʃ-át</td>
</tr>
</tbody>
</table>

(note that the [t] of the [at] suffix is not realized in nom. and acc. singular cases)

The stress in these stems is always stable, and rests on the [át] morpheme; I assume this ending is part of the stem, and stress is fixed. The other 4th declension nouns show –en suffixes; these are the ‘pluralia tantum’ nouns: they do not have singular paradigms and are inflected only for plural forms. Stress is usually Fixed, but there are also forms which always show P stress with stress on all inflectional endings. Thus if we were to extend our analysis to these stems, they would be treated as either inherently stressed (Fixed) or
unstressed (Post-stem) stems. Monosyllabic stems in this class fit no particular
description and are usually treated as exceptions which vary stress case by case; i.e. stress
shifts between stem and inflection depending on case. I set the 4th declensions stems
aside for the analysis and assume lexical specification: the stems must be lexically
specified not only for stem stress, but also for which case shows which type of stress.

1.4 Case instability
For the most part, we will see Mobile stem examples where the division between singular
and plural stress is clear: stress in on the inflection either in the singular or the plural
paradigm. There is independent evidence for this particular singular vs. plural split in
many languages, including the East Slavic languages Ukrainian, Russian, and
Belorussian. For example, as noted above, there are nouns which have only plural, and
not singular forms.

Pronouns also provide evidence for the division according to number; gender distinctions
present in the singular forms of pronouns are lost in the plural in East Slavic. Pronouns
can be masculine, feminine, or neuter in the singular, but there is no specific gender in
the plural. The examples from Ukrainian below show no distinctions for gender:

---
11 Bilodid (1969) characterizes the division is as follows. Nominative, dative, and locative show stem
stress. Genitive and Instrumental cases show inflectional stress. For example /l’ud/ ‘people’ has the paradigm:

<table>
<thead>
<tr>
<th>Case</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominative</td>
<td>l’úd-y</td>
</tr>
<tr>
<td>Genitive</td>
<td>l’ud-ëj</td>
</tr>
<tr>
<td>Dative</td>
<td>l’úd’-am</td>
</tr>
<tr>
<td>Locative</td>
<td>l’úd’-ax</td>
</tr>
<tr>
<td>Instrumental</td>
<td>l’ud’-mý</td>
</tr>
</tbody>
</table>
(17) Ukrainian 3rd person nominative pronoun: /von/

<table>
<thead>
<tr>
<th></th>
<th>Singular</th>
<th>Plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masculine</td>
<td>vin</td>
<td>vony</td>
</tr>
<tr>
<td>Feminine</td>
<td>vona</td>
<td>vony</td>
</tr>
<tr>
<td>Neuter</td>
<td>vono</td>
<td>vony</td>
</tr>
</tbody>
</table>

(18) Ukrainian 1st person possessive pronoun: /moj/

<table>
<thead>
<tr>
<th></th>
<th>Singular</th>
<th>Plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masculine</td>
<td>mij</td>
<td>moji</td>
</tr>
<tr>
<td>Feminine</td>
<td>moja</td>
<td>moji</td>
</tr>
<tr>
<td>Neuter</td>
<td>moje</td>
<td>moji</td>
</tr>
</tbody>
</table>

This separation between singular and plural subparadigms is important in our analysis of stress facts; most stems showing mobile stress show stress shifting from one position in all cases in the singular to another position for all cases in the plural subparadigm.

But there are some stems which show intra-paradigmatic instability in terms of stress divisions between the singular and plural paradigms. Most nouns which show this type of unstable paradigm are 1st declension nouns; a few other nouns in other declensions also show the instability. For example, some stems show the vocative singular patterning with the plural paradigm in terms of stress; i.e. vocative singular stress in on the stem, as in the plural:
Thus not all cases which share number also share stress. Some examples are even more complex; the stress shifts across number affects the accusative and vocative singular, and the oblique plural cases in (20):

(20) /noh/ ‘foot’

<table>
<thead>
<tr>
<th></th>
<th>Nom</th>
<th>Gen</th>
<th>Dat</th>
<th>Acc</th>
<th>Inst</th>
<th>Loc</th>
<th>Voc</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG</td>
<td>nofi-á</td>
<td>nofi-ý</td>
<td>nofi-í</td>
<td>nofi-u</td>
<td>nofi-óju</td>
<td>nofi-í</td>
<td>nofi-o</td>
</tr>
<tr>
<td>PL</td>
<td>nófi-y</td>
<td>nífi</td>
<td>nófi-ám</td>
<td>nófi-y</td>
<td>nófi-ámy</td>
<td>nófi-áx</td>
<td>nófi-y</td>
</tr>
</tbody>
</table>

The analysis for these forms in Chapter 4 is an extension of the analysis for forms which show clear singular vs. plural divisions. The trigger for Mobile stress is still the presence of a form without overt inflection; which forms are influenced is the only difference.

Since the vast majority of Mobile nouns do not show this type of instability, Mobile stress in Chapters 2 and 3 abstracts away from the unstable cases, and stem vs. inflectional stress is illustrated with clear singular vs. plural divisions.
1.5 Ukrainian vs. Russian Patterns

Since most readers familiar with Slavic stress will be more familiar with the Russian data for nominal inflectional stress, I conclude this chapter by noting some important Ukrainian/Russian differences. Ukrainian and Russian are closely related, and with Belorussian, form the East Slavic language group. More details of Russian stress will follow in Chapter 5. For non-OT generative accounts for Russian see especially Halle 1973, 1975, 1997, Idsardi 1992, Kenstowicz 1998; within OT see Alderete 1999 and Revithiadou 1999 who offer different approaches to the question of how the different stress patterns in Russian, among other languages, should be accounted for within OT.

Noun stems in Russian, like Ukrainian, are usually realized with Fixed stress; this is the most prevalent pattern of stem stress in both languages. A statistical study by Zaliznjak 1967 shows that 92% of Russian noun stems show Fixed stress. Ukrainian statistical studies of stress are not readily available, but according to Ukrainian grammars (cf. “Ukrainian References” section), the majority of Ukrainian nouns stems also show Fixed stress. For example, Bilodid 1969 writes that the ‘great majority’ of stems show Fixed stress (34). In my own study of Ukrainian, I also found a majority of stems showing Fixed stress.12

12 My database is a compilation of all mobile and post-stem stressing forms, but not all fixed forms (given their vast number); hence a precise percentage of fixed forms is beyond the scope of this study.
After Fixed stress, the next most prevalent pattern in East Slavic is Post-stem stress. The Post-stem stressing phenomenon in Russian is well established in the literature. (21) is a typical example in the literature of a Russian Post-accenting stem /stol/; I provide the Ukrainian cognate for comparison:

(21) Post-stem stress: /stol/

<table>
<thead>
<tr>
<th>Ukrainian</th>
<th>Russian</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>stil</td>
<td>stól</td>
<td>‘table nom.sg.’</td>
</tr>
<tr>
<td>stol-ú</td>
<td>stol-ú</td>
<td>‘table dat. sg.’</td>
</tr>
<tr>
<td>stol-ý</td>
<td>stol-í</td>
<td>‘table nom.pl.’</td>
</tr>
<tr>
<td>stol-ám</td>
<td>stol-ám</td>
<td>‘table dat. pl.’</td>
</tr>
</tbody>
</table>

In Russian, like Ukrainian, P stems are those with stress on the inflection where there is an inflectional ending; the analysis of P stems in Chapter 2 for Ukrainian also holds in Russian. (The Post-stem stress analysis is reviewed for Russian in Chapter 5).

As for Mobile stress, Russian also shows the three groups M1-M3 outlined above for Ukrainian. In addition, Russian shows some variation of Mobile stress which does not exist in Ukrainian. There is also some disagreement in the Russian literature about what the patterns illustrate. For example, consider the group of Russian stems which correspond to the M2 group in Ukrainian; this is the group which shows inflectional stress in the singular, and initial stem stress in the plural. (22) shows Ukrainian / Russian cognates (details of the Russian data are in Chapter 5):

(22) M2

<table>
<thead>
<tr>
<th>Ukrainian:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>/fiolov/ ‘head’</td>
<td>fiolov-á</td>
</tr>
</tbody>
</table>
Brown et.al. 1996 characterize this group as a different type of Post-stem stress, with an additional initial stress rule. Halle 1973 proposes that the class is marked as exempt from his ‘Oxytone rule’\(^{13}\) which stresses the inflectional vowel, thus resulting in Post-stem stress. Stems like /golov/ must be specially marked as not affected by this rule; Halle proposes a ‘Blocking rule’ which marks particular case forms in particular nouns as exceptions.

As we will see in more detail in Chapter 5, a pattern like M2 necessitates more rules in rule-based accounts of Russian; in constraint-based accounts, this pattern has been analyzed as requiring additional specifications underlyingly by Revithiadou 1999, or by exclusion of the M2 pattern altogether as in Alderete 1999\(^{14}\). The analysis presented here does not propose either of these explanations for M2.

Instead, the present proposal assumes all stems are either specified for stress or unspecified for stress in the input. The differences between Post-stem and Mobile classes are ones of faithfulness: faithfulness to the input stress in the former, and to a base form in the latter. The base form in the inflectional paradigms is a form without overt

\(^{13}\) This rule ‘assigns stress to the final vowel (or in certain case forms, e.g. the instr. pl., to the pre-final vowel) in words containing stems with no inherent stress’:

\[(1) \text{Halle (1973) Oxytone rule:} \]

\[V \rightarrow [+\text{Stress}] \ X ___ (+C*V*)] \]

where X contains no [+S], and (+C*V*) represents specially marked suffixes.
inflection; it triggers stem stress in the Mobile pattern. Chapter 5 shows that the principles established for Ukrainian Mobile stress can be extended to account for all patterns in Russian, with some changes that reflect the differences between the languages.

1.6 SUMMARY

The chart in (6) which summarizes declension types is expanded in (23) to include the type of stress according to declension type. (Recall that F=Fixed ; P=Post-stem; M1-M3=Mobile):

(23) Stress and Declension type

<table>
<thead>
<tr>
<th>Declension</th>
<th>Gender</th>
<th>Nom. Sg.</th>
<th>Gen. Pl.</th>
<th>Stress Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>Fem. &amp; Masc.</td>
<td>-a</td>
<td>-∅</td>
<td>F, M1, M2</td>
</tr>
<tr>
<td>2nd</td>
<td>Neuter</td>
<td>-o or –e</td>
<td>-∅</td>
<td>F, M1</td>
</tr>
<tr>
<td></td>
<td>Masculine</td>
<td>-∅</td>
<td>-iv</td>
<td>F, P, M3</td>
</tr>
<tr>
<td>3rd</td>
<td>Feminine</td>
<td>-∅</td>
<td>-ej</td>
<td>F</td>
</tr>
</tbody>
</table>

We have seen in this chapter that declension types define sets of stems according to gender and to the types of endings, specifically where the zero type of ending is found. 1st declension and 2nd declension neuter nouns show zero endings in the plural subparadigm, for the genitive form. 2nd declension masculine and 3rd declension nouns show a singular form without an overt ending: the nominative (and in some cases the accusative). Although declensions are in part based on presence of a zero form, they are also dependent on gender and types of endings besides zero endings (eg. masculine

14 Alderete 1999 excludes this group altogether citing ‘weak empirical support (184)’ in Russian. After Ukrainian grammarians, I consider M2 a significant group in Ukrainian; cf. Chapter 4.
vs. feminine, [-iv] vs. [-ej], and other ending differences distinguish 2nd and 3rd
decension).

The analysis for stress proposed here focuses only on the zero ending distinctions, and
leaves other distinctions of declension classes like gender behind. The following chapters
will formalize the claim that where non-fixed stress patterns arise, they differ according
to whether there are forms with no overt inflection in the paradigm which can trigger
faithfulness to that form. Before formalizing the most complex cases of Mobile stress,
Chapter 2 shows the analysis for the relatively simpler cases of Fixed and Post-stem
stressiing nouns: those which are faithful to their presence or lack of inherent stress.
Chapter 2

Input/Output Faithfulness to Presence/Absence of Stress

2.1 INTRODUCTION

In Chapter 1 we saw that the three types of stress patterns Ukrainian noun stems can exhibit in inflectional paradigms are:

- **F (Fixed)**: stress fixed on the same stem syllable
- **P (Post-stem)**: stress on inflectional ending (where there is one)
- **M (Mobile)**: stress sometimes on inflection, sometimes on stem; shifting between singular and plural sub-paradigms

The main problem the Ukrainian data presents us with is how to distinguish the different types of stress, given that no surface phonological characteristic helps us to predict when a stem has or does not have Fixed lexical stress. The proposal here is that the stress patterns crucially depend on whether there is presence of stem stress in the input, or an absence of stem stress in the input.

This chapter shows that presence of stress in the input results in nouns which show Fixed stress, whereas absence of stem stress results in Post-stem stress (and Mobile stress as we will see in Chapter 3). Both F and P types of stress are characterized by faithfulness to stem stress: F is a result of faithfulness to a presence of stress in the input; P is a result of faithfulness to an absence of stress in the input.
2.2 THEORETICAL FRAMEWORK

The theoretical framework I assume here is Correspondence Theory (McCarthy and Prince 1995). All of the definitions and logical statements in this section are based on McCarthy and Prince 1995.

The notion of correspondence is defined between pairs of elements in different strings:

(24) \textit{Correspondence}: Given two strings S\textsubscript{1} and S\textsubscript{2}, correspondence is a relation \( R \) from the elements of S\textsubscript{1} to those of S\textsubscript{2}. Segments \( \alpha \) and \( \beta \) are referred to as \textit{correspondents} of one another when \( \alpha R \beta \).

For example, Input-Output correspondence relates the input and output strings:

(25) \textit{I/O Correspondence}: Given two strings S\textsubscript{1} (I) and S\textsubscript{2} (O) correspondence is a relation \( R \) from the elements of S\textsubscript{1} (I) to those of S\textsubscript{2} (O). Segments \( \alpha \) (an element of an input string S\textsubscript{1}) and \( \beta \) (an element of an output string S\textsubscript{2}) are referred to as correspondents of one another when \( \alpha R \beta \).

Correspondence can also hold between other types of strings, not only I-O strings. In Chapter 3, we will see correspondence between two Output strings:

(26) \textit{O/O Correspondence}: Given two strings S\textsubscript{1} and S\textsubscript{2}, correspondence is a relation \( R \) from the elements of S\textsubscript{1} to those of S\textsubscript{2}. Segments \( \alpha \) (an element of an output string S\textsubscript{1}) and \( \beta \) (an element of an output string S\textsubscript{2}) are referred to as correspondents of one another when \( \alpha R \beta \).

More details of what kinds of outputs can stand in correspondence to each other in O-O strings follow in Chapter 3. In this chapter, we will be concerned only with I-O correspondence; I-O correspondence is sufficient to predict Fixed and Post-stem stressing nouns in Ukrainian.
In I-O correspondence, constraints can require outputs to be faithful to their correspondent inputs. There are three faithfulness constraints which capture this relation; below I give prose descriptions followed by logical statements (after McCarthy and Prince 1995):

(27) Faithfulness constraints
(a) (MAX)IMALITY: Every element of $S_1$ has a correspondent in $S_2$.
\[
\text{MAX-X: } \forall x \exists x' [x \in S_1 \rightarrow x' \in S_2 \& xRx']
\]

(b) (DEP)ENDENCE: Every element of $S_2$ has a correspondent in $S_1$.
\[
\text{DEP-X: } \forall x \exists x' [x \in S_2 \rightarrow x' \in S_1 \& xRx']
\]

(c) (IDENT)ITY: Correspondent segments must be identical for the feature (F).
\[
\text{IDENT(F): } \forall y \forall y' \forall F [y \sim y' \rightarrow y =_F y']
\]

In this chapter, we will be concerned only with the first two faithfulness constraints, MAX and DEP$^{15}$. Specifically, we will see how extending MAX and DEP correspondence relations to stress allows us to predict the patterns of stress in Ukrainian.

2.3 HEADEDNESS AND FIXED STRESS IN UKRAINIAN

To account for lexical stress in Ukrainian, assume that nouns showing Fixed stress are specified for stress (on a particular syllable) in the lexicon. The fact that Fixed stress forms always realize specified stress is captured in OT by relating faithfulness to stress; the constraint below shows MAX related to stress, based on Alderete 1995$^{16}$:

(28) MAX-STRESS (after Alderete 1995)
\[
\text{For } \forall x, x=\text{stress, } \exists x' [x \in S_1 \rightarrow x' \in S_2 \& xRx']
\]

Every stress prominence in the input must have a correspondent in the output.

$^{15}$ The third Faithfulness constraint in (27), IDENT(F), will play a minor role in Mobile stress patterns in Chapter 4; I do not relate IDENT to stress in this proposal. If an IDENT-STRESS contraint were proposed, stress would need to be a binary feature, i.e.: IDENT[+STRESS] and IDENT[-STRESS] would be required to subsume the role of MAX and DEP in the analysis presented here.

$^{16}$ Alderete calls the constraint “Max-Prom(inence)”; only the label is changed here.
This faithfulness constraint ensures that all stress specified in the input is realized in the output. A candidate which does not realize stress in the same position violates MAX-STRESS if stress is deleted, and there is an entirely new stress on the output syllable. For example, consider the candidates with stress peaks below (‘x₁’ shows the stress peak correspondence between input and output stress peaks, and ‘x₂’ shows a new stress in the output):

(29) **Max: shift vs. deletion**

<table>
<thead>
<tr>
<th>Candidate</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>x₁</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>σ</td>
<td>σ σ</td>
</tr>
<tr>
<td>(b)</td>
<td>x₁</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>σ</td>
<td>σ σ</td>
</tr>
<tr>
<td>(c)</td>
<td>x₂</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>σ</td>
<td>σ σ</td>
</tr>
<tr>
<td>(d)</td>
<td>x₂</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>σ</td>
<td>σ σ</td>
</tr>
</tbody>
</table>

Candidates (a) and (b) satisfy MAX-STRESS, even though the stress has shifted to a different segment in (b). Candidate (c) violates MAX-STRESS because it does not realize the same stress x₁ on the first syllable; thus even though the same syllable is stressed, MAX-STRESS is violated when x₁ is deleted in the process of inserting the new stress peak, x₂. (d) also violates MAX-STRESS because of the deletion of x₁.
A candidate like (b), which shifts stress but satisfies MAX-STRESS by not deleting stress, violates a different constraint. Alderete 1999 proposes the faithfulness constraint below, which penalizes stress shifts.\textsuperscript{17}

(30) \textbf{NO-FLOP (Alderete 1999)}

No Flop Prominence
For $x$ a prominence, $y$ a sponsor, and $z$ an autosegmental link
‘Corresponding prominences must have corresponding sponsors and links.’

Thus NO-FLOP requires that stress be realized on the same position in the input and output: on the same segment, and without any other links to other segments.

The example below shows violations of this constraint:

(31) \textbf{MAX-STRESS and NO-FLOP}

\begin{tabular}{c|c|c|c|c}
 & MAX-STRESS & NO-FLOP \\
\hline
\hline
x
 & /\sigma \sigma \sigma/ \\
\hline
(a) & $x_1$ & \checkmark & \checkmark \\
 & $\sigma \sigma \sigma$ & & \\
(b) & $x_1$ & \checkmark & * \\
 & $\sigma \sigma \sigma$ & & \\
(c) & $x_2$ & * \\
 & $\sigma \sigma \sigma$ & & \\
(d) & $x_2$ & * \\
 & $\sigma \sigma \sigma$ & & \\
\hline
\end{tabular}

Although candidates (b) and (d) realize stress on the same syllable, their differing correspondence relations with the input mean different constraint violations.

\textsuperscript{17} The constraint refers to the stress prominences, the sponsors or segments which bear them, and links which unite stress with those segments. Alderete 1999 also assumes that Russian nouns never allow shifts of input stress. Thus any given candidates with stress on a different syllable is a violation of faithfulness in Alderete 1999, as in the present analysis.
Candidate (b) violates NO-FLOP, while (d) violates MAX-STRESS (and satisfies NO-FLOP vacuously, so no mark is given). A candidate which does not realize stress in the same position as in the input either violates NO-FLOP or MAX-STRESS. The exclusion of NO-FLOP violations makes no difference for the illustration of the analysis, as long as we assume that NO-FLOP and MAX-STRESS are equally ranked; specifically, NO-FLOP, like MAX-STRESS, must be ranked above COINCIDE-RIGHT. For simplicity in the tableaux below, I will assume that any shift in stress position from input to output violates MAX-STRESS, and I do not include NO-FLOP in the tableaux.

Another faithfulness constraint is DEP, which prevents epenthesis. Like MAX, DEP can be related to stress as below; DEP-STRESS prevents insertion of stress:

(32) DEP-STRESS (Alderete 1995)

For each stress, \( \forall x \exists x' \ [x \in S_2 \rightarrow x' \in S_1 \land xRx'] \)

Every stress prominence in the output must have a correspondent in the input.

DEP-STRESS is used in a different way in this proposal than in Alderete 1995. In section 2.5, I propose that a version of DEP-STRESS accounts for Post-stem stress.

First, consider the interaction of faithfulness in other stress-related constraints in Ukrainian grammar, and how we predict Fixed stress from these constraints. Ukrainian words must have stress, and only one prominent stress; these are the characteristics which, as Alderete 1999 writes for Russian, satisfy the notion of Culminativity:¹⁸

¹⁸ Alderete 1999 writes that this unites two different meanings of culminativity: “both the classical sense of Trubetzkoy 1939, and the sense in which it is commonly used in studies of metrical stress (see Liberman and Prince 1977, Hyman 1977, and Hayes 1995).”
Culminativity of Accent (relative to a domain D)
a. Existence requirement: every D has an accent  
b. Uniqueness requirement: every D has exactly one accent that is greater than all others.

We will discuss the uniqueness requirement further in section 2.5. The existential requirement of culiminativity follows “from the constraint Headedness, and the standard assumption that accent is a property of the head of a prosodic foot” (Alderete 1999):

(34) **HEADEDNESS**(HEAD) (after Selkirk 1995)  
Any \( C^i \) must dominate a \( C^{i-1} \), e.g. A Prosodic Word must dominate a Foot.

I assume that stress is always carried by the Head of a Foot. Existence of stress in a word then follows, since (34) states that a word must dominate a Foot (whose Head bears stress).

Every word in Ukrainian must have stress, and with HEAD undominated in a ranking, this is assured. Consider the interaction of HEAD and DEP-STRESS in order to account for a stem without lexical stress in the input receiving stress in the output in tableau (35). The tableau also shows general DEP, which prevents insertion of new segments. (Violations of constraints are shown with an asterisk in the tableau: ‘∗’. Crucial violations are followed by an exclamation mark: ‘!’. There is no crucial ranking of general DEP with the other constraints (shown by a double line). Because we cannot tell which violation eliminates candidate (c), there are only potential crucial violations, shown in brackets: ‘(!)’ .)
Candidate (35)(a) satisfies Headedness by inserting stress onto the only available syllable. General DEP prohibiting insertion of entire segments prevents another syllable from being inserted to bear stress, as in (c). The output in (a) has stress which was not present in the input, violating DEP-STRESS, the constraint against stress insertion. But this violation is less severe than a violation of HEAD, which eliminates (b) as a possible candidate, even though (b) is fully faithful to the input form. With the ranking HEAD >> DEP-STRESS, it is assured that every word without stress in the input must receive stress.

Now consider the interaction of HEAD and MAX-STRESS. A candidate like (c) in the tableau in (36) loses because it violates HEAD; there is no prosodic head since no segment bears stress. It also violates MAX-STRESS, since it deletes input stress marking.

(36) Fixed stress: /káʃ/ 'porridge'

<table>
<thead>
<tr>
<th>/káʃ/+a</th>
<th>HEAD</th>
<th>MAX-STRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) káʃ-a</td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>(b) kaʃ-á</td>
<td></td>
<td>*(!)</td>
</tr>
<tr>
<td>(c) kaʃ-a</td>
<td>*(!)</td>
<td>*(!)</td>
</tr>
</tbody>
</table>

Candidate (a) is optimal since it faithfully realizes the stress specified in the input, satisfying both HEAD and MAX-STRESS. Recall that I assume in all the tableaux that a candidate like (b) shows a form which deletes and adds new stress, rather than shifting...
stress. This means that (b) incurs a MAX-STRESS violation. Candidate (c) deletes stress, and also violates MAX-STRESS.

Notice that MAX-STRESS does all the ‘work’ of HEAD and more in the particular case in (36), because the input form shows stress. Any violation of HEAD when there is an input stress implies a MAX-STRESS violation. I will assume from now on that HEAD is undominated in the analysis. In the tableaux which follow, where there is an input with stress, I present candidates which satisfy the requirement that all words have stress, omitting candidates without stress and the necessity for a HEAD constraint in those tableaux.

The only constraint in our system which can come into conflict with MAX-STRESS in later sections is the constraint COINCIDE-RIGHT, which licenses stressed syllables at the right edge of the stem:

(37) **COINCIDE-RIGHT (STRESS, STEM):**

COINCIDE (Stressed \(\sigma\), Rightmost(\(\sigma\), stem)) (after Zoll 1996)

For x stressed syllable, \(\forall x\exists y[y = \text{Rightmost}(\sigma, \text{stem}) \text{ and } \text{Coincide}(x, y)]\)

(i) For all x stressed syllables, there exists some y such that y is a rightmost stem syllable and coincides with x.

(ii) Assess one mark for each value of x for which (i) is false.
Because this analysis necessitates a constraint which assigns categorical violations (the
categorical nature is motivated in Chapter 4), Coincide-R may be replaced with
Alignment only if Alignment is considered a categorical, and not gradient, constraint. c.f.
McCarthy 2002, where the proposed Align-by-X could be applied to the case at hand as:

(38) \text{ALIGN-BY-} \sigma (\text{Stress, Stem, R}): \text{No syllable stands between the right-edge of stress and the right edge of stem.}

The analysis here uses Coincide, but a categorical Alignment constraint like (38) will also
do the job.

I explain the motivation for COINCIDE-R in the next section, but for now examine the
potential conflict with MAX-STRESS in tableau (39); COINCIDE-R must be ranked below
MAX-STRESS:


<table>
<thead>
<tr>
<th>/múlar/+y</th>
<th>MAX-STRESS</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) múlar-y</td>
<td>*!</td>
<td>*</td>
</tr>
<tr>
<td>(b) mulár-y</td>
<td>*!</td>
<td>*</td>
</tr>
<tr>
<td>(c) mular-ý</td>
<td>*(!)</td>
<td>*</td>
</tr>
<tr>
<td>(d) mular-y</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crucially, MAX-STRESS >> COINCIDE-R so that (39)(a), which remains faithful to input
specification of stress, is a better candidate than (b), which satisfies COINCIDE-RIGHT.

In summary, in the constraint interaction we have seen thus far, undominated MAX-
STRESS explains nouns with input stress in Ukrainian. The lexical entry includes
information about stress, and stems specified as stress-bearing in the lexicon must retain
that stress. The retention is due to the satisfaction of MAX-STRESS, which requires that
input stress be faithful in the output. The only crucial ranking of MAX-STRESS is with respect to COINCIDE-RIGHT. The ranking of constraints thus far is:

(40) Constraints

\[
\begin{array}{c|c}
MAX\text{-STRESS, NO-FLOP} & HEAD \\
\mid & \\
COINCIDE\text{-RIGHT} & \text{DEP\text{-STRESS}}
\end{array}
\]

2.4 Post-stem stress

There are 296 stems given by Holovashchuk 1995 as Post-stem stressing stems in Ukrainian. (cf. "Database" section for a representative sample.) Post-stem stressed nouns are distinguished from the Fixed stress stems discussed in section 2.2 by an important element of the analysis: P stems are unspecified for stress underlyingly. As I noted above, in this respect I follow previous accounts of Russian stem stress. But the current proposal differs from these accounts because I claim that faithfulness to a lack of stress drives the Post-stem stress pattern; there is no need here to specifically refer to P stems in the lexicon or in special rules or constraints. Most accounts for Russian (e.g. Kiparsky 1973 and Halle 1973) claim that to predict Post-stem stress, a specific rule must apply accent to the immediately following syllable for such stems. In this spirit, Alderete 1999 proposes that post-stressing stems result from a specific constraint that ensures stress on the vowel adjacent to the stem:

(41) Post-Stem-Prom (PSP) = Align (Prom, L, Stem, R)

The left edge of the stress prominence must coincide with the right edge of the stem.
Note that PSP stipulates the phenomenon of post-stem-stress rather than having P stress fall out of a ranking of constraints; it also appeals to opposite-edge categorization, since the right edge of the stem is anchored with the left edge of the prominence which surfaces as accent. The alternative analysis I propose does not anchor opposite edges, and captures the effect of post-accenting stems with a transparent ranking of constraints already present in the grammar.

2.4.1 Stem position faithfulness

In section 2.2, we saw that faithfulness to the presence of stress must be highly ranked, i.e. MAX-STRESS is ranked higher than COINCIDE-R. For the Post-stem stressing forms, we will see evidence that faithfulness to an absence of stress, by the constraint DEP-STRESS, must likewise be ranked high. Below, I repeat the relevant faithfulness to stress constraints given in (28) and (32):

(28)  MAX-STRESS: For $x$ stress, $\forall x \exists x' [x \in S_1 \rightarrow x' \in S_2 \land xRx']$

   Every stress prominence in the input must have a correspondent in the output.

(32)  DEP-STRESS: For $x$ stress, $\forall x \exists x' [x \in S_2 \rightarrow x' \in S_1 \land xRx']$

   Every stress prominence in the output must have a correspondent in the input.

One additional refinement is necessary for the analysis given in section 2.5.2 below: DEP-STRESS must be specified for stem position. This is a type of position-sensitive faithfulness (Selkirk 1995, Beckman 1995, 1997), where the stem is the position of privilege. This distinguishes faithfulness to stress in general from faithfulness to stress on the stem. Positional faithfulness to prominence is proposed by Alderete 1999; (42) is based on Alderete’s ‘Max-PromStem’:
(42) **MAX-STRESS\text{STEM}** (after Alderete 1999)
For \(x\) stem stress, \(\forall x\exists x' [x\in S_1 \rightarrow x'\in S_2 & xRx']\)
Every stem stress prominence in the input must have a correspondent in the output.

(43) **DEP-STRESS\text{STEM}**
For \(x\) stem stress, \(\forall x\exists x' [x\in S_2 \rightarrow x'\in S_1 & xRx']\)
Every stem stress prominence in the output must have a correspondent in the input.

(43) requires that for any output stress on the stem there must be a correspondent in the input; that is, stress should not be inserted in stem position. **DEP-STRESS\text{STEM}** is the constraint which is crucial for the analysis of P stems here. Although Alderete 1999 proposes special MAX relativized to stem, and notes the possibility of a DEP relativized to stem position, **DEP-STRESS\text{STEM}** is not an active constraint in Alderete’s system for Russian P stems. In the present analysis, faithfulness to stem stress will help account for Post-stem stressing nouns.

2.4.2 Post-stem stress: Analysis

This section presents the analysis of the P stress pattern. I propose that P stress is a result of faithfulness restrictions on stem stress: an inherent lack of stress on a stem must be preserved. Therefore the system proposed here uses the **DEP-STRESS\text{STEM}** constraint in (43) to predict the Post-stem stressing pattern.

Recall that the P pattern shows stress on the inflectional ending when there is one, an example of which is given below for a 2\textsuperscript{nd} declension stem:
Stressless stems like /fiarbuz/ resist stress insertion by inserting stress on the affix instead for forms like [fiarbuz-á]. When an inherently stressless stem is followed by a suffix, insertion of stress onto a suffix violates only general DEP-STRESS, not special DEP-STRESSSTEM, as we see in tableau (45).

Since HEAD ensures that all words in Ukrainian have stress, a candidate like (d) is eliminated. (d) is faithful to the lack of input stress, satisfying DEP-STRESS, but DEP-STRESS is less important, and ranked below HEAD. All of (a-c) necessarily violate DEP-STRESS in the process of satisfying HEAD.
Of these candidates which satisfy HEAD, (a) is optimal because by inserting stress onto
the suffix it satisfies DEP-STRESSSTEM. The special constraint DEP-STRESSSTEM is as yet
unranked with respect to general DEP-STRESS (the lack of a crucial ranking shown by the
double line); any ranking of this constraint will ensure that candidate (a) is optimal.
The constraint MAX-STRESS is likewise unranked here; I omit it in later tableaux in this
section because it is vacuously satisfied by all candidates and unranked with respect to
the other constraints.

Distinguishing specific DEP-STRESSSTEM predicts P stems; the stem distinction is a crucial
step. If DEP-STRESS were only general, we would expect any of the candidates (a,b,c) to
be equally bad in terms of faithfulness. Candidate (a) is optimal because it satisfies the
specific constraint DEP-STRESSSTEM which requires that the stem not bear stress. The
specific DEP-STRESSSTEM thus distinguishes crucial violations of the specific constraint for
candidates (b) and (c) which do insert stress on the stem.

Not all nouns have an inflectional ending like the form in (45). Sometimes in Post-stem
stressing paradigms, there are affix-less forms, like the nominative and accusative
singular forms which appear without a suffix for /arbuz/ in (44). How do we predict
stress on stems without inflectional endings? Since there is no inflectional ending in the
nominative example, the surface form cannot fully satisfy DEP-STRESSSTEM; there is no
non-stem position available for the stress. An affix-less form like [arbúz] motivates the
constraint COINCIDE-R as given in (37) and repeated below:

(37) Coincide-Right (Stress, Stem):

COINCIDE (Stressed $\sigma$, Rightmost($\sigma$, stem)) (after Zoll 1996)
For x stressed syllable, $\forall x \exists y [y = \text{Rightmost} (\sigma, \text{stem}) \text{ and } \text{Coincide} (x,y) ]$
(i) For all x stressed syllables, there exists some y such that y is a rightmost stem syllable and
Coincide-Right ensures that default stressed syllables are at the rightmost edge of the
stem, as in tableau (46):

(46) Coincide-Right

<table>
<thead>
<tr>
<th>/fiarbúz/</th>
<th>DEP</th>
<th>HEAD</th>
<th>DEP-STRESSSTEM</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) fiarbúz</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*!</td>
</tr>
<tr>
<td>(b) fiár buz</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*!</td>
</tr>
<tr>
<td>(c) fiarbuz</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*!</td>
</tr>
<tr>
<td>(d) fiar buz-á</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*!</td>
</tr>
</tbody>
</table>

Recall that the general DEP constraint prohibits epenthesis, so that an inflectional ending
cannot be inserted as in (d). Candidate (c) is eliminated because it fails HEAD, by having
no stress. The tableau above also shows that HEAD must be ranked above faithfulness to
a lack of stem stress, DEP-STRESSSTEM. Both (a) and (b) are equal with respect to violations
of DEP-STRESSSTEM, since both insert stress and must insert it on stem position (since there
is no inflectional ending inserted as a new segment). But because (a) satisfies COINCIDE-
R by realizing stress on the rightmost edge of the stem, whereas (b) violates COINCIDE-R,
(a) is optimal.

Note that the inclusion of COINCIDE-Right in (46) determines the optimal candidate, but
the relative ranking of the constraint itself is undetermined. We distinguish the relative
ranking by returning to the case of [fiarbúz-á] shown in (45). Now, with COINCIDE-R, we
see that DEP-STRESSSTEM is satisfied in the optimal candidate, at the expense of DEP-
STRESS and COINCIDE-R:
(47) P stress on affix: [fiarbuz-á]

<table>
<thead>
<tr>
<th>/ fiarbuz+a/</th>
<th>HEAD</th>
<th>DEP-STRESSSTEM</th>
<th>COINCIDE-R</th>
<th>DEP-STRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) fiarbuz-á</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b) fiarbúz-a</td>
<td></td>
<td>*!</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(c) fiárbus-a</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(d) fiarbuz-a</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The competition between (a) and (b) shows us that DEP-STRESSSTEM >> COINCIDE-R. COINCIDE-R is satisfied in candidate (b), but this candidate is not optimal; it crucially violates DEP-STRESSSTEM, which the optimal candidate (a) satisfies. The crucial ranking of DEP-STRESSSTEM >> COINCIDE-R ensures (a) is optimal.

A summary of the crucial rankings for Post-Stem stress established above is:

(48) P stress ranking

```
HEAD
  DEP-STRESSSTEM
  | DEP-STRESS
  COINCIDE-RIGHT
```

Note that general DEP-STRESS is not crucially ranked with respect to its specific counterpart, DEP-STRESSSTEM, nor with COINCIDE-R. The P pattern is predicted by a system which recognizes the lack of stem stress in the input as a crucial characteristic, and preserves this by the differentiation of the faithfulness constraint DEP-STRESS to stem position. Since it is clear from this section that HEAD is undominated by the DEP faithfulness constraints which it might come into conflict with, I will not show any more candidates in the tableaux without stress, and show only those which satisfy Headedness.
There is one additional point to be made for those suffixes which are multisyllabic.

Usually, disyllabic suffixes attached to inherently unaccented stems realize stress on the initial syllable. This is not predicted by DEP-STRESS\textsubscript{STEM} $\gg$ COINCIDE-R alone, since either of the suffixal syllables would be equally plausible heads, given the categorical nature of COINCIDE-R. Consider the example below, the dative singular for /tesl’ar/ ‘carpenter’:

(49) Multisyllabic suffixes: /tesl’ar+évi/ ‘carpenter dat.sg.’

<table>
<thead>
<tr>
<th>/tesl’ar+évi/</th>
<th>DEP-STRESS\textsubscript{STEM}</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>? (a) tesl’ar-évi</td>
<td>*</td>
<td>!</td>
</tr>
<tr>
<td>? (b) tesl’ar-évi</td>
<td>!</td>
<td>*</td>
</tr>
<tr>
<td>(c) tesl’ár-évi</td>
<td>!</td>
<td>*</td>
</tr>
</tbody>
</table>

Let us assume that for these cases, the first syllable of the suffix is chosen as a result of the markedness constraint Nonfinality\textsuperscript{19}, given below:

(50) NONFINALITY: The head (foot, syllable) of the prosodic word must not be final

Assuming that stress is realized on the head of the prosodic word, the markedness constraint in (50) prevents stress from being realized on the final syllable of the suffix:

(51) Multisyllabic suffix : /tesl’ar+évi/ ‘carpenter dat.sg.’

<table>
<thead>
<tr>
<th>/tesl’ar+évi/</th>
<th>DEP-STRESS\textsubscript{STEM}</th>
<th>COINCIDE-R (STRESS, STEM)</th>
<th>NONFINALITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\not\gamma$(a) tesl’ar-évi</td>
<td>*</td>
<td>*</td>
<td>!</td>
</tr>
<tr>
<td>(b) tesl’ar-évi</td>
<td>!</td>
<td>*</td>
<td>!</td>
</tr>
<tr>
<td>(c) tesl’ár-évi</td>
<td>!</td>
<td>*</td>
<td>!</td>
</tr>
</tbody>
</table>

\textsuperscript{19} Thanks to Hubert Truckenbrodt for this suggestion
The tie between (a) and (b), which both violate COINCIDE-R by realizing suffixal stress, is broken by NONFINALITY, which is satisfied by (a). The relative ranking of NONFINALITY is not established by considering this form. But consider again the unaffixed form [teslár], shown with the new constraint in (52):

(52) Affixless form: /tesl’ar/ ‘carpenter nom.sg.’

<table>
<thead>
<tr>
<th>/tesl’ar/</th>
<th>DEP-STRESSSTEM</th>
<th>COINCIDE-R (STRESS, STEM)</th>
<th>NONFINALITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) tésl’ar</td>
<td>*</td>
<td>*</td>
<td>!</td>
</tr>
<tr>
<td>(b) tesl’ár</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

The ranking of NONFINALITY below COINCIDE-R ensures that NONFINALITY does not supercede rightmost stem stress alignment for unaffixed forms. Since NONFINALITY is ranked below COINCIDE-R, it does not affect the decision in (52); instead, candidate (b) wins by virtue of satisfying COINCIDE-R.

Since NONFINALITY must be ranked below COINCIDE-R, it is also ranked below DEP-STRESSSTEM by transitivity. We see that this ensures that the single syllable of an inflectional affix can be stressed, even though it is final:

(53) Monosyllabic suffix: /tesl’ar+a/ ‘carpenter gen.sg.’

<table>
<thead>
<tr>
<th>/tesl’ar+a/</th>
<th>DEP-STRESSSTEM</th>
<th>COINCIDE-R (STRESS, STEM)</th>
<th>NONFINALITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) tésl’ar-á</td>
<td>*</td>
<td>*</td>
<td>!</td>
</tr>
<tr>
<td>(b) tesl’ár-a</td>
<td>*!</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(c) tésl’ar-a</td>
<td>*!</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

The fact that candidate (a) violates NONFINALITY is not crucial here, since, as we saw earlier in (47), the P stress pattern is predicted by the high ranking of faithfulness to the lack of stem stress of inherently stressless stems. Thus NONFINALITY is only crucial in
cases where a multisyllabic suffix receives stress by default as in (51); in that case, the suffixal stress is not final.20

2.4.3 Questions and Consequences

By relativizing DEP-STRESSSTEM to reflect stem position, we allow for a consequent relativization of MAX-STRESSSTEM as well. There is no effect of this relativization on the analysis proposed for Fixed stems in 2.2, where we considered only general MAX-STRESS. Since all Fixed stress in Ukrainian is stem stress, the constraint MAX-STRESSSTEM is satisfied by all candidates which satisfied general MAX-STRESS in 2.2; the same candidate which is optimal in (39) is optimal in (54):

(54) Fixed stress: /mular+y/ ‘mason’ nom.pl.

<table>
<thead>
<tr>
<th>/mular+y/</th>
<th>MAX-STRESS</th>
<th>MAX-STRESSSTEM</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>*w (a) múlar-y</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>(b) mulá-r-y</td>
<td>*!</td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>(c) mular-yí</td>
<td>*!</td>
<td>*!</td>
<td>*</td>
</tr>
<tr>
<td>(d) mular-y</td>
<td>*(!)</td>
<td>*(!)</td>
<td>*</td>
</tr>
</tbody>
</table>

(a) violates the constraint requiring rightmost stem stress, but this is lower ranked than MAX-STRESSSTEM, which all other potential candidates violate by changing input stress.

For Fixed stress, relativizing faithfulness to stem position makes no difference; the result is the same as for the analysis in 2.2 which considered only general MAX-STRESS.

But the inclusion of MAX-STRESSSTEM nevertheless has consequences for the Ukrainian grammar. The result is reflected in the analysis; specifically, I never show inherently

20 There are no suffixes of more than two syllables, so another possible solution is to propose a constraint
stressed inflectional affixes in Ukrainian in the tableaux. Given the OT principle of
Richness of the Base, there should be no language-particular restrictions on the input;
instead, restrictions should be derived by the ranking of surface-oriented (not input-
oriented) constraints. In fact, as long as we include Max-Stress\textsubscript{STEM} in our ranking, the
constraint ranking shows contrastiveness of stress, allowing us to restrict inputs and
exclude potential input forms with both inherent stem stress and inherent affix stress.

Recall that words in Ukrainian have a single most prominent accent, a requirement of
culminativity. As long as culminativity (more precisely, a set of constraints which ensure
culminativity) outranks faithfulness to stress, an input with more than one lexical stress
will never be realized on the surface. A form with only one prominence is most
harmonic as long as culminativity outranks faithfulness.

Now consider the possibility of two morphemes combining in the input, both with stress:
one stress on the stem, and one on the inflection, as in the tableau in (55) (candidates
shows only the syllable bearing stress). Culminativity eliminates a form with two heads on
the surface like (55) (a):

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|}
\hline
\& Stem Faith & & \\
\textit{\ldots x\textsubscript{stem} \ldots + x\textsubscript{affix}} & \textbf{CULMINATIVITY} & \textbf{MAX-STRESS\textsubscript{STEM}} & \textbf{MAX-STRESS} \\
\hline
(a) \ldots x\ldots -x & \textbf{\*!} & \textbf{\*!} & * \\
(b) \ldots x\ldots -x & \textbf{\*!} & * & * \\
(c) \ldots x\ldots -x & \textbf{\*!} & * & * \\
\hline
\end{tabular}
\caption{(55) Stem Faith}
\end{table}

Candidate (a) is eliminated by the requirement for culminativity, which is ranked higher
than faithfulness and is satisfied only by forms with a single stress. The elimination of

which specifies leftmost stress for suffixes, like Coincide-Leftmost (Stress, Suffix).
(b), the candidate with inflectional stress results from the violation of stem faithfulness. Both (b) and (c) violate general MAX, but (b) crucially violates the MAX-STRESS\text{STEM} constraint as well, by deleting stem stress. Thus MAX-STRESS\text{STEM} ensures that stem stress is always chosen over affixal stress. The inflectional stress will never arise on the surface, as long as MAX-STRESS\text{STEM} is included in our ranking.

Though an underlying form like (55), with stress on an affix and stem, is possible by the richness of the base principle in OT, we need not include it in our tableaux because it always neutralizes to the stem-stressed form. This is what McCarthy and Prince1993 call ‘Stampean occultation’, where an actually occurring form (the form with stem stress in this case) obscures or ‘occults’ a possible underlying form (the form with both stem and affix stress).

There is another possible input showing inherent suffix stress: an unstressed stem and stressed inflectional affix. But, like the example in (55), this hypothetical input is occulted by another form. It arises with surface stress on the affix, by the constraint ranking established in the previous section for P stems: DEP-STRESS\text{STEM} >> COINCIDE-R. (56) Affix stress

<table>
<thead>
<tr>
<th>/\ldots x_{stem} + x_{affix} /</th>
<th>DEP-STRESS\text{STEM}</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) \ldots \ddash x \ldash \ldots \ddash x</td>
<td>*!</td>
<td>*!</td>
</tr>
<tr>
<td>(b) \ldots \ddash x \ldash \ldots \ddash x</td>
<td>*!</td>
<td>*</td>
</tr>
<tr>
<td>(\ddash) (c) \ldots x \ldash \ldash</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

Candidate (c) is optimal by our constraint ranking, with stress realized on the inflectional affix: it is faithful to the input. But there is no need to posit such an input form, i.e. a form with an inherently stressed suffix. This is because the surface form of this input is
candidate (c), which is also the surface form derived from an input with an inherently unstressed affix and stem:

(57) Default affix stress

<table>
<thead>
<tr>
<th>/...x_stem... + x_affix/</th>
<th>DEP-STRESSSTEM</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) ...x...-x</td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>(b) ...x...-x</td>
<td>*!</td>
<td>*</td>
</tr>
<tr>
<td>(c) ...x...-x</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Our constraint ranking was established on the basis of input forms like (57), where both the stem and affix are inherently stressless. Candidate (c) is optimal because it inserts stress on the affix. This is the same surface form as in (56), where the input suffix is stressed. Thus there is no need for us to consider inherently stressed inflectional affixes in addition to unstressed ones; the surface form is the same in both cases.21

Having seen why there is no reason to posit inflectional affixes as stressed underlyingly, it is worth noting that the same does not hold for derivational affixes. Some derivational affixes in Slavic must be stressed underlyingly. Alderete 1999 proposes a system of “Anti-Faithfulness” constraints to account dominant suffixes like /úx/ in Russian, which appear stressed even when attached to a stressed stem (see Chapter 5 for details of Alderete’s AF system):

(58) Stressed derivational affixes (From Alderete 1999)

\[
\begin{align*}
/skak+úx+a/ & \rightarrow skak-úx-a \\
/s’iv+úx+a/ & \rightarrow s’iv-úx-a
\end{align*}
\]

The system proposed here allows for such affixes to be stressed in the input, as proposed by Alderete 1999. The problem of such derivational affixes in Russian is that they appear
to contradict the intrinsic ranking of \( \text{Faith}_{\text{Root}} >> \text{Faith}_{\text{Affix}} \) proposed by McCarthy and Prince 1995. This is why Alderete 1999 proposes a system of Anti-Faithfulness constraints to account for derivational Russian suffixes.

But the analysis proposed here allows for the patterning of dominant affixes like /úx/ to be predicted without contradicting the universal ranking of root and affix faithfulness, as long as these faithfulness constraints are ranked below the constraints we propose for P stress. Specifically, the dominant affixes here are part of the stem predicted by a constraint ranking which crucially includes Coincide-Right\textsuperscript{22}:

\begin{align*}
(59) \quad \text{Dominant affix stress}
\end{align*}

\[
\begin{array}{|c|c|c|c|}
\hline
\text{Stem} & \text{CULMINATIVITY} & \text{MAX-STRESS}_{\text{STEM}} & \text{COINCIDE-R} \\
\hline
\text{C} \text{Stem} & \star ! & \star & \star ! \\
\text{Stem} & \star ! & \star & \star ! \\
\end{array}
\]

Unlike the inflectional affixes we have seen so far, a derivational affix like /úx/ can be posited as part of the stem (as Alderete 1999 suggests). Since the suffix is at the rightmost edge of the stem, its stress is realized as in (c), rather than the root stress.

Alderete 1999 also outlines other more complex cases of derivation which are beyond the scope of this dissertation; I do not propose to account for all of the derivational affixes in Russian, nor do I preclude a system of Anti-Faithfulness to account for those cases.

Alderete’s system likewise cannot be extended to inflectional stress in Russian; the

\textsuperscript{21} There is also no need to consider bisyllabic affixes with inherent stress on a different syllable; stress is restricted to initial position by \texttt{NONFINALITY} >> \texttt{MAX-STRESS}.

\textsuperscript{22} Thanks to Hubert Truckenbrodt for this suggestion.
problems encountered by Anti-Faithfulness in the inflectional realm of Slavic are outlined in Chapter 5. At least some of the derivational stress cases are predicted by the system proposed here, but the focus is on inflection, and I assume a division between inflection and derivation within the Ukrainian and Russian nominal stress paradigms.

I leave aside for now the question of dominant derivational suffixes in Slavic\(^\text{23}\), referring readers to OT solutions to the problems in Alderete 1999 and Revithiadou 1999. I base the analysis on what I consider clearly inflectional affixes: the markings for gender and number typically encountered in the paradigmatic organization of Ukrainian stems. For consequences of FAITH\text{STEM} constraints beyond inflectional paradigms in Ukrainian, and the typological predictions for other languages, readers are referred to Chapter 5.

There is one final note about the ranking which I have proposed for P stems, and the predictions it makes. In Ukrainian (and in Russian) P-stems never show stems with initial stress where there is a nominative singular form without inflection. This nominative singular always shows final stem stress in all P paradigms:

\[(60) \quad \text{Typical P-stem paradigm (disyllabic stem):}\]

<table>
<thead>
<tr>
<th>Case</th>
<th>SG</th>
<th>PL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominative</td>
<td>(\sigma \sigma)</td>
<td>(\sigma \sigma \bar{\sigma})</td>
</tr>
<tr>
<td>Genitive</td>
<td>(\sigma \sigma - \sigma)</td>
<td>(\sigma \sigma - \sigma)</td>
</tr>
<tr>
<td>Dative</td>
<td>(\sigma \sigma - \sigma)</td>
<td>(\sigma \sigma - \sigma)</td>
</tr>
<tr>
<td>Accusative</td>
<td>(\sigma \sigma - \sigma)</td>
<td>(\sigma \sigma - \sigma)</td>
</tr>
<tr>
<td>Instrumental</td>
<td>(\sigma \sigma - \sigma)</td>
<td>(\sigma \sigma - \sigma)</td>
</tr>
<tr>
<td>Locative</td>
<td>(\sigma \sigma - \sigma)</td>
<td>(\sigma \sigma - \sigma)</td>
</tr>
</tbody>
</table>

\(^{23}\) In this group, I also include affixes which are neither clearly derivational nor inflectional. For example, the Ukrainian diminutive /k/ requires stem stress in the singular for all stems (behaving like a derivational affix), but also assigns stress on plural inflectional endings if the stem is inherently unstressed (behaviour consistent with inflection).
The unattested paradigm is one with initial stress on the nominative singular and post-stem stress on the rest of the forms:

(61) Unattested “P” paradigm:

<table>
<thead>
<tr>
<th>Case</th>
<th>SG</th>
<th>PL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominative</td>
<td>σσ</td>
<td>σσ-ό</td>
</tr>
<tr>
<td>Genitive</td>
<td>σσ-ό</td>
<td>σσ-ό</td>
</tr>
<tr>
<td>Dative</td>
<td>σσ-ό</td>
<td>σσ-ό</td>
</tr>
<tr>
<td>Accusative</td>
<td>σσ</td>
<td>σσ-ό</td>
</tr>
<tr>
<td>Instrumental</td>
<td>σσ-ό</td>
<td>σσ-ό</td>
</tr>
<tr>
<td>Locative</td>
<td>σσ-ό</td>
<td>σσ-ό</td>
</tr>
</tbody>
</table>

The proposed ranking for Ukrainian P-stress predicts this. By including COINCIDE-RIGHT in our grammar, we have implied a lower ranked COINCIDE-LEFT (STRESS, STEM) constraint:

(62) \[ \text{DEP-STRESS}_{\text{STEM}} >> \text{COINCIDE-RIGHT} >> \text{COINCIDE-L} \]

By the above ranking, stem stress is avoided for unspecified stems. This results in inflectional stress where there is an inflectional ending, due to satisfaction of \( \text{DEP-STRESS}_{\text{STEM}} \):

(63) Unaffixed P form: Rightmost stress

\[ /\text{tesl’ar}/ \text{‘carpenter’ nom.sg.} \]

<table>
<thead>
<tr>
<th>/tesl’ar/</th>
<th>DEP-STRESS\text{STEM}</th>
<th>COINCIDE-R (STRESS, STEM)</th>
<th>COINCIDE-L (STRESS, STEM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) těsl’ár</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b) tésl’ar</td>
<td>*</td>
<td>*!</td>
<td>*</td>
</tr>
</tbody>
</table>

Candidate (a) is optimal because where there is no overt inflectional ending, as in the example in (63), the rightmost edge of the stem is stressed.
2.5 SUMMARY

The constraint ranking established in this chapter accounts for Fixed and Post-stem stress in inflectional paradigms in Ukrainian; the crucial constraints for the analysis are ranked as follows:

(64) \[
\text{HEAD} \\
\text{DEP-STRESS}_{\text{STEM}} \quad \text{MAX-STRESS}_{\text{STEM}} \\
\text{COINCIDE-R (Stress, stem)} \\
\text{NONFINALITY,} \quad \text{COINCIDE-L (Stress, stem)}
\]

The ranking of all constraints proposed thus far for Ukrainian is:

(65) \[
\text{HEAD} \quad \text{CULMINATIVITY} \quad \text{MAX-STRESS}_{\text{STEM}, \text{NO-FLOP}} \\
\text{DEP-STRESS} \quad \text{DEP-STRESS}_{\text{STEM}} \\
\text{COINCIDE-R (Stress, stem)} \\
\text{NONFINALITY,} \quad \text{COINCIDE-L (Stress, stem)}
\]

Note: General MAX-STRESS is unranked if the stem-specific version is included in the ranking.

In Chapter 5, this ranking will be extended to Russian, without any modification, because the same Fixed and Post-stem patterns exist in Russian as in Ukrainian. Mobile stress is
where the difference between Russian and Ukrainian nominal stress lies, and Mobile stress is the topic of the next two chapters.
Chapter 3

Mobile Stress: Theory and Analysis

3.1 INTRODUCTION AND BACKGROUND

The core part of the analysis for Post-stem stressing stems in Chapter 2 is based on the differentiation of stem faithfulness, so that a stem which is unstressed in the input remains unstressed in the output by DEP-STRESSSTEM. This means that inherently stressless stems show inflectional stress throughout the inflectional paradigm of a P stem. But there are also stems that show inflectional stress in only part of the paradigm, either in the singular or in the plural sub-paradigm; the other part of the paradigm shows stem stress. The proposal here is that all of these Mobile stress patterns are a result of inherent lack of stress ‘gone awry’ because of a particular form in the paradigm. An example of such a form is the genitive plural form (shown in bold) for the stem /sél/ ‘village’ in (66):

(66) 2nd declension neuter
/sél/ ‘village’

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sg</td>
<td>sel-ó</td>
<td>sel-ú</td>
<td>sel-ó</td>
<td>sel-óm</td>
<td>sel-í</td>
<td>sel-ó</td>
</tr>
<tr>
<td>Pl</td>
<td>sél-a</td>
<td>sél-am</td>
<td>sél-a</td>
<td>sél-amy</td>
<td>sél-ax</td>
<td>sél-a</td>
</tr>
</tbody>
</table>

A form like the unaffixed genitive plural in the plural sub-paradigm of /sél/ influences other forms in the plural to have stem stress. (The change in the vowel quality in the
genitive plural is a change that affects a particular class of stems, and we will see this particular change and it relation to stress in detail in Chapter 4. The vowel change does not affect stress in this particular paradigm.) The next two sections consider the theoretical basis for positing a form as a base form for other paradigmatically related forms; these sections outline assumptions and constraints for the analysis of Mobile stems in Ukrainian.

3.2 Faithfulness Constraints and Levels of Correspondence

As noted in Chapter 2, the general framework adopted here is Correspondence theory (Benua 1997, McCarthy and Prince 1995, 1999). McCarthy and Prince 1995 established Input Output (I-O) and Base-Reduplicant (B-R) correspondence; Benua’s 1997 Transderivational Correspondence Theory (TCT) extends correspondence to not only I-O, but also Output-Output (O-O) strings. In TCT, a base is related to a derived surface form by correspondence; this base can influence the derived form so that the two forms resemble each other on the surface. O-O faithfulness constraints ensure that the two forms are similar and resist alternation within the paradigm, resulting in paradigmatic uniformity. There are other OT theories (e.g. Burzio 1994, 1996, 1998, Kenstowicz 1996, 1997) which derive similarity effects between morphologically related words; discussion of different theories follows in section 3.5. I lay out the main assumptions for this proposal below within TCT.

In work concerning paradigmatic uniformity, the standard kinds of correspondences that have been examined involve segmental faithfulness at output levels. The correspondence
relations we have seen so far have had to do with input-output relations. But the
definition of correspondence is general, and leaves open other options. Below I repeat the
general definition of Correspondence from Chapter 2:

(67) Correspondence (McCarthy and Prince 1995, 1997)
    Given two strings $S_1$ and $S_2$, correspondence is a relation $\mathcal{R}$ from the elements of $S_1$ to
    those of $S_2$. Elements of $\alpha \in S_1$ and $\beta \in S_2$ are referred to as correspondents of one
    another when $\alpha \mathcal{R} \beta$.

So far we have seen $S_1$ as the input string, and $S_2$ as an output string. But we can relate
output forms to each other by specifying that both $S_1$ and $S_2$ are output strings. Then two
output forms can correspond to each other; we need only specify that Output-Output is
the level at which we wish faithfulness to apply.

Since we are concerned with stress alternations, let us assume that the correspondence
relation between a pair of outputs can be extended to stress. In Chapter 2, we saw
faithfulness constraints for stress at the I-O level: ‘MAX-STRESS’ and ‘DEP-STRESS’.
These faithfulness constraints refer to the prosodic prominence or peak which is realized
on a segment:

(68)  MAX-STRESS: For $x$ stress, $\forall x \exists x' [x \in S_1 \rightarrow x' \in S_2 \& x \mathcal{R} x']$
    Every stress prominence in $S_1$ must have a correspondent in $S_2$.

(69)  DEP-STRESS: For $x$ stress, $\forall x \exists x' [x \in S_2 \rightarrow x' \in S_1 \& x \mathcal{R} x']$
    Every stress prominence in $S_2$ must have a correspondent in $S_1$.

Alderete 1999 notes that these constraints\(^24\) are active not only at the I-O level but also
the O-O level By stating that both strings $S_1$ and $S_2$ are output-level strings, we extend

\(^{24}\) Recall that Alderete 1999 has different constraint names: Max-Prom and Dep-Prom for ‘Prominence.’
faithfulness from the input-output level to faithfulness to stress prominence at the output-output level.

Kager 2000 also extends faithfulness to stress. He proposes the constraints below relate stress in a base and its derived word (where B=Output Base, O=Output Derived form):

(70) Base-Output Faithfulness according to Kager 2000

(a) PK-MAX (B/O)
Let \( \alpha \) be a segment in B and \( \beta \) be its correspondent in O.
If \( \alpha \) is the stress peak of B, then \( \beta \) is the stress peak of O.

(b) PK-DEP (B/O)
Let \( \alpha \) be a segment in O and \( \beta \) be its correspondent in B.
If \( \alpha \) is the stress peak of O, then \( \beta \) is the stress peak of B.

Note that Kager explicitly refers to a base (B) and output (O) derived form, rather than general \( S_1 \) and \( S_2 \) output-level strings. In this proposal, we will only refer to the O-O level in general. How we distinguish the two strings is a matter we will discuss in the next section.

Just as faithfulness constraints which refer to stress are applied at both I-O and O-O levels, the constraint Head-Dep in (71), proposed by Alderete 1995 as an I-O constraint, is extended in this proposal to the O-O level. The I-O constraint as proposed by Alderete 1995 is:

(71) Head-Dependence (Alderete 1995)
Every segment contained in a prosodic head in \( S_2 \) has a correspondent in \( S_1 \).
If \( \beta \) is contained in a prosodic head in \( S_2 \), then \( \beta \in \text{Range}(\mathcal{R}) \).\(^{25}\)

\(^{25}\) Recall from (67) that \( \mathcal{R} \) is the correspondence relation from the elements of \( S_1 \) to those of \( S_2 \).
Alderete thus extends the application of faithfulness to metrically strong positions, requiring correspondence between segments so that the segment which is the peak of the S₂ string has a correspondent segment in S₁. Note that the segment in S₁ is not necessarily a prominence-bearing segment; it need only be a segment which corresponds to the segment in S₁. In Alderete 1995, this punishes epenthetic vowels, and precludes them from being heads.

We will use the constraint differently in this chapter, since we will first consider the O-O effects of the constraint in Mobile stress. (In particular, the O-O version will not punish epenthetic vowels as in Alderete 1995, but vowels in inflected endings not present in the base.) Readers may notice that we have not yet seen Head-Dep as given in (71) active in Ukrainian at the I-O level, whereas we saw the faithfulness to stress constraints active in Chapter 2. We will see below in 3.4 that Head-Dep is active at the O-O level; in Chapter 5, I also show that the constraint is active at the I-O level.

The extension of the DEP constraint in (71) to the O-O level is crucial in this analysis. This differs from Alderete 1999, where only Max, and not Dep, is important at the O-O level, and from Alderete 1995, were Head-Dep is an I-O constraint, and not an O-O constraint. I propose that head faithfulness acts at the O-O, as well as the I-O, level in Ukrainian stress systems (similarly for Russian, as we will see in Chapter 5). A precise formulation of which output forms can correspond to each other is given below in section 3.4.
Since we extend the correspondence relation to stress so that correspondence of stress holds between two output strings, we should carefully consider the relationship between the two strings. The model which I assume here is Benua’s TCT, although there is a practical difference between TCT and my theory in the definition and implementation of ‘Base’. In TCT, there is a hierarchy of the harmonic evaluation of forms; the principle of Base Priority ensures that a base form is evaluated first, followed by the derived forms. This is because TCT’s main area of concern is derivationally related forms; thus is it not surprising that the related output strings are a base and its derivative.

But our concern is inflectional paradigms; the forms we need to predict are inflectionally related forms, not derivationally related ones. Other theories of paradigmatic uniformity (e.g. Kenstowicz 1996, Burzio 1994, McCarthy 2001) do not follow the kind of base-derivative relationship established in TCT to account for forms in inflectional paradigms. Specifically, these models allow for a symmetrical relationship between forms within a paradigm so that there is no ‘base’ which has priority; instead the entire paradigm is considered as a whole. McCarthy 2001 especially deals only with inflectionally related forms. For now, I will assume a TCT model of base priority, and will discuss the other theories and differences between these in section 3.7 and Chapter 4.

Assuming TCT, for our definitions of faithfulness above, $S_1$ is the base and $S_2$ the derived form. As mentioned, this proposal differs from the general interpretation of Benua’s TCT model in terms of what constitutes a ‘base’: the form in the paradigm which has privileged status and around which all other forms regularize. Benua 1997 writes: “often,
the base is the word that is minimally less morphologically complex than the derived word, so that the base consists of a subset of the derived word’s morphemes. But this kind of subset relation does not always hold (29).” I claim that the case at hand is an example of where this morphological subset relation does not hold, where a base is neither morphologically nor semantically less complex than its derived form. The base need not be simpler in terms of its meaning or component parts.

Thus a base here means a phonological base but not a semantic base; form and function are separate.26 By separating the semantic and morpho-phonological components of basehood, we do not expect the complexity of one component to match the other. But it is also not the case that the forms considered here are unrelated; they are members of the same paradigm. Section 3.4 discusses the notion of paradigm and formalizes the relationship between two paradigmatically related forms.

3.3 THE PARADIGM

‘There is a feeling amongst many linguists that the notion of paradigm must be important, perhaps even in some sense primary. But it has proved extremely difficult to characterize the idea adequately, let alone give it a formal definition, and in most contemporary theories of morphology the notion of ‘paradigm’ doesn’t play a role.”

Spencer 1991 (p.12)

---

26 For arguments that the relation between morphological form and morphosyntactic function is not one-one, see Word-and-Paradigm approaches to inflectional morphology (cf. Robins 1959, Matthews 1972), and for separation of form and function for both inflectional and derivational affixes, the Separation Hypothesis model (cf. Beard 1976).
3.3.1 The notion ‘paradigm’

The notion of paradigm plays a role in this proposal; it helps characterize the relationship between a base and the related forms which show stem stress in the Mobile stress pattern in Ukrainian. Spencer 1999 proposes the informal definition for a paradigm below:

(72) Paradigm: informal definition (Spencer:11)  
“A paradigm is the set of all the infected forms which an individual word assumes.”

According to Spencer, the term paradigm also sometimes ‘refers to some specifiable subpart of the total paradigm’ like ‘the singular paradigm’. The analysis proposed here crucially separates the total paradigm into the two sub-paradigms for singular and plural (with some additional divisions according to case addressed in Chapter 4).

There is independent evidence for this particular singular vs. plural split in many languages, including the East Slavic languages. For example, in Ukrainian and Russian, gender distinctions present in the singular forms of pronouns, adjectives, and numerals are lost in the plural. Singular forms can be masculine, feminine, or neuter, but there is no specific gender in the plural. The examples below, mentioned previously in Chapter 1, show no distinctions for gender in the plural Ukrainian pronouns:

(73) Ukrainian 3rd person nominative pronoun : /von/

<table>
<thead>
<tr>
<th>Masculine</th>
<th>Singular</th>
<th>Plural</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>vin</td>
<td>voni</td>
</tr>
<tr>
<td>Feminine</td>
<td>vona</td>
<td>voni</td>
</tr>
<tr>
<td>Neuter</td>
<td>vono</td>
<td>voni</td>
</tr>
</tbody>
</table>
The neutralization of gender distinctions in the plural as in the above example also extends to pluralia tantum nouns. As mentioned in Chapter 1, these are the nouns used only in the plural. In Ukrainian and Russian, these nouns have no gender. A few Ukrainian examples are: [driʒdi] ‘yeast’, [ɦiroʃi] ‘money’, [dveri] ‘door’; [fiust] ‘geese’\(^{27}\). There are also nouns used only in the singular in Ukrainian; these nouns do show gender: [tsefilə] ‘brick (fem.)’; [vino] ‘wine (neut.)’; [fiaz] ‘gas (masc.)’; [molod]’ ‘youth (fem.)’ [vrodá] ‘appearance/ beauty (fem)’.

Thus the separation of singular and plural nominal paradigms in this analysis is not a new or radical notion; it is a characteristic of the East Slavic grammar. This separation is important when we consider Mobile stem stress in particular, because here we most often see contrasts in stress position between singular and plural number paradigms. (Rather than stress cutting across number and shifting according to case, for example.) Therefore, I present the inflectional paradigms for stems with separate singular and plural sub-paradigms in order to reinforce this claim, as for the stem /sl/ (given in (66) and repeated below:

\(^{27}\) There is no plain singular counterpart to [hus-ı]: *[hus-a]. The noun ‘one goose’ is formed by adding diminutive [–ka] to the root: [hus-ka].
Having separated paradigms according to number, consider that each sub-paradigm can be listed as a set consisting of input stem members with phonological representations and morpho-syntactic features. As an example, consider the set of input singular forms for the stem /sel/, set $S_{SG}$:

$S_{SG} = \{/{\text{sel-o}}/ (\text{nom.sg.}); /{\text{sel-a}}/ (\text{gen.sg.}); /{\text{sel-u}}/ (\text{dat.sg.}); /{\text{sel-o}}/ (\text{acc.sg.}); /{\text{sel-om}}/ (\text{instr.sg.}); /{\text{sel-i}}/ (\text{loc.sg.}); /{\text{sel-o}}/ (\text{voc.sg.})\}$

The above set $S$ is the set of all inflected input forms of the noun /sel/ for the singular paradigm.

The input forms which make up the set of the plural sub-paradigm are:

$S_{PL} = \{/{\text{sel-a}}/ (\text{nom.pl.}); /{\text{sil}}/ (\text{gen.pl.}); /{\text{sel-am}}/ (\text{dat.pl.}); /{\text{sel-a}}/ (\text{acc.pl.}); /{\text{sel-amy}}/ (\text{instr.pl.}); /{\text{sel-ax}}/ (\text{loc.pl.}); /{\text{sel-a}}/ (\text{voc.pl.})\}$

The total set $T$ of all input forms is thus the union of sets $S_{SG}$ and $S_{PL}$:

$T = S_{SG} \cup S_{PL} = \{x: \forall (x \in A, x \in B)\} = \{/{\text{sel-o}}/ (\text{nom.sg.}); /{\text{sel-a}}/ (\text{gen.sg.}); /{\text{sel-u}}/ (\text{dat.sg.}); /{\text{sel-o}}/ (\text{acc.sg.}); /{\text{sel-om}}/ (\text{instr.sg.}); /{\text{sel-i}}/ (\text{loc.sg.}); /{\text{sel-o}}/ (\text{voc.sg.}); /{\text{sel-a}}/ (\text{nom.pl.});$
This is the set of input forms for the whole inflectional paradigm of the stem /sil/. Since we are concerned with the difference between singular and plural stress, we will refer to the singular sub-paradigm set of forms $S_{SG}$ and the plural set $S_{Pl}$, rather than the Total set.

### 3.3.2 Characteristics of a paradigm

For our purposes it is also useful to describe certain characteristics of a paradigm which are reflected in the division of stems into declension classes; specifically, we are interested in whether there are forms with zero endings in the paradigm. I repeat the division of stems according to membership in a declension class given in Chapter 1 below. We see the stems which allow M1 or M2 stress are 1st declension feminine and masculine stems, and 2nd declension neuter stems.

(78) **Stress and Declension type**

<table>
<thead>
<tr>
<th>Declension</th>
<th>Gender</th>
<th>Nom. Sg.</th>
<th>Gen. Pl.</th>
<th>Stress Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>Fem. &amp; Masc.</td>
<td>-a</td>
<td>-∅</td>
<td>F, M1, M2</td>
</tr>
<tr>
<td>2nd</td>
<td>Neuter</td>
<td>-o or -e</td>
<td>-∅</td>
<td>F, M1</td>
</tr>
<tr>
<td></td>
<td>Masculine</td>
<td>-∅</td>
<td>-iv</td>
<td>F, P, M3</td>
</tr>
<tr>
<td>3rd</td>
<td>Feminine</td>
<td>-∅</td>
<td>-ej</td>
<td>F</td>
</tr>
</tbody>
</table>

As Spencer writes: “inflectional systems often respect paradigm structure conditions (PSC). These are implicative regularities of the kind ‘if a member of the paradigm has
affix x in the genitive then it has affix y in the dative’” (226). Ukrainian stems which exhibit the mobile pattern M1 are characterized by [-e] or [-o] suffixes (for 2nd declension) or [-a] suffix (1st declension) in the nominative singular (cf. (78) above).

Most importantly for the analysis presented here, all of these stems are also characterized by having no ending in the genitive plural. The PSC of Ukrainian nouns is the biconditional that the [-o], [-e] or [-a] suffix in the nominative singular implies no suffix in the genitive plural, and vice versa.

The stem showing this biconditional are also the only stems which can have Mobile stress patterns M1 and M2, where stress is on the stem in the plural sub-paradigm. The only other stems that have no genitive plural ending show Fixed stress; those stems are specified for stress underlingly. When stems are unspecified for stress, and show no overt inflection in one form of the plural, they arise with Mobile stem stress in the plural: patterns M1 and M2. (Together, there are 203 such stems with stem stress in the plural.)

Stems showing the M3 pattern (there are 223 such stems) also have an unaffixed form in the paradigm, but in this case in the singular sub-paradigm. And it is in the singular that M3 shows stem stress; the plural sub-paradigm shows stress on inflectional endings. The important characteristic of the paradigm is the overtly uninflected form; its place in the paradigm determines where the stem stress will surface. Let us consider how to isolate this particular form from other related forms in the inflectional paradigm.
3.3.3 Sets of Difference

The characterization of the M1 stems as having no genitive plural is formalized in this section. Specifically, the set of plural forms with **overt** affixes lacks the genitive plural, which has no overt affix. The set in (79) is the set of overtly suffixed plural forms for the stem /krasot/ ‘beauty’, where ‘O’ includes only forms with overt affixes:

\[
(79) \quad \text{O}_{\text{PL}} = \{ \text{krasot-y (nom.pl.); krasot-am (dat.pl.); krasot-y (acc.pl.); krasot-amy (instr.pl.); krasot-ax (loc.pl.); krasot-y (voc.pl.)} \}
\]

There is no genitive plural form in the set in (79) because the set O_{PL} includes only those forms with overt affixes, and the genitive plural has no affix. Compare the set O_{PL}, the set of all overtly affixed plural forms, with that of all plural forms, set S_{PL}:

\[
(80) \quad \text{S}_{\text{PL}} = \{ \text{krasot-y (nom.pl.); krasot (gen.pl.); krasot-am (dat.pl.); krasot-y (acc.pl.); krasot-amy (instr.pl.); krasot-ax (loc.pl.); krasot-y (voc.pl.)} \}
\]

The set in (80) includes the genitive plural form. The contrast between the members in the two plural sets above does not hold in the singular; the singular set of all forms is:

\[
(81) \quad \text{S}_{\text{SG}} = \{ \text{krasot-a (nom.sg.); krasot-y (gen.sg.); krasot-i (dat.sg.); krasot-u (acc.sg.); krasot-oju (instr.sg.); krasot-i (loc.sg.); krasot-o (voc.sg.)} \}
\]

The set of overtly affixed forms O_{SG} shows the same members of the set as the set S_{SG} above:

\[
(82) \quad \text{O}_{\text{SG}} = \{ \text{krasot-a (nom.sg.); krasot-y (gen.sg.); krasot-i (dat.sg.); krasot-u (acc.sg.); krasot-oju (instr.sg.); krasot-i (loc.sg.); krasot-o (voc.sg.)} \}
\]

Since there are no singular forms without affixes in the singular paradigm, the sets S_{SG} and O_{SG} are identical.
But the sets for the plural sub-paradigm are not. The set difference of the sets $S_{PL}$ and $O_{PL}$ shows us the form which is not present in the set of overtly inflected forms, the genitive plural:

$$(83) \quad S_{PL} - O_{PL} = \{ x : x \in S_{PL}, x \notin O_{PL} \} = \{ \text{krasot (gen.pl.)} \}$$

The unaffixed form is thus isolated by the set difference in (83); this is a formal way of distinguishing a characteristic of the M1 stems: the unaffixed member which serves as the base for stress assignment in the rest of the plural sub-paradigm.

By contrast, the set difference is an empty set for the singular for the stem /krasot/:

$$(84) \quad S_{SG} - O_{SG} = \{ x : x \in S_{SG}, x \notin O_{SG} \} = \emptyset$$

Since there is no unaffixed form in the singular sub-paradigm, there is no form distinguished by the set difference in (84); only forms without affixes are part of the set difference.

It is also possible to have more than one form in the set which distinguishes unaffixed forms. For example, the stem /kraj/ ‘land’ in Ukrainian has nominative singular and accusative singular forms without affixes; thus both these forms are members of the singular set difference (which is the set of all forms less the overtly marked forms):

$$(85) \quad S_{SG} - O_{SG} = \{ x : x \in S_{SG}, x \notin O_{SG} \} = \{ \text{kraj (nom.sg.), kraj (acc.sg.)} \}$$
Thus a set difference is not restricted to one form; it is possible to have more than one member of a set difference. However, note that the two members in the set above are phonologically identical. This is because unaffixed forms for stems unspecified for stress always arise with stress on the right edge in Ukrainian; by Coincide-Right, the default position of stress for an inherently stressless stem is rightmost. The constraint ranking in Ukrainian precludes any difference in phonology between overtly uninflected forms within a noun’s inflectional paradigm. Therefore, even if we have more than one form in the set difference, the phonological surface forms of these are identical. This will be important when we refer to a single form as a potential base for stress in other related forms. The surface forms identified by a set difference will always be the same, and will exert the same influence: stem stress.

3.4 O-O FAITH IN INFLECTIONAL PARADIGMS

Having distinguished unaffixed forms in an inflectional paradigm by the set difference method illustrated in 3.4.3, consider a formal definition of a Base form. I have assumed the following:

(86) Assumptions
Let \( S_{pl} \) be the set of all inflected plural forms for the stem \( x \).
Let \( S_{sg} \) be the set of all inflected singular forms for the stem \( x \).
Let \( O_{pl} \) be the set of all overtly inflected plural forms for the stem \( x \).
Let \( O_{sg} \) be the set of all overtly inflected plural forms for the stem \( x \).

Now, let us refer to any member of the set difference; let us call this member \( z \) (where \( z = \) zero or affixless form). Where \( y \) is either singular or plural, if the complement of \( O_y - S_y \) is an empty set, there is no member \( z \). If the set is not an empty set, i.e. if \( O_y - X_y \) is a set with a member \( z \), then \( z \) is the base for other members of the sub-paradigm \( y \).
A formal way of defining the relationship between $z$ and other members of the sub-paradigm is to show exactly which output strings stand in correspondence as below\(^{28}\), where I give more specific details about the output strings. First I give the general definition of correspondence repeated from (67) above, and then the specific output strings which identify this particular Ukrainian relation.

(87) Correspondence: definition (McCarthy and Prince 1995, 1999)
Given two strings $S_1$ and $S_2$, correspondence is a relation $\mathcal{R}$ from the elements of $S_1$ to those of $S_2$. Elements of $\alpha \in S_1$ and $\beta \in S_2$ are referred to as correspondents of one another when $\alpha \mathcal{R} \beta$.

Ukrainian nominal stress correspondence is thus described as:

(88) $z \mathcal{R} x$ IFF:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>$z$ is an output member of $S_1$</td>
<td>‘Base’</td>
</tr>
<tr>
<td>$S_1 = (S_y - O_y)$</td>
<td>set difference</td>
</tr>
<tr>
<td>$x$ is an output member of $S_2$</td>
<td>‘Derivative’</td>
</tr>
<tr>
<td>$S_2 = S_y$</td>
<td>set of inflected forms in sub-paradigm</td>
</tr>
</tbody>
</table>

The correspondence relation between $z$ and $x$ in (88) means that for all such forms $z$, $x$ which stand in correspondence, $z$ is a member of the set difference $(S_y - O_y)$ and $x$ is a member of the set $S_y$. For example, for the stem /krasot/ ‘beauty’ the set difference $S_{PL} - S_{SG}$ isolates the overtly uninflected form in (83), /krasot/ ‘beauty, gen.pl.’ as the base. This form stands in correspondence to $S_{PL}$ derivatives, the forms in the plural sub-paradigm.

Note that all forms in the set difference $S_y - O_y$ and the set $S_y$ can stand in correspondence, so if there are two members of the set difference, they can both act as base forms (recall

\(^{28}\) Thanks to Bruce Tesar for this suggestion.
from above that this will mean the same result since the forms are identical). Also, I give the general set of all members of the paradigm $S_Y$ as correspondents (i.e. potential derivatives), so this means that a base could stand in correspondence to itself. This causes no problems for our analysis. If for some reason we wished to avoid this possibility, we need only specify that the correspondence string $S_2$ is not a string from the set of all paradigm members $S_Y$, but only from the set $O_Y$, the set of overtly marked forms.

The unaffixed base form, captured by the set difference relation outlined above, triggers base-derivative effects in the rest of the sub-paradigm. The next section shows the result for M1 stems in Ukrainian.

3.5 O-O FAITH IN ACTION

In the Ukrainian M1 group, consisting of 171 stems, the genitive plural stress is realized on the rightmost edge because there is no inflectional ending to bear stress. This is predicted by our system without O-O constraints, by the constraint ranking established in Chapter 2. Recall that the genitive plural form is the only overtly unaffixed form in the paradigm; it is also the only member of the set difference for this stem:

$$\text{(89) Set difference for } /\text{krasot}/ \\
S_{PL} - O_{PL} = \{ x : x \in S_{PL}, x \notin O_{PL} \} \\
= \{ \text{krasot (gen.pl.)} \}$$

Below I illustrate that rightmost default stress is assigned to the potential base form /krasot/ 'beauty gen.pl.' by our constraints thus far:
Since all words in Ukrainian must bear stress, candidate (90)(c) is eliminated because it does not, violating Headedness. Stress must be assigned to the stem, as (a) and (b), because there is no inflectional ending in the genitive plural. The only choice is where the stem stress is assigned. The genitive plural surfaces with rightmost stress; candidate (a) is optimal because it satisfies COINCIDE-R. Stress assignment as illustrated in (90) establishes that the surface form which serves as a potential base for correspondence with the rest of the plural forms in the plural sub-paradigm is [krasót].

The relation of potential base and derivative correspondents in (88) can now be applied to a constraint relating the forms. The constraint HEAD-DEP proposed by Alderete 1995, and given in (71), is extended to the O-O level. The Output-Output constraint below acts on the base \( z \) and correspondent derivative forms \( x \):

(91) \[ \text{OO-Dep}_{\text{Hd}} \]

Every segment contained in a prosodic head in \( S_2 \) has a correspondent in \( S_1 \).
If \( \beta \) is contained in a prosodic head in \( S_2 \), then \( \beta \in \text{Range}(91) \).

---

29 Since this constraint refers to segments contained in a prosodic head, I modify Alderete’s labeling slightly and represent the constraint with ‘Head’ as a subscript: \( \text{DEP}_{\text{Hd}} \) (Alderete uses the short form HEAD-DEP as we saw in (4)). Thanks to Hubert Truckenbrodt for this suggestion. This representation shows the relevant environment for DEP is the prosodic head, just as we noted the stem position for DEP in the constraint \( \text{DEP-STRESS}_{\text{STEM}} \). This labeling also makes it clear that \( \text{DEP}_{\text{Hd}} \) does not, unlike DEP-STRESS, refer to correspondent stress prominences. Instead, as it clear in the definition above, \( \text{DEP}_{\text{Hd}} \) defines correspondent segments.
This O-O constraint requires that only segments with base correspondents can be in prosodic head position in the derivative.

The motivation for OO-DEPHD is explained in Chapter 4: it is the only O-O constraint that allows us to predict all the patterns. By satisfying OO-DEPHD, the other forms of the plural take the genitive plural as the base for stress assignment; this is the stress around which the rest of the plural paradigm must correspond. Tableau (92) shows the derivation of the nominative plural form for the stem /krasot/. The base established in (90) is given in the first column.

(92)  \textit{OO-Faith: Derivative} [krasoty] nom.pl.

<table>
<thead>
<tr>
<th>Base</th>
<th>/krasot+y/</th>
<th>OO-DEPHD</th>
<th>DEP-STRESSSTEM</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>krasót</td>
<td>krasót-y</td>
<td>*!</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b) krasót</td>
<td>krasot-ý</td>
<td>*</td>
<td>*</td>
<td>*!</td>
</tr>
<tr>
<td>(c) krasót</td>
<td>krásot-y</td>
<td>*</td>
<td>*</td>
<td>*!</td>
</tr>
</tbody>
</table>

OO-DEPHD ensures that every head segment in the derivative has a correspondent in the base. Note that without an O-O constraint like OO-DEPHD, we would expect (b) to be the optimal candidate, but it is eliminated by OO-DEPHD. Candidate (b) inserts stress onto a segment which has no correspondent in the base, the inflectional affix; thus (b) crucially violates OO-DEPHD. By contrast, both (a) and (c) are faithful to OO-DEPHD, with stressed segments that are present in the base. Both (a) and (c) violate DEP-STRESSSTEM. But (c) crucially violates COINCIDE-R, so (a) is the optimal candidate.
3.6 SUMMARY

In this section, we saw that the O-O constraint \( O\!O\!-\!D\!E\!P_{HD} \), added to our ranking established thus far, predicts the M1 pattern:

\[
\begin{array}{c}
\text{HEAD} \\
\text{OO-DEP}_{HD} \\
\text{DEP-STRESS}_{STEM} \\
\text{COINCIDE-R (STRESS, STEM)}
\end{array}
\]

\( OO\!-\!DEP_{HD} \gg DEP\!-\!STRESS_{STEM} \) is the crucial ranking which ensures that stems unspecified for stress may receive stem stress \( iff \) a form in the paradigm triggers the O-O correspondence relation described in section 3.4.

The base in the example M1 case in this chapter is the genitive of the plural inflectional paradigm of 1\textsuperscript{st} and 2\textsuperscript{nd} declension stems. One might wonder about the frequency of the occurrence of the genitive plural, questions may arise as to its accessibility to learners. But the genitive plural is not a base by virtue of being the genitive, but because it is the only form in the paradigm which has no overt ending. The learner has access to the types of endings for each stem, and where the genitive plural is marked by virtue of not having an overt ending\(^{30}\), that stem is marked for mobile stress assignment. It is important for the learner that 1\textsuperscript{st} and 2\textsuperscript{nd} declension stems have this marked form: an overtly uninflected

\(^{30}\)One might argue that an overtly uninflected genitive plural is more marked than, for example, the unaffixed nominative singular forms which we see in pattern M3 (ie. that it is not as surprising to see a
form in the plural subparadigm. That form happens to be the genitive; it is not important that this form is the genitive.

Thus the base form is established by virtue of its lacking overt inflection, and corresponds to derivative forms. The constraint ranking $OO-\text{DEP}_{HD} >> \text{DEP-STRESS}_{STEM}$ explains stem stress in derivative forms where there is an inflectional suffix, i.e. where we would otherwise expect inflectional rather than stem stress by our system in Chapter 2. The facts of the preceding analysis for M1 stress can be summarized as follows:

(94) Summary of M1 stress

i. The stem does not have lexically specified stress.

ii. A form without overt inflection exists within a sub-paradigm of the stem, in this case the plural. This is the base form. It acquires regular stress by the system of constraints previously outlined in Chapter 2 specifically: $\text{COINCIDE-R}$ drives final stem stress.

iii. $OO$ correspondence relates the base form and its stress to other members of the plural sub-paradigm; specifically, by the constraint $OO-\text{DEP}_{HD}$ which prevent stress insertion on a segment not present in the base form.

The proposal that a base is possible in an inflectional paradigm is grounded in certain phonological facts of Ukrainian paradigms, in particular, the importance of uninflected forms in the phonology of paradigms. Readers familiar with historic Slavic phonology will recognize the importance of the ‘zero’ inflectional ending for paradigm regularization. (See Appendix II for details about and historical reasons for the uninflected forms in Slavic.)
The careful reader may note that in our previous analysis of P stressing stems, P stems show forms without inflection in the singular paradigm but do not show O-O effects. In Chapter 4, we will see that other stems show the O-O constraint active in the singular paradigm; the result is the M3 pattern of stress. The O-O constraint must be restricted to particular (i.e. not all) singular stems by specification of the O-O constraint to stems with certain characteristics. Before moving to other more complex examples of Mobile stress, let us consider some other approaches to the realization of paradigmatic uniformity effects with respect to the Mobile stress pattern M1 and the analysis proposed here.

### 3.7 Other O-O Theories

There are two crucial points which must be addressed within any theory which attempts to apply an Output-Output model to inflectional paradigms. First, we must restrict the O-O constraints so that they accurately and precisely predict only the surface resemblances we desire. Attempting this leads to the second point: the relationship between related forms must be clearly defined. This begs an important question: are inflected forms bases? If our answer is yes, then we need to explain what constitutes a base form, as we did above in section 3.3, and what forms it relates to. If the answer is no, inflected forms cannot serve as bases, then we must turn to a symmetric approach to account for paradigmatic uniformity so that no special form is needed. As I show in section 3.7.3, such an approach can account for the stress facts presented here, but the phenomenon of Ukrainian inflectional stress does not provide evidence that such an approach is necessary.
3.7.1 Compositionality

The base in the present analysis is defined in terms of a set difference which identifies an uninflected form in an inflectional paradigm. This base corresponds to other related forms in the paradigm according to the definition in (88). At no time is the base required to be a semantically simplex version of the derived forms; any member of an inflectional paradigm qualifies as a potential base.

Contrast this assumption with the definition of a base assumed by Kager 1999:

(95)      Definition of ‘base’ (from Kager 1999):

a. The base is a free-standing output form -- a word
b. The base contains a subset of the grammatical features of the derived form.

The crucial difference between Kager’s proposal and mine is that I do not assume a compositional relationship between base and derivative as Kager does in (b). I do require that the base and derivative must be members of the same paradigm by (88), but I do not assume that the base must be a semantically simplex version of its derivative. What is important for our analysis is that the derived form is contained in the base by virtue of the base being uninflected; but the grammatical features of the base need not be contained in the derived form.

The distinction I make is important because it means that in Ukrainian Mobile stress patterns like M1, the zero form of the genitive plural in a plural paradigm can be a base for other members of the plural paradigm like the nominative plural. In a definition like Kager’s which assumes semantic compositionality, the genitive plural cannot serve as the
base; its grammatical features, specifically ‘genitive’, are not contained in the nominative plural form.

3.7.2 Base-Derivative TCT

In rejecting the idea that a base is always morphologically more simple than the derived word, the proposal does not run contra to TCT. Benua 1997 allows the possibility that a base not be a subset of the derived word so that inflected forms can be bases:

> In derivational systems, the base of a phonological relation typically consists of a subset of the morphemes that appear in the derived word…a subset relation may or may not hold…It is also plausible that the expectation of a subset relation between derived word and base is wrong, particularly in inflectional morphology (my italics). (Benua p.106).

This leaves the door open for non-compositional base-derivative relationships like the one proposed here here.

However, the present analysis stops short of some other relationships left open as possibilities by Benua, who also writes that “An obligatorily-inflected word can serve as the base of another inflected word, and the base’s inflection is neither morphologically nor phonologically present in the derived word (29).” Thus overtly inflected forms can act as bases for forms which do not have the same inflectional endings according to this statement. In the analysis presented here, I restrict base forms to those without overt inflection. Forms with overt inflection cannot serve as bases. Let us consider if this limits our account with respect to the arguments presented in Benua for such forms acting as bases.
As one example of OO faith with base forms with overt inflection, Benua 1997 cites Portuguese diminutives from Rainer 1995. Rainer suggests that the plural diminutive is derived from the regular plural, since the diminutive plural forms realize the vowel of the plural –*es* suffix:

(96)  Portuguese (from Rainer, 1995)

<table>
<thead>
<tr>
<th>Singular</th>
<th>Sg. Diminutive</th>
<th>Plural</th>
<th>Pl. Diminutive</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘dog’</td>
<td>cão</td>
<td>cãozinho</td>
<td>cães</td>
</tr>
<tr>
<td>‘flower’</td>
<td>flor</td>
<td>florzinha</td>
<td>flores</td>
</tr>
</tbody>
</table>

The sketch below shows the root /cão/ plus plural suffix resulting in the surface form [cães]; according to Benua, the suffixation of the plural -(e)s eliminates, or forces assimilation of, the root-final vowel: /cão+es/ → [cães]. This inflected form in turn influences the surface realization of the form for the root+diminutive+plural, so that the root-final /o/ is changed to [e] in the surface form [cãezinhos], even though the plural morpheme is not adjacent to the stem in the diminutive: /cão+zinho+es/ →* [cãozinhos].

Benua proposes OO-correspondence as outlined below:

(97)  Portuguese diminutives (from Benua 1997):

\[
\text{OO-correspondence}
\]

\[
\text{[cães]} \quad \rightarrow \quad \text{[cãezinhos]}
\]

\[
\uparrow \quad \quad \uparrow
\]

\[
/cão+es/ \quad \rightarrow \quad /cão+zinho+es/
\]
Benua writes that the base of the diminutive paradigm, inflected plural [cães], influences the plural diminutive derivative. Root vowel “assimilation” overapplies in the plural diminutive (the singular diminutive does not show assimilation: [cãozinho]).

As an alternative, I propose the OO effect in the plural-plural diminutive is that the plural is faithfully realized in the diminutive version, because the base and its derivative correspond as follows, for the example above:

(98)  
The set of all plural forms is: {cães, cãezinhos}.  
The set of plural forms with overt diminutive affixes is: {cãezinhos}  
The set difference is the plural form without diminutive affixation: {cães}.

The relationship in this case is the plural-diminutive plural; the new diminutive affix is applied to the diminutive plural forms:

(99)  
Portuguese plural diminutives

<table>
<thead>
<tr>
<th>Plural</th>
<th>Pl.Diminutive</th>
</tr>
</thead>
<tbody>
<tr>
<td>cães</td>
<td>cãezinhos</td>
</tr>
<tr>
<td>flores</td>
<td>florezinhos</td>
</tr>
</tbody>
</table>

This is the same relationship that we see for singular/diminutive forms; here, the base is again the form without the diminutive affix, the singular, and the diminutive differs only by its realization of a diminutive:

---

31 Note that we can restrict the possibilities of what forms correspond to one another by requiring that the set difference be one ‘step’, so that the Portuguese singular can be the base for the plural diminutive because this relationship is one of two set differences: the singular lacks the plural affix and the diminutive affix.
(100) Portuguese singular diminutives

<table>
<thead>
<tr>
<th>Singular</th>
<th>Sg. Diminutive</th>
</tr>
</thead>
<tbody>
<tr>
<td>cão</td>
<td>cãozinho</td>
</tr>
<tr>
<td>flor</td>
<td>florzinha</td>
</tr>
</tbody>
</table>

In this case, since there is no overt singular affix, there is no infixation of the diminutive. Neither is there any striking OO-effect; but the base-derivative relationship between non-diminutive and diminutive holds.

In the system we saw for Ukrainian stress, an overtly unmarked form influences related forms within its inflectional paradigm. In the above case of the Portuguese plural diminutives, the base lacks the diminutive affix, and so influences the diminutive form. In all cases, the lack of one particular affix is what distinguishes a base and allows it to correspond to its derivative. Thus, the analysis proposed here would allow for this type of O-O correspondence in Portuguese. What it would not allow, and what Benua’s proposal leaves open, is the influence of an overtly inflected form within a paradigm influencing a form without (or with less) inflection;32 the system I propose is more restrictive.

In our system, we have found a way of formalizing this generalization by set relations, specifically, by isolating the base by set difference between sets with affixes and those without. Therefore, this is a model which defines special status for a base form, and requires that base to have less affixation than its potential derivative. The base is in this

---

32Benua also cites a Polish example from Kraska-Szlenk 1995, where the genitive plural is again under scrutiny. The gen.pl. diminutive of the stem /krow/ ‘crow’ is unexpectedly [kruwek]; closed-syllable-raising overapplies. Benua follows Kraska-Szlenk in assuming that the genitive plural diminutive form is influenced by the nominative singular diminutive [kruw.ka], where closed-syllable-raising is expected. My system would assume a relationship where the genitive plural form influences the plural diminutive; this is an alternative analysis Benua also acknowledges (Ftn. 57, p. 108). Thus [kruw], with no overt agreement suffix, is the base for the diminutive gen.pl. [kruwek].
sense ‘contained’ like a stem is in its derivative. In the system proposed here, an inflected form would not be able to influence an overtly uninflected form; e.g. the nominative plural with inflection /krasótt/ does not influence the genitive plural /krasót/. In Benua’s system, the definition of basehood is left open; the overtly inflected form can influence another overtly uninflected form. Thus, although the base is privileged in TCT, there are many more potential bases than in the proposal here. The section below explores another alternative, the possibility of having no privileged base at all.

3.7.3 Optimal Paradigms

McCarthy (2001: 4) suggests that “TCT is not applicable to inflectional paradigms” because “The derived form…is obtained from the base by applying a morphological operation, such as affixation. Inflectional paradigms have no base in this sense.” McCarthy suggests that since all forms are overtly inflected within a paradigm, no form can act as a simplex base (although he notes Benua’s different view.) In our case, we have avoided this potential problem by allowing a base within an inflectional paradigm by virtue of its not having overt affixation. The base is not required to be a morphologically and semantically simplex form, rejecting a definition of compositionality to which some readers might be more accustomed (cf. the definition of a Base by Kager 2000 in (95) ). But the account I propose maintains base priority. Before discussing the difference between my proposal and McCarthy’s in more detail, I give a brief overview of accounts for inflectional paradigms in OT which precede McCarthy 2001.
There are other theories of paradigms and uniformity which do not require base prioritization. For example, another approach to O-O correspondence is the Uniform Exponence (UE) theory proposed by Kenstowicz 1996:

(101) Uniform Exponence

Minimize the differences in the realization of a lexical item (morpheme, stem, affix, word).

UE prevents alternations in related forms by requiring that these forms resemble one another. No form has priority, so there is no base in the same sense that we see in TCT. In TCT, a base influences the form of the derivative, and not vice versa. (Even though we have seen the definition of a base is loose when we consider inflectional paradigms, there is still a base). In UE, all forms influence each other in the process of being realized as consistently as possible. Burzio 1994 advocates a similar approach, ‘Metrical Consistency’ (MC), which requires that “Every morpheme must be as metrically consistent as possible.” Again, no form is given priority; instead, all related forms influence each other.

How might these approaches change the discussion at hand? A symmetric approach avoids the difficulty we mentioned earlier for TCT and inflectional paradigms. That is, questions around what, if any, form can be a base if it is part of an inflectional paradigm disappear if there is no principle of base priority at all. In particular, the discussion of how a base is not a morphologically simplex form is not necessary. Since all forms influence each other, there is no need to define a base with priority.
But there are two main problems with the UE-type approaches (see McCarthy 2001 for more discussion). The first is that a system like UE or MC is very powerful. Since all related forms can influence each other, it is possible for words with related morphemes to influence each other’s phonology. However, as McCarthy points out, there are no concrete examples of this prediction (cf. Burzio 1994 for a different view). The second is that, as McCarthy claims, the statements like UE are “too ill-defined to serve as constraints” in OT (McCarthy 2001: 4). Specifically, it is not clear how many violation-marks should be assessed for paradigms which do not satisfy uniformity.

To address the problems both symmetric and asymmetric theories show in accounting for paradigmatic uniformity effects, McCarthy proposes another model, closely related to UE but with “the best elements of both TCT and UE” (2001: 4). The model is called Optimal Paradigms (OP). Because he sees TCT as incapable of accounting for inflectionally related forms, McCarthy proposes a symmetric approach with the following central principles:

(102) **OP in Outline (McCarthy 2001):**

**a. Candidates consist of entire inflectional paradigms.**

b. Markedness and input-output faithfulness constraints evaluate all members of the candidate paradigm. The violation-marks incurred by each paradigm member are added to those incurred by all the others.

c. The stem (shared lexeme) in each paradigm member is in a correspondence relation $\mathfrak{R}_{OP}$ with the stem in every other paradigm member. (That is, for every candidate paradigm $P$ there is a relation $\mathfrak{R}_{OP}$ on $P \times P$). There is no distinctive base—rather, every member of a paradigm is a base of sorts with respect to every other member.
With this approach, McCarthy provides a system of constraints, OP-Faith constraints, avoiding the problems noted with UE by specifying a concrete way of evaluating violations of these OP constraints. Also, the restriction on OP to members of a paradigm reigns in the effects of the system to only those forms which are paradigmatically related. Thus this supposes a division between derivational and inflectional morphology; OP accounts for inflectional morphology, while TCT is inadequate, according to McCarthy for inflection, but can still account for derivational morphology.

The OP system also supposes that, unlike derivational hierarchies, inflectional paradigms have members which are equal in their potential to influence the surface phonology of other members of the paradigm. The mere existence of a zero form within a paradigm is enough to influence the rest of the paradigm. In the section below, I show exactly how we can apply McCarthy’s system to accurately predict the paradigmatic uniformity effects we see in Ukrainian. All the mobile patterns can be predicted by an OP system, as long as the same constraints in our system are translated into OP-like constraints, but I show details only for the most general M1 pattern below.

3.7.4 OP Applied: Ukrainian M1

The same O-O faithfulness constraint we proposed in the base-derived TCT theory in section 3 can be represented as an OP constraint, OP-DepHd. We need an additional restriction on McCarthy’s proposal in (102)(a) so that the entire paradigm is not affected; only singular or plural paradigms are affected. As McCarthy shows, an OP constraint evaluates candidate paradigms, in this case, the sub-paradigms singular and plural. For
ease of exposition, however, we can show the crucially different forms within a paradigm only in the tableau. For example, some possible candidate paradigms for the plural stem /kovbas/ ‘sausage’ are as follows, showing nominative plural and genitive plural pairs:

<table>
<thead>
<tr>
<th>Candidate Paradigm</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. &lt; kovbásy&lt;sub&gt;nom.pl&lt;/sub&gt;, kovbás&lt;sub&gt;gen.pl&lt;/sub&gt;&gt;</td>
<td>This paradigm has <strong>no stress alternations</strong> (satisfying paradigmatic uniformity) but the nominative plural form violates Dep-Stress&lt;sub&gt;STEM&lt;/sub&gt;, by inserting stress on the stressless stem /kovbas/.</td>
</tr>
<tr>
<td>b. &lt; kovbasy&lt;sub&gt;nom.pl&lt;/sub&gt;, kovbás&lt;sub&gt;gen.pl&lt;/sub&gt;&gt;</td>
<td>This paradigm satisfies I-O faith constraints by avoiding stress on the nominative plural stem, but <strong>shows stress alternations</strong> between the nominative and genitive forms.</td>
</tr>
<tr>
<td>c. &lt; kovbasý&lt;sub&gt;nom.pl&lt;/sub&gt;, kovbas&lt;sub&gt;gen.pl&lt;/sub&gt;&gt;</td>
<td>This paradigm also satisfies I-O Faith by avoiding stress on both stems and shows <strong>no stress alternations</strong>. But the genitive plural form inserts a hypothetical vowel “ó” thus violating general Dep, which prohibits new segments.</td>
</tr>
</tbody>
</table>

The candidates (a) and (c) above show two possible ways to avoid stress alternations given the shape of the paradigm<sup>33</sup>. Since the genitive plural comes without overt inflection in the morphology, either its stem must be stressed as in (a) and (b) or a vowel must be inserted after the stem to bear stress as in (c). Both candidates (a) and (c) satisfy paradigmatic uniformity of stress, showing no stem-inflection alternation as (b) does.

Let us evaluate these candidate paradigms formally. Note that the OP constraint evaluates whole paradigms, and correspondence relationships between all pairs of candidates, but I show only the relevant comparisons in tableau (104):

<sup>33</sup> Another way to avoid stress alternations is the candidate paradigm <kóvbasy, kovbás,…> but since this incurs violations like (a), and an additional Coincide-Right violation, I do not consider it in the tableau.
Candidate paradigm (b) fatally violates the constraint on paradigmatic uniformity, OP-DEP<sub>HD</sub> 34. Candidate (a) satisfies the OP-Faith constraint but in doing so violates DEP-STRESS<sub>STEM</sub>, the IO constraint which prohibits stem stress insertion on inherently accentless stems like /kovbas/. This is better than candidate (c), where the satisfaction of the OP constraint is achieved by inserting a vowel, violating general DEP. Note that the violation marks are given only for the members shown; in reality, the constraint DEP-STRESS<sub>STEM</sub> is violated many more times when each member of the paradigm is considered. The constraint is actually violated seven times, for each member of the plural paradigm of /kovbas/. But these violations are not fatal, so the number is not crucial. (Neither is it crucial for Coincide-Right.)

Thus we see that the same constraint we proposed in the TCT system of base-derivative pairs, the O-O faithfulness constraint Dep<sub>HD</sub>, predicts the same winner in an OP system of constraints which considers members of a paradigm simultaneously. The generalization stays the same: in order to satisfy paradigmatic uniformity of stress, stress alternations between stem and inflectional position are avoided. The best way to do this is by ensuring

---

34 The violation shown here is for the OP evaluation of the relation: [kovbasý] 〉 [kovbás]. The symmetric relation [kovbás] 〉 [kovbasý] is also evaluated by the OP constraint, and would incur an additional violation of OP-DEP<sub>HD</sub>.
faithfulness between members of the paradigm in terms of stress position. Realizing stress to inflection throughout the paradigm is fatal since this necessitates final vowel insertion of the zero form. Realizing stress on stem position is successful, thus sacrificing I-O Faith of the inherently stressless stem for O-O / OP Faith.

McCarthy’s evidence for making crucial reference to paradigms rests on Arabic noun and verb templates. Bobaljik 2002 counters that the Arabic templates do not necessitate an OP-like approach. Bobaljik also shows that a similar case of apparent paradigm uniformity in Itelmen syllabification cannot be derived by making explicit reference to paradigms. There is nothing, he claims, to recommend a paradigm-uniformity approach like McCarthy’s over those of Cyclic/ Base-Priority approach. A base-priority account like the one presented here would need to stipulate the differences between nouns and verbs in the lexicon, but there is no evidence that a base-priority theory is threatened by the available evidence.

3.8 CONCLUSION

There is a generalization in Ukrainian inflectional stress which is best captured by an asymmetric approach like the one I propose. This is the generalization that the unaffixed form within a Ukrainian M1 paradigm is what triggers the O-O faithfulness effects in the rest of the inflectional paradigm. Our system, unlike McCarthy’s OP model, isolates this form as a base, capturing the base as a privileged form. Since it is possible to isolate special characteristics of the paradigm in the Ukrainian M1 pattern (i.e. the unaffixed base), the pattern does not provide evidence that whole paradigms, rather than base-
derivative pairs, are evaluated. In Chapter 4, we will also see that an approach that rests on the evaluation of whole paradigms does not facilitate an analysis of the more complex cases of Mobile stress in Ukrainian. The data presented for Ukrainian does not support the notion that the knowledge of a grammar must include paradigms; we do not need to refer crucially to paradigms to account for Ukrainian stress.

In the next chapter, I examine more complex cases of Ukrainian stress, where Mobile stress is not the M1-type we saw in this chapter. In terms of numbers, the M1 group is a substantial group of Mobile stes; the chart below compares numbers for all the Post-stem and Mobile stems in the Database:

<table>
<thead>
<tr>
<th>Stress Pattern</th>
<th>Number of stems in Database</th>
</tr>
</thead>
<tbody>
<tr>
<td>POST-STEM</td>
<td>296</td>
</tr>
<tr>
<td>MOBILE</td>
<td></td>
</tr>
<tr>
<td>M1</td>
<td>171</td>
</tr>
<tr>
<td>M2</td>
<td>32</td>
</tr>
<tr>
<td>M3</td>
<td>223</td>
</tr>
</tbody>
</table>

Thus far we have accounted for Post-stem stress and Mobile group M1. Both M1 and M2 stems both have a plural base, with stem stress in the plural; together these stems number 203. The M3 group shows stem stress in the singular due to a singular base, as we will see in the next chapter. Chapter 4 also examines the smaller M2 group with initial stem stress in the plural, and ‘unstable’ stems where stem stress is not restricted to a particular subparadigm.
Chapter 4
Mobile Stress: Analysis of Complex cases

4.1 INTRODUCTION

Mobile nouns, like the Post-stem stressing group, are unspecified for stress. They differ from P stressing nouns by allowing stem stress in some cases. A Mobile stem’s unexpected stem stress was explained in Chapter 3 by the correspondence relation between base and derivative, where the base was assigned rightmost stem stress. For the M1 stress we saw in Chapter 3, the base was the uninflected form, the genitive plural; it forced paradigmatic identity effects so that the rest of the plural sub-paradigm realized stress in the same way: on the right edge of the stem. The crucial constraint ranking which ensured this was \(\text{OO-DEP}_{\text{HD}} \gg \text{DEP-STRESS}_{\text{STEM}}\) as we saw in the tableau for O-O effects in the word [krasoty] ‘beauty nom.pl.’, repeated below:

\[
\begin{array}{|c|c|c|c|}
\hline
\text{Base} & /\text{krasot}+/ & \text{OO-DEP}_{\text{HD}} & \text{DEP-STRESS}_{\text{STEM}} & \text{COINCIDE-R} \\
\hline
\text{krasot} & \text{krasot}-\text{y} & *! & * & *! \\
\text{krasot} & \text{krasot}-\text{y} & * & * & *! \\
\text{krasot} & \text{krasot}-\text{y} & * & * & *! \\
\hline
\end{array}
\]

The high ranking of the constraint \(\text{OO-DEP}_{\text{HD}}\) permits stem stress insertion in special cases. In this case, the uninflected zero form in the plural paradigm is the base [krasot].

By O-O faith, the stress in the derivative cannot be placed on a new segment; (b) violates the constraint \(\text{OO-DEP}_{\text{HD}}\) by assigning stress to the segment [-í] which is not present in the base [krasot]. (a) and (c) both satisfy O-O faith by inserting stress on stem position;
(a) is optimal because default stem stress position is rightmost, by COINCIDE-R. Thus the base form affects stress realization in the rest of the plural paradigm because O-O faith is ranked higher than DEP-STRESS\textsubscript{STEM}.

The sections below consider other more complex Mobile patterns in turn. First, the M2 pattern\textsuperscript{36} (made up of the smallest number of stems: 32) shows leftmost stem stress; we will see in Section 3.2 that this apparent contradiction to the ranking of COINCIDE-R is due to an additional IDENT requirement on O-O faithfulness. Second, the M3 pattern (made up of 223 stems) shows O-O faithfulness effects in the singular; this pattern is reconciled with the Post-stem stressing nouns which have a potential base but no O-O effects in the singular. Finally, Section 3.4 analyses the instability cases and other exceptional patterns noted in Chapter 1.

4.2 M2 PLURAL

4.2.1 Description

Like M1, M2 also allows stem stress where we might otherwise expect inflectional stress. However, the stem stress is not stem-final, as it is in M1 stems. M2 is the Mobile pattern of stress where singular inflectional stress varies with plural stem-initial stress, as in /fiolov/ ‘head’ below:

\textsuperscript{36} The M2 group includes monosyllabic stems if these show stem vowel changes; similarly, the M1 group included monosyllabic stems, but those did not show vowel quality changes.
Note that unlike M1, the genitive plural above does not pattern with the rest of the plural paradigm. Here, stress is on the stem-final vowel (there is a zero inflectional ending) for the genitive, but stem-initial for the nominative.

A problem arises when we consider our constraints on stress for the M2 nominative plural on stems like /fiolov/. Our system so far assumes that the genitive plural form, fioliv, because of its lack of inflection, acts as a base. OO-DEP.hd then triggers base/output correspondence for stress between the genitive plural and the nominative plural. But this makes the wrong prediction, as shown by the below, which marks the incorrect optimal candidate (a):

High-ranking OO-DEP.hd ensures that (c) is eliminated because this candidate inserts stress onto a segment which has no correspondent in the base: the inflectional affix of the

---

\[37\] I assume (after Slavic literature) that the accusative and vocative singular pattern with the plural for these classes of nouns; see section 4.4 for details.
nominative plural. (a) should be optimal because stress is realized on a segment which is present in the base genitive plural form, satisfying OO-DEPHD and because (a) satisfies COINCIDE-R whereas (b) does not.

But candidate (a) is not our desired candidate; the actual surface form is (b). The stress is *not* on the final vowel as we might expect given our result earlier for /kovbas/, where the rest of the plural paradigm followed the genitive plural final stress: [kovbás]. Why does M2 not show plural stress stem-finally according to its genitive plural forms? That is, why do the forms in above not level with the genitive plural as do forms for the M1 pattern?

The problem above rests on the form of the base, specifically, on the nature of the base vowel. For all of the forms which show Pattern M2, and none of the forms which show M1, the final vowel in the genitive plural is always different from the final stem vowel in the nominative plural, as we see below:

<table>
<thead>
<tr>
<th>(109) M2 initial stress</th>
<th>NOM.PL</th>
<th>GEN.PL</th>
</tr>
</thead>
<tbody>
<tr>
<td>bóron-y</td>
<td>borín</td>
<td></td>
</tr>
<tr>
<td>fiólov-y</td>
<td>fiolív</td>
<td></td>
</tr>
<tr>
<td>sýrot-y</td>
<td>syrít</td>
<td></td>
</tr>
<tr>
<td>skóvorod-y</td>
<td>skovoríd</td>
<td></td>
</tr>
<tr>
<td>slóbod-y</td>
<td>slobíd</td>
<td></td>
</tr>
<tr>
<td>stóron-y</td>
<td>storín</td>
<td></td>
</tr>
<tr>
<td>véred-y</td>
<td>veríd</td>
<td></td>
</tr>
</tbody>
</table>

The plural forms do not show the same stress as the genitive plural. This fact correlates with the observation that the stem-final vowel in the genitive plural is *not* featurally identical to the input head vowel in terms of vowel quality.
Whereas the change in vowel quality occurs in the nouns in M2, in M1 the vowel stays the same, and the stress stays the same in both nominative and genitive:

(110)  M1 final stem stress

<table>
<thead>
<tr>
<th>NOM.PL.</th>
<th>GEN.PL.</th>
</tr>
</thead>
<tbody>
<tr>
<td>kovbás-y</td>
<td>kovbás</td>
</tr>
<tr>
<td>udóv-y</td>
<td>udóv</td>
</tr>
<tr>
<td>buláv-y</td>
<td>buláv</td>
</tr>
<tr>
<td>filybýn-y</td>
<td>filybýn</td>
</tr>
<tr>
<td>vysót.y</td>
<td>vysót</td>
</tr>
</tbody>
</table>

It is not possible to distinguish the stems which do and do not change vowel quality by an independent surface property. For example, the final consonants in M1 and M2 stems are not distinct.

As explained in the Appendix, there is a historical reason for distinguishing the stems in (109) in the lexicon; specifically, a combination of a particular stem and a historical inflectional vowel result in the final stem vowel shift. Since this is a synchronic account, I will assume the stems are a separate class in the lexicon (leaving the particulars of the historical analysis behind) and that a special constraint on vowel quality can thus affect only that class by being co-indexed with the class. The constraint will ensure that the final vowel in this special class of stems changes in closed syllables.

Below I use the ♦ symbol to mark the special class of stems which I consider exceptional in this respect: they show closed-syllable-raising (and fronting for the case of [o]) in stem-final position. Most stems with [e] or [o] in final position do not show this type of stem vowel change. Thus the only stem affected are those which are specially marked
and coindexed with the special constraint. The constraint in (111) allows only [i] in closed syllables for such stems:

(111) [iC]: in the context of stems, only [i] is licensed in a closed syllable

The constraint in (111) is given as a licensing constraint, but it could also be thought of as a group of markedness constraints: markedness against [e] and [o] in closed syllables in such stems, and a markedness hierarchy which prefers [i] as the unmarked vowel in such contexts. Alternatively, we could also suppose that these stems have an underlying floating features [+high, +front], the synchronic counterparts of a historical jer vowel (often discussed in the Slavic and linguistic literature, cf. references in Appendix), which is licensed in closed syllables. I will leave the details for further research and assume the constraint above as a necessary simplification.

The constraint under consideration must be ranked above general Identity of input-output vowel features; Ident is repeated below from Chapter 1:

(112) Identity: Correspondent segments must be identical for the feature (F).
\[
\text{Ident}(F): \forall y \forall y' \forall F [yRy' \rightarrow y = y']
\]

In this case, we need Ident to hold between input and output vowel features like Ident [-HIGH], Ident [-ROUND], since the mid and round vowel [o] changes to [i]. The featural identity constraints are summarized in the cover constraint Ident-Vio:

---

38 This group of stems is considered exceptional in the Slavic literature due to the small number of stems affected in this way. Lexically indexed constraints are used here and in Chapter 5 for Russian to separate such effects from the default behavior seen for much larger groups of stems.
For the genitive plural [fioliv], the stem is specified as one which changes [o>i] if the vowel is in a closed syllable, shown by $\diamondsuit$. The vowel in question is the final stem vowel, followed by a consonant, and thus part of a closed syllable. Therefore, this vowel is changed to [i] in the genitive plural in the optimal candidate, at the expense of IDENT-V, faithfulness to input vowel features. Because IDENT-VIO is lower-ranked, faithful candidate (b) is eliminated.

The final vowel in a genitive plural like [fioliv], although unfaithful in terms of vowel quality, is still stressed, due to COINCIDE-R:

Candidates (c-d) do not shift vowel quality from input to closed syllable outputs as required in $\diamondsuit$ stems and are thus eliminated. All the candidates, by necessity, violate DEP-STRESSSTEM because there is no inflectional vowel; the stem must bear stress. The vowel in (a) is stressed as a result of COINCIDE-RIGHT, which ensures default rightmost stress for unspecified stems with no ending to stress, whereas (b) violates COINCIDE-RIGHT and is eliminated.
For other forms of the plural, the constraint on \( \diamond \) stems does not make crucial
distinctions between candidates. There is no closed syllable when inflectional endings are
added; the stem-final consonant is syllabified with the following inflectional vowel.
Thus vowel quality stays the same, obeying the general constraint that correspondent
vowels be identical for features in the input and output, \( \text{IDENT-V} \). Consider the dative
plural \( \text{fiolovam} \) (abstracting away from stress for the moment):

\[
\begin{array}{|c|c|}
\hline
\text{/ fiolov\_+ am/} & \text{[fiolov-am]} \\
\hline
(a) \text{fiol.lovam} & \Phi \\
(b) \text{fiol.lovam} & *! \\
\hline
\end{array}
\]

The tableau above abstracts away from stress to show the lack of vowel change; since the
constraint \( \Phi \text{[iC]} \) is vacuously satisfied by the lack of closed syllables, (a) is a better
candidate than (b), which violates \( \text{IDENT} \). Thus, inflected forms in the plural will show
the same vowel as the input, and not the [i] vowel of the genitive plural base.

4.2.2 M2: Analysis

We distinguish the M2 from M1 stems by their shift in vowel quality from input to
output. M1 stem vowels stay faithful to input stem vowels. The input form of the vowel
is maintained in most of the M2 paradigm since most cases show inflection. For the
genitive plural of M2 however, the stem final vowel is not followed by another vowel,
and the stem forms a closed syllable. We can now return to our problematic case, the
nominative plural of /fiolov/ ‘head’, with this distinction in mind.
The nominative plural form [fiólov-y] ‘head, nom.pl’ which caused problems in (108), and the other plural forms with initial stress, are predicted in part by the constraint on Head-Identity given below:

(116)  Head-Identity[F] (from Alderete 1990)
(c.f. McCarthy 1995; Alderete 1995; Zubritskaya 1995; Beckman 1998)

Correspondent segments contained in a prosodic head must be identical for F. If β is contained in a prosodic head in S₂, and αℜβ, then α and β agree in the feature F.

Let us extend this constraint to the O-O level, just as we extended the constraint Head-Dep to the O-O level. The constraint, showing the relativization to head position as an index (in keeping with our previous notation) is given in (117)⁵⁹:

(117)  OO-IDENT(F)₉hd
Correspondent base and derivative segments contained in a prosodic head must be identical for the feature (F).
If β is contained in a prosodic head in S₂, and αℜβ, then α and β agree in the feature F.

The crucial features that we know may change from the input to the genitive plural base are height and roundness, so we can specify for these features:

(118)  OO-IDENT(HIGH)₉hd
Correspondent base and derivative segments contained in a prosodic head must be identical for the feature [HIGH].

(119)  OO-IDENT(ROUND)₉hd
Correspondent base and derivative segments contained in a prosodic head must be identical for the feature [ROUND].

⁵⁹ Crucially, the constraints above in (118) and (119) penalize the “head β… in S₂”, i.e. derivative form heads, in a candidate like (120)(b). DEP constraints may capture this fact in a more transparent manner. The same effect can be ensured by Dep constraints which refer to privative features, e.g. OO-DEP (ROUND)₁hd and OO-DEP (HIGH)₁hd.
Thus if a pair of words stand in an OO-correspondence relation, the prosodic head of the
derivative is identical in terms of featural identity to the prosodic head of the base. In the
tableaux below, I use a shorthand for the constraints in (118) and (119):

**OO-IDENT**(HIGH, ROUND)\(_{HD}\) requires that a prosodic head must be identical for both
features [HIGH] and [ROUND].

Consider the potential candidates in the tableau below, where only stress varies. Recall
that quality shifts from input to output take place in the base, but not in the derivative,
since the derivative does not fulfil the closed syllable condition for a vowel shift. Thus,
the base stem-final vowel is [i], but [o] is the derivative stem-final vowel. To show
stress, we now include **OO-IDENT**(HIGH, ROUND)\(_{HD}\) in our ranking of constraints:

(120)  **OOFaith :** [fioliv] \(\rightarrow\) [fiólov-\(\acute{y}\)] ‘head, nom.pl’

<table>
<thead>
<tr>
<th>Base [fioliv]</th>
<th>/fiólov-y/</th>
<th><strong>OO-DEP</strong>(_{HD})</th>
<th><strong>DEP-STRESS</strong>(_{STEM})</th>
<th><strong>OO-IDENT</strong>(HIGH, ROUND)(_{HD})</th>
<th><strong>COINCIDE-R</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) fioliv</td>
<td>fiólov-y</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b) fioliv</td>
<td>fiolóv-y</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(c) fioliv</td>
<td>fiolov-(\acute{y})</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

The ranking of **OO-IDENT**(HIGH, ROUND)\(_{HD}\) with respect to the two **DEP** constraints is not
crucial (shown by the double line in 67). But **OO-IDENT**(HIGH, ROUND)\(_{HD}\) >> **COINCIDE-R**
is crucial. This ensures that (b) is eliminated and (a) is optimal; stress is not realized on
the rightmost stem vowel because identity between output heads is more important than
rightmost alignment of stress.

Recall that by **OO-DEP**\(_{HD}\) every prosodic head in the derivative must a correspondent in
the base. The inflectional ending in [fiolov-\(\acute{y}\)] is the head of the derivative, and it does
not have a base correspondent, since the base shows no inflectional suffix. Thus (c) crucially violates \( \text{OO-DEP}_{\text{HD}} \) by inserting stress on a head not present in the base.

Candidates (a) and (b) both incur violations of \( \text{DEP-STRESS}_{\text{STEM}} \). Crucially, (b) also incurs a violation of \( \text{OO-IDENT(HIGH, ROUND)}_{\text{HD}} \) because the head in the derivative, \( o \), is not identical in terms of features to its correspondent in the base, \( i \). Specifically, \([i] \) is \([+\text{high}, -\text{round}]\); \([o] \) is \([-\text{high}, +\text{round}]\). By contrast, (a) satisfies \( \text{OO-IDENT(HIGH, ROUND)}_{\text{HD}} \) since the head in the derivative is the stem initial \([o]\), and this is identical to the stem-initial vowel in \([\text{fi}o\text{l}i\text{v}]\). Note that (c) satisfies \( \text{OO-IDENT(HIGH, ROUND)}_{\text{HD}} \) also, in this case vacuously, since the head in the derivative is not present in the base, and so there is no correspondence relation between a base-derivative pair of vowels. But the lack of a base vowel pair for the head in (c) is the cause of the crucial violation of \( \text{OO-DEP}_{\text{HD}} \).

Thus OO-faithfulness asserts itself in two ways for segments contained in a prosodic head: (1) by \( \text{OO-DEP}_{\text{HD}} \), the segment which bears stress in a derivative vowel must be present in the base and (2) by \( \text{OO-IDENT(HIGH, ROUND)}_{\text{HD}} \), the derivative head vowel must have an identical correspondent in the base.

One final point remains. For longer forms like \([\text{skovorodá}] \) ‘frying pan’, the plural shows stress on the very leftmost edge of the stem: \([\text{skóvorod}y]\). This is predicted by the ranking of \( \text{COINCIDE-RIGHT} \) above; the presence of \( \text{COINCIDE-RIGHT} \) implies \( \text{COINCIDE-LEFT} \) also exists in the grammar:

\[
(121) \quad \text{COINCIDE (σ, Leftmost(σ, stem))}
\]
(i) For all x (x is a stressed syllable), there exists y (y = Leftmost(σ, stem) ) and COINCIDE (x, y)).

(ii) Assess one mark for each value of x for which (i) is false.

With COINCIDE-RIGHT >> COINCIDE-LEFT (the ranking implied by our earlier analysis, which simply ignored Coincide-Left as a low-ranked constraint) we make the right prediction for the nominative plural derivative [skóvorod-y]. I include all the relevant constraints in the tableau below:

(122) /skovorod+y/ → [skóvorod-y] ‘frying pan, nom.pl.’

<table>
<thead>
<tr>
<th>Base</th>
<th>/skovorod-y/</th>
<th>OO-DEP&lt;sub&gt;HD&lt;/sub&gt;</th>
<th>DEP-STRESS&lt;sub&gt;STEM&lt;/sub&gt;</th>
<th>OO-IDENT(HIGH, ROUND)&lt;sub&gt;HD&lt;/sub&gt;</th>
<th>COINC-R</th>
<th>COINC-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)skovoríd</td>
<td>skovórod-y</td>
<td>*</td>
<td>*</td>
<td>!</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b)skovoríd</td>
<td>skovorod-ý</td>
<td>*</td>
<td>*</td>
<td>!</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(c)skovoríd</td>
<td>skóvorod-ý</td>
<td>*</td>
<td>*</td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>
| (d) skovoríd| skovořod-ý   | *                    | *                         |                                 | *       | *       | *(d)skovoríd

The stressed vowel in the derivative must also be featurally identical to its correspondent in the base; the stressed [ó] in (a) is not and violates OO-IDENT(HIGH, ROUND)<sub>HD</sub>. (b) has an inappropriate head since the inflectional vowel is not present in the base, violating OO-DEP<sub>HD</sub>. In (c) and (d), the stressed vowels are present in the base (satisfying OO-DEP<sub>HD</sub>) and are featurally identical to both their base correspondents, (satisfying IDENT(HIGH, ROUND)<sub>HD</sub>). (d) realizes stress in the middle vowel, violating both COINCIDE-RIGHT and COINCIDE-LEFT. The optimal candidate is (d), which realizes stress at the only available stem edge, the leftmost stem vowel, satisfying COINCIDE-LEFT.

Note that this analysis necessitates a constraint which assigns categorical violations, like Coincide. Coincide may be replaced with Alignment only if Alignment is considered a
categorical, and not gradient, constraint. Such an alignment constraint is proposed by McCarthy 2002; his proposed Align-by-X can be extended to the case at hand as:

\[(123)\quad \text{ALIGN-BY-}\sigma (\text{Stress, Stem, R}): \text{No syllable stands between the right-edge of stress and the right edge of stem.}\]

I will continue to use Coincide-R in the analysis here in order to make clear that the constraint incurs categorical violations (whereas Alignment may be interpreted as a gradient constraint). But a categorical Alignment constraint like that in (123) is also possible.

4.2.3 Summary : M2 stress

In the previous two sections we saw OO-faithfulness effects predicting M1 and M2 stress; all of these stems have uninflected forms in the plural sub-paradigm; those forms necessarily have stem stress. Other related forms in the plural sub-paradigm also have stem stress due to Output-Output correspondence between the base form (in both M1 and M2, the genitive plural) and other members of the paradigm (in M1 and M2, other form of the plural).

In the immediately preceding section I restricted the kinds of Heads available for OO-correspondence by the ranking of \(\text{OO-IDENT(HIGH, ROUND)}_{\text{HD}}\) above \(\text{COINCIDE-Right}\) to predict M2. Our ranking of crucial constraints to predict stress patterns is now:

\[(124)\quad \begin{align*}
\text{HEAD} \\
\text{OO-DEP}_{\text{HD}} \\
\text{DEP-STRESS}_{\text{STEM}} \\
\text{COINCIDE-R (STRESS, STEM)}
\end{align*}
\]

\(\text{OO-IDENT(HIGH, ROUND)}_{\text{HD}}, \text{MAX-STRESS}\)
The only constraint new to our system in this chapter is \( \text{OO-IDENT(HIGH, ROUND)}_{\text{HD}} \), which helps explain M2 stress by ensuring that identical vowels are heads in OO relationships. We also see the first crucial satisfaction of \text{COINCIDE-LEFT} by mobile forms, also those with M2 stress.

The rankings crucially motivated by each pattern thus far are shown in (125):

\[
\begin{array}{ll}
\text{Stress type} & \text{Ranking} \\
\text{Fixed} & \text{MAX-STRESS}_{\text{STEM}} \gg \text{COINCIDE-RIGHT} \\
P & \text{DEP-STRESS}_{\text{STEM}} \gg \text{COINCIDE-RIGHT} \\
\text{M1:} & \text{OO-DEP}_{\text{HD}} \gg \text{DEP-STRESS}_{\text{STEM}} \gg \text{COINCIDE-RIGHT} \\
\text{M2:} & \text{OO-DEP}_{\text{HD}} \gg \text{DEP-STRESS, OO-IDENT(HIGH, ROUND)}_{\text{HD}} \gg \text{COINCIDE-R, COINCIDE-L} \\
\end{array}
\]

4.3 M3: MOBILE MONOSYLLABLES

The final pattern of Mobile stress in Ukrainian is for 2\textsuperscript{nd} declension stems showing M3 stress. Often, 2\textsuperscript{nd} declension stems show Post-stem stress as we saw in 2.3. But some 2\textsuperscript{nd} declension stems show M3 stress, where stem stress in the singular is replaced by ending stress in the plural. There are 223 such stems in the Database given at the end of the thesis.\(^{40}\)

4.3.1 M3: Description

\(^{40}\) As noted in the introduction to the database, I exclude from consideration borrowed stems, some of which are M3-type stems; only native Ukrainian stems are considered.
An example of M3 stress, with stress on the inflection in the plural, and on the stem in the singular, is /kraj/ ‘land’:

(126) M3 : /kraj/ ‘land’

<table>
<thead>
<tr>
<th>N.</th>
<th>Pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sg</td>
<td>kra̕j</td>
</tr>
<tr>
<td>G.</td>
<td>kra̕j-u</td>
</tr>
<tr>
<td>D.</td>
<td>kra̕j-evi</td>
</tr>
<tr>
<td>A.</td>
<td>kra̕j</td>
</tr>
<tr>
<td>I.</td>
<td>kra̕j-em</td>
</tr>
<tr>
<td>L.</td>
<td>kra̕j-i</td>
</tr>
<tr>
<td>V.</td>
<td>kra̕j-u</td>
</tr>
</tbody>
</table>

I propose that the zero ending in these stems in the nominative also triggers output-output correspondence, along the lines of that seen for the other Mobile stress patterns; thus we would predict the correct result by our ranking of OO-DepHd >> Dep-StressStem as for M1, M2 above. The difference for M3 is that the nominative (or accusative\(^{42}\)) singular is the Base for the other members of the singular paradigm which have inflectional endings, not the genitive plural as in M1, M2 patterns.

The problem is that Post-stem stressing stems also show a singular form without inflection, as in the example below, repeated from Chapter 2:

---

\(^{41}\) The variant [kraj-ú] is also accepted; the locative can therefore pattern with the plural; see Appendix 2 for details of different cases patterning with particular paradigms.

\(^{42}\) Although for this form the accusative can also act as a base, for animate nouns the accusative is not without inflection, but has a suffix (usually the same ending as the genitive). Therefore a more general statement is that the nominative singular form acts as a base for forms with inflection. As we saw in Chapter 3, however, any overtly uninflected form, or more than one form, can act as base(s).
The singular form in this P pattern does not force stress on the stem in the rest of the singular paradigm.

Why does the singular form in the M3 stressing paradigm above in (126) act as a base, (i.e. showing O-O stem stress effects in the rest of the paradigm) whereas the form in the P paradigm does not? The crucial difference is that Post-stem stressing nouns like /fiarbuz/, are usually multisyllabic, not monosyllabic stems. By contrast, the vast majority of M3 stems like /kraj/ are monosyllabic stems. Bilodid 1969 refers to this pattern as composed ‘largely’ of monosyllabic stems. Statistical studies of Ukrainian stress distribution are not available, but in my study (see “DATABASE”), I found 82% of the stems showing this pattern to be monosyllabic.

43 The exceptions to this statement are as follows. 4th declension stems with collective –en suffixes, including those which are not always monosyllabic, always show M3 stress. Some other suffixes, e.g. the diminutive -k in the plural, can also require M3 stress in the paradigm regardless of the length of the stem. I will assume these are lexically marked so that the stems belong to the Mobile stress pattern. There is also a finite list of monosyllabic stems which show zero nominative inflection, and hence should belong to Mobile class, but are Post-stem stressing stems. These are:

/ byk, vil, filek, dym, firak, kit, kortʃ, krjuk, put’, rab, smak, stil, tkatʃ, ūvets, ūpyk /

I assume that these stems are lexically marked as P stems; another option is to mark and co-index the stems I call M3 with the O-O constraint, losing the mono/multi-syllabic generalization explained here, and requiring lexical marking of 223 M3 stems. Instead, I mark the 15 stems noted here.
Below I give some examples of these monosyllabic stems showing uninflected nominative singular forms, which affect the genitive (and other) singular forms to realize stem stress, whereas plural stress is always post-stem:

(128) M3 stems

<table>
<thead>
<tr>
<th>Nom.Sg</th>
<th>Gen.Sg</th>
<th>Nom.Pl</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>brát</td>
<td>brát-a</td>
<td>brat-ý</td>
<td>brother</td>
</tr>
<tr>
<td>víz</td>
<td>vóz-a</td>
<td>voz-ý</td>
<td>cart</td>
</tr>
<tr>
<td>vít</td>
<td>vík-u</td>
<td>vik-ý</td>
<td>age</td>
</tr>
<tr>
<td>vóvk</td>
<td>vóvk-a</td>
<td>vovk-ý</td>
<td>wolf</td>
</tr>
<tr>
<td>fiák</td>
<td>fiák-a</td>
<td>fiak-ý</td>
<td>hook</td>
</tr>
<tr>
<td>fírím</td>
<td>fíróm-u</td>
<td>firom-ý</td>
<td>thunder</td>
</tr>
<tr>
<td>dáx</td>
<td>dáx-u</td>
<td>dax-ý</td>
<td>roof</td>
</tr>
<tr>
<td>dz’ób</td>
<td>dz’ób-u</td>
<td>dz’ob-ý</td>
<td>beak</td>
</tr>
<tr>
<td>drít</td>
<td>drót-u</td>
<td>drot-ý</td>
<td>wire</td>
</tr>
<tr>
<td>dūb</td>
<td>dūb-a</td>
<td>dub-ý</td>
<td>oak</td>
</tr>
<tr>
<td>3ál’</td>
<td>3ál-u</td>
<td>3al-í</td>
<td>grief</td>
</tr>
<tr>
<td>kát</td>
<td>kát-a</td>
<td>kat-ý</td>
<td>executioner</td>
</tr>
<tr>
<td>kvás</td>
<td>kvás-u</td>
<td>kvas-ý</td>
<td>kvass (fermented drink)</td>
</tr>
<tr>
<td>kráj</td>
<td>kráj-u</td>
<td>kraj-í</td>
<td>land, country</td>
</tr>
</tbody>
</table>

Monosyllabicity is the characteristic which best distinguishes M3 nouns from Post-stem stressing nouns in Ukrainian.\(^{44}\)

4.3.2 M3: Analysis

To allow only monosyllabic stems to be affected by O-O relationship in this analysis, I assume the phonological condition below:

\(^{44}\) We will see in Chapter 5 that this is not the case for Russian.
(129) Phonological condition on O-O Faith:

OO correspondence as defined in (22) is Chapter 2 is restricted to monosyllabic stems for the singular subparadigm; the added restriction is given in bold type:

\[
\begin{align*}
\text{z} \in \mathcal{R} \text{x} & \quad \text{IFF:} \\
\text{z} & \text{ is an output member of } S_1 \quad \text{`Base'} \\
S_1 & = (S_y - O_y) \text{ set difference} \\
\text{z} & = [\text{+plural}] \text{ or } [\text{+monosyllabic}] \\
\text{x} & \text{ is an output member of } S_2 \quad \text{`Derivative'} \\
S_2 & = S_y \quad \text{ set of inflected forms in sub-paradigm}
\end{align*}
\]

The condition as given above is for the correspondence relationship between a base and derivative. The same condition could instead be realized as one not on the faithfulness relation as above, but on the OO-DEP\text{Hd} constraint. That is, the OO Faith constraint OO-DEP\text{Hd} can be restricted to the class of stems which are monosyllabic, and to plural forms for all stems. This would mean that the constraint OO-DEP\text{Hd} would be co-indexed with such a class of stems and forms. I will assume for our purposes here the condition given in (129), but note the other possibility of a special constraint.

For monosyllabic stems, the condition in (129) is satisfied, and the stems can enter into a base-derivative relationship. For such stems, I show the constraint OO-DEP\text{Hd} is crucially satisfied. But for P stems, the OO-DEP\text{Hd} constraint is vacuously satisfied, because there is no base which is either plural or monosyllabic; that is, the condition on “z” above does not allow multisyllabic singular stems like P stems to act as bases. Instead, for P stems, faithfulness to inherent lack of stress prevails, because OO-DEP\text{Hd} is never crucial. For ease of representation in the tableau I only show OO-DEP\text{Hd} when it is active, in Mobile stem cases.
Let us now consider the analysis for stress patterns in the monosyllabic stems in detail. Assume that the M3 Mobile pattern, like other Mobile patterns, is in part a result of the fact that these stems are not specified for stress in the input. The nominative singular Base, since it does not have inflection, realizes stress at the rightmost edge of the stem (in the M3 case it is also the only edge). The example below is for the M3 stem /kraj/ ‘land’:

(130) \textit{Base:} [kráj] ‘land nom. sg.’

<table>
<thead>
<tr>
<th></th>
<th>HEAD</th>
<th>DEP-STRESSSTEM</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>kraj</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b)</td>
<td>kraj</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

Candidate (a) is optimal by our constraints thus far. The stem syllable must be assigned stress, given the Headedness requirement in Ukrainian, necessarily violating DEP-STRESSSTEM. The nominative singular [kráj] is established as a Base according to the definition in (129) because it is both an overtly uninflected form (and hence a member of the set difference (S\textsubscript{Sg} – O\textsubscript{Sg}) and it is monosyllabic. This means other forms in the singular will also show stem stress by O-O faith to the base [kráj]. Consider the locative singular derivative (I consider only those candidates which satisfy Headedness):

(131) \textit{OOFaith:} /kráj+i/ ‘land loc.sg.’

<table>
<thead>
<tr>
<th></th>
<th>/kráj+i/</th>
<th>OO-DEP\textsubscript{HD}</th>
<th>DEP-STRESSSTEM</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>kráj-i</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b)</td>
<td>kraj-i</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

Candidate (b) crucially violates OO-DEP\textsubscript{HD} because the stressed -ú ending is not a segment present in the base, kráj. Thus the only other candidate, (a) is optimal because it stresses the only stem vowel.
The plural paradigm is treated separately, as expected. Since there is no uninflected form in the plural for the stem /kraj/, no form can trigger base-derivative correspondence in the plural, and the whole paradigm is realized with stress on the inflection. Consider the nominative plural /kraj+i/. Since there is no zero ending in the plural to trigger an Output-Output relation, the OO-HD-DEP constraint is vacuously satisfied:

(132) * No OO-Faith: plural paradigm

<table>
<thead>
<tr>
<th>/ kraj-i/</th>
<th>OO-HD-DEP</th>
<th>DEP-STRESSSTEM</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) kraj-i</td>
<td></td>
<td>*!</td>
<td>*</td>
</tr>
<tr>
<td>(b) kraj-i</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There is no form in the plural which can act as a base for OO-Faith in (132), so the plural paradigm shows stress as we might expect for stressless stems. This is because the optimal candidate (b) satisfies DEP-STRESSSTEM. Stem stress is avoided, and the plural inflection bears stress just like in Post-stem stressing forms.

4.3.3 M3: Summary

The M3 type of Mobile stems is predicted by the restriction on our OO-Faith relation which allows singular monosyllabic bases, but not multisyllabic bases. The constraint ranking we showed in the previous section does not change; it remains as in (124), repeated below:

(124) \[
\begin{array}{l}
\text{HEAD} \\
\text{OO-DEPHD} \\
\text{DEP-STRESSSTEM} \\
\text{COINCIDE-R (STRESS, STEM)} \\
\text{COINCIDE-L (STRESS, STEM)}
\end{array}
\]

\[
\begin{array}{l}
\text{OO-IDENT(HIGH, ROUND)HD, MAX-STRESSSTEM}
\end{array}
\]
4.4 SPECIAL CLASSES AND THEIR TREATMENT

The analysis thus far has examined the mobile patterns M1-M3, and has put aside some nouns, outlined in Section 1.4, as special classes which do not fall into the analysis thus far. These fall into two groups:

(1) Neuter nouns: some (not all) neuter nouns show fixed stress in the singular, post-stem stress in the plural; these stems also do not show base-derivative effects in the plural.

(2) Instability within the paradigm: some M1 nouns do not clearly distinguish stress along singular/plural lines.

4.4.1 Marked neuter

There is a small group of stems which seems exceptional given our analysis. This group forms a set within the neuter stems of second declension (2nd declension includes the masculine P and M3 type stems explained above in section 4.3). Before considering this group, section 4.1.1 summarizes the analysis which successfully accounts for most neuter stems in order to contrast this with the special neuter patterns.

4.4.1.1 Regular stems

Most neuter 2nd declension stems are unproblematic for the analysis presented here; they show the expected pattern of mobile stress when there is a zero form in the plural. Below I show multisyllabic and monosyllabic examples; both show the same M1 pattern:
Typical of an inherently unspecified stem, the singular in both the multi and monosyllabic examples shows inflectional stress; the plural shows base-affected stress, with a form without inflection requiring stem stress, i.e. stress in the same position as in the uninflected genitive plural form. The analysis thus far predicts the examples above as follows, since the base in both cases is plural (and in the latter example, monosyllabic).

Consider the analysis for the multi-syllabic example /pomel/ ‘broom’. The constraints in our system predict that the singular sub-paradigm shows all members with inflectional stress:

<table>
<thead>
<tr>
<th>Inflectional stress</th>
<th>Stem stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. pomel-ó</td>
<td>pomél-a</td>
</tr>
<tr>
<td>G. pomel-á</td>
<td>pomél</td>
</tr>
<tr>
<td>D. pomel-ú</td>
<td>pomél-am</td>
</tr>
<tr>
<td>A. pomel-ó</td>
<td>pomél-a</td>
</tr>
<tr>
<td>I. pomel-óm</td>
<td>pomél-amy</td>
</tr>
<tr>
<td>L. pomel-í</td>
<td>pomél-ax</td>
</tr>
<tr>
<td>V. pomel-ó</td>
<td>pomél-a</td>
</tr>
</tbody>
</table>

Typical of an inherently unspecified stem, the singular in both the multi and monosyllabic examples shows inflectional stress; the plural shows base-affected stress, with a form without inflection requiring stem stress, i.e. stress in the same position as in the uninflected genitive plural form. The analysis thus far predicts the examples above as follows, since the base in both cases is plural (and in the latter example, monosyllabic).

Consider the analysis for the multi-syllabic example /pomel/ ‘broom’. The constraints in our system predict that the singular sub-paradigm shows all members with inflectional stress:

<table>
<thead>
<tr>
<th>Inflectional stress</th>
<th>Stem stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. sel-ó</td>
<td>sél-a</td>
</tr>
<tr>
<td>G. sel-á</td>
<td>sél</td>
</tr>
<tr>
<td>D. sel-ú</td>
<td>sél-am</td>
</tr>
<tr>
<td>A. sel-ó</td>
<td>sél-a</td>
</tr>
<tr>
<td>I. sel-óm</td>
<td>sél-amy</td>
</tr>
<tr>
<td>L. sel-í</td>
<td>sél-ax</td>
</tr>
<tr>
<td>V. sel-ó</td>
<td>sél-a</td>
</tr>
</tbody>
</table>
Unspecified stem: /pomél+o/ 'broom sg.'

<table>
<thead>
<tr>
<th>/pomél+o/</th>
<th>DEP-STRESSSTEM</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) pomél-ó</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b) pomél-o</td>
<td>*!</td>
<td>*</td>
</tr>
<tr>
<td>(c) pómél-o</td>
<td>*!</td>
<td>*</td>
</tr>
</tbody>
</table>

Candidate (a) is optimal because it alone satisfies DEP-STRESSSTEM, inserting stress on a non-stem affix position.

Now let us consider the plural forms; here, there is a plural form without overt inflection which can act as a base. In genitive plural stress assignment, the stress is rightmost:

Base form: /pomél/ ‘broom gen.pl.’

<table>
<thead>
<tr>
<th>/pomél+∅/</th>
<th>DEP-STRESSSTEM</th>
<th>COINCIDE-R</th>
</tr>
</thead>
</table>
| (a) pomél | * | *!
| (b) pómél | * | *!

Since there is no inflectional ending, stress must be inserted on the stem, necessarily violating DEP-STRESSSTEM. The best candidate is (a) which realizes stem at rightmost position. This form then serves as the base for other forms of the plural. For example, the nominative plural is determined by OO faithfulness as below:

OO-Faith : /pomél/ 'broom nom. pl.'

<table>
<thead>
<tr>
<th>Base</th>
<th>/pomél-a/</th>
<th>OO-DEPHD</th>
<th>DEP-STRESSSTEM</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) pomél</td>
<td>pomél-a</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b) pomél</td>
<td>pomél-a</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(c) pómél</td>
<td>pomél-á</td>
<td>*!</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

The OO Faithfulness constraint OO-DEPHD ensures that of the derivative candidates for /pomél+a/, (a) is optimal, since it satisfies both OO-DEPHD and COINCIDE-R.
Thus the constraint ranking established thus far predicts this group of neuter stems. The OO-DEP_{HD} constraint in particular is important; it ensures plural paradigm uniformity.

4.4.1.2 Special neuter class: Description

Some neuter stems show an unexpected pattern, as follows. The singular shows stem stress, with inflectional endings that remain unstressed, so that the forms in the singular behave as though the stem is inherently stressed. But the plural arises as P-type stress, with stress on the inflection, behaving as though the stem is inherently unstressed:

(138) Monosyllabic neuter: exceptional
/lit/ ‘summer’

<table>
<thead>
<tr>
<th></th>
<th>Sg</th>
<th>Pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nom</td>
<td>lit-o</td>
<td>lit-á</td>
</tr>
<tr>
<td>Gen</td>
<td>lit-a</td>
<td>lit</td>
</tr>
<tr>
<td>Dat</td>
<td>lit-u</td>
<td>lit-ám</td>
</tr>
<tr>
<td>Acc</td>
<td>lit-o</td>
<td>lit-á</td>
</tr>
<tr>
<td>Inst</td>
<td>lit-om</td>
<td>lit-ámy</td>
</tr>
<tr>
<td>Loc</td>
<td>lit-i</td>
<td>lit-áx</td>
</tr>
<tr>
<td>Voc</td>
<td>lit-o</td>
<td>lit-á</td>
</tr>
</tbody>
</table>

Note only do the singular and plural behave as two separate types of patterns, F and P, but there is an uninflected form in the plural paradigm which does not trigger stem stress in the other plural forms, as we would expect.
4.4.1.3 Special neuter: Analysis

There are 22 stems which show stress like /lit/ ‘summer’ above; almost all are neuter and monosyllabic\(^{45}\). We make the right predictions for this group of stems if we take our separation of singular and plural sub-paradigms in the analysis one step further and allow separate specifications in the input for singular and plural paradigms for this special class. In this special class, the singular forms are specified for stress. Max-Stress ensures that stress is realized:

\[(139) \quad \text{Special neuter singular: Fixed stress /lit/ ‘summer’} \]

<table>
<thead>
<tr>
<th>/lit\textsuperscript{o}/</th>
<th>MAX-STRESS</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) lit-\textsuperscript{o}</td>
<td>*!</td>
<td>*</td>
</tr>
<tr>
<td>(b) lit-o</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The fact that this special neuter input stress in the singular is maintained is shown by candidate (b); it is optimal because faithfulness to input stress is most important.

The plural paradigm, on the other hand, must be unspecified for stress. Even given this proposal, the stems are problematic. We would expect the uninflected form to act as a Base for the rest of the plural paradigm. But this is not a typical plural sub-paradigm. These 22 monosyllabic neuter stems behave like the only other option available to unspecified stems: they behave like P-stems.

\(^{45}\) These stems analysed as exceptional due to their small number of stems; the next smallest group is the M2 group, consisting of 32 stems, which I treat as non-exceptional not only because of the larger number, but also because of its history as the ‘a-stem’ group which has received much attention in the Slavic literature (cf. Halle 1973, Shevelov 1979, Stankiewicz 1993 and others).
P stems are unaffected by OO-Faith because they do not satisfy basehood requirements; instead, P stems must satisfy \textsc{dep-stressstem}. Since these exceptional stems should be affected by OO-Faith, we can preclude the effects by a higher ranking \textsc{dep-stressstem} constraint. Let us index a special \textsc{dep-stressstem} constraint with this special class of 22 stems, which otherwise would show OO-Faith effects. This constraint is given below in the tableau in (140) as “\textsc{dep-stressstem-special}”:

\begin{verbatim}
\begin{center}
\begin{tabular}{|c|c|c|c|c|c|}
\hline
\textbf{BASE} & /lit-a/ & \textsc{dep-stressstem-special} & \textsc{oo-dephd} & \textsc{dep-stressstem} & \textsc{coincide-r} \\
\hline
lit & \textbullet (a) lit-á & \*! & \* & \* & \\
\hline
\end{tabular}
\end{center}
\end{verbatim}

OO-\textsc{dephd} is violated by (a) because this stem has a valid base. But the fact that the stem is in the exceptional class marks it as co-indexed with the special \textsc{dep-stressstem} constraint, and so the optimal candidate is (a) which resists stem stress. Candidate (b) does not, violating both special and general \textsc{dep-stressstem}, and is eliminated.

This special class of stems does not concur with the generalization which holds for Ukrainian: that monosyllabic and plural stems trigger OO-Faith effects. But this group is also unique by requiring different input specifications for singular and plural sub-paradigms. Thus their identification as a special class is necessary for two reasons: the singular and plural paradigms need different specification for stress, and the plural stems must also be co-indexed with a high-ranking \textsc{dep-stressstem} constraint to prevent OO-Faith effects.
4.4.2 Instability within number paradigms

4.4.2.1 Introduction

In the previous sections I divided Mobile stress patterns into ‘singular’ and ‘plural’ stress alternations. That is, all the cases (Nom, Gen, Dat…) of the singular are stem stressed and all the cases of the plural show inflectional stress (Pattern M3), or vice versa: all cases in the singular are stressed on the inflection and all cases in the plural are stem stressed (Patterns M1, M2). This kind of clear division between singular and plural is the most common stress pattern for Mobile patterns.46

However, the division of singular and plural cases for nouns of the 1st declension, the a-stems, often show an unstable paradigm, where all members within a singular or plural paradigm do not show the same accent. Bilodid 1969 writes that the instability within this declension is “an archaic reminder” of the Old Ukrainian accentual system for stems ending in –a, the 1st declension stems. For our synchronic account, we will need to find another explanation for the instability.

The examples below will show that there is no independent surface property that distinguishes the unstable patterns from stable patterns, or from one another. This is an important fact to keep in mind as we move through the description of the patterns in 4.2.2 to their analysis in 4.2.3. The analysis will rest on a hierarchy of case features which we will establish in the description that follows.

46 Bilodid 1969 identifies unstable forms as examples, but unfortunately he does not give the actual number.
4.4.2.2 Description

In the analysis proposed here, 1st declension shows either M1 and M2 patterns; both of these show stress on the inflectional ending in the singular, and on the stem in the plural. For some stems, this characterization is true throughout the entire singular and plural paradigm. An example of such a ‘stable’ stem is /rik/ ‘river’ in (141). I call this stable pattern ‘Pattern 1: sg vs. pl’.

(141) Pattern 1: sg vs. pl
/rik/ ‘river’

<table>
<thead>
<tr>
<th>Nom</th>
<th>SG</th>
<th>PL</th>
</tr>
</thead>
<tbody>
<tr>
<td>rik-á</td>
<td>rík-y</td>
<td></td>
</tr>
<tr>
<td>rik-ý</td>
<td>rík</td>
<td></td>
</tr>
<tr>
<td>Dat</td>
<td>ríts-î</td>
<td>rík-am</td>
</tr>
<tr>
<td>rik-ú</td>
<td>rík-y</td>
<td></td>
</tr>
<tr>
<td>Acc</td>
<td>rik-óju</td>
<td>rík-amy</td>
</tr>
<tr>
<td>ríts-î</td>
<td>rík-ax</td>
<td></td>
</tr>
<tr>
<td>rik-ó</td>
<td>rík-y</td>
<td></td>
</tr>
</tbody>
</table>

The association between number and stress pattern is uniform: all singular cases show inflectional stress, and all plural cases show stem stress:

(142) Pattern 1: Sg patterns vs. Pl

<table>
<thead>
<tr>
<th>Singular: Affix stress in all case forms</th>
<th>Plural: Stem stress in all case forms</th>
</tr>
</thead>
</table>

But many Mobile M1 stems show some type of intra-paradigmatic instability in terms of the accentual pattern. For example, one group of M1 stems shows the vocative singular
patterning with the plural paradigm in terms of stress; i.e. vocative singular stress is on
the stem, as in all the plural case forms. An example of Pattern 2 is given in (143) below:

(143) Pattern 2: /vdov/ ‘widow’

<table>
<thead>
<tr>
<th>Nom</th>
<th>PL</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG</td>
<td>Nom</td>
</tr>
<tr>
<td>vdo-á</td>
<td>vdo-y</td>
</tr>
<tr>
<td>Gen</td>
<td>Gen</td>
</tr>
<tr>
<td>vdo-ý</td>
<td>vdi</td>
</tr>
<tr>
<td>Dat</td>
<td>Dat</td>
</tr>
<tr>
<td>vdo-í</td>
<td>vdo-am</td>
</tr>
<tr>
<td>Acc</td>
<td>Acc</td>
</tr>
<tr>
<td>vdo-ú</td>
<td>vdo-y</td>
</tr>
<tr>
<td>Instr</td>
<td>Instr</td>
</tr>
<tr>
<td>vdo-óju</td>
<td>vdo-amy</td>
</tr>
<tr>
<td>Loc</td>
<td>Loc</td>
</tr>
<tr>
<td>vdo-í</td>
<td>vdo-ax</td>
</tr>
<tr>
<td>Voc</td>
<td>Voc</td>
</tr>
<tr>
<td>vdo-o</td>
<td>vdo-y</td>
</tr>
</tbody>
</table>

The paradigm can be represented schematically with the vocative patterning with the
plural as below:

(144) Pattern 2: Voc Sg patterns with Pl:

<table>
<thead>
<tr>
<th>SINGULAR</th>
<th>PLURAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nom</td>
<td>Nom</td>
</tr>
<tr>
<td>Gen</td>
<td>Gen</td>
</tr>
<tr>
<td>Dat</td>
<td>Dat</td>
</tr>
<tr>
<td>Acc</td>
<td>Acc</td>
</tr>
<tr>
<td>Instr</td>
<td>Instr</td>
</tr>
<tr>
<td>Loc</td>
<td>Loc</td>
</tr>
<tr>
<td>Voc</td>
<td>Voc</td>
</tr>
</tbody>
</table>

For this class, the vocative singular must behave like the vocative plural (and the plural
generally).

The analysis of these stems and stems below is problematic because since most of the
stems showing instability between singular and plural in terms of case stress assignment
are 1st declension stems, they share the same inflectional endings (see Chapter 1). There is no way in which the type of ending can determine the accentual pattern. For example, the vocative singular ending in all the stable and unstable patterns is always –o. There is also nothing about the stem vowels that can distinguish these patterns; the examples given below all have stem-final [o] vowels to illustrate this fact.47 There are other vowels which end stems in these patterns as well.)

In section 4.2.2, I outline an analysis which accounts for this type of behavior. First, let us consider other examples of unstable cases. Whereas in the stem /vdov/ ‘widow’ in (143) only the singular vocative case patterns with the plural, in Pattern 3, /fior/

‘mountain’ shows both accusative and vocative singular patterning with plural stem stress:

(145) Pattern 3: /fior/ ‘mountain’

<table>
<thead>
<tr>
<th></th>
<th>SG</th>
<th>PL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nom</td>
<td>fiór-á</td>
<td>fiór-y</td>
</tr>
<tr>
<td>Gen</td>
<td>fiór-ý</td>
<td>fiír</td>
</tr>
<tr>
<td>Dat</td>
<td>fiór-i</td>
<td>fiór-am</td>
</tr>
<tr>
<td>Acc</td>
<td>fiór-u</td>
<td>fiór-y</td>
</tr>
<tr>
<td>Inst</td>
<td>fiór-óju</td>
<td>fiór-amy</td>
</tr>
<tr>
<td>Loc</td>
<td>fiór-i</td>
<td>fiór-ax</td>
</tr>
<tr>
<td>Voc</td>
<td>fiór-o</td>
<td>fiór-y</td>
</tr>
</tbody>
</table>

The paradigm can be represented schematically with the accusative and vocative singular patterning with the plural as below:

---

47 Many of the stems which end in [o] show a shift to [i] in the genitive plural, but this is not relevant here; many other stems show instability effects and do not show the shift vowels, cf. (154) and others like /duʃ/, /zœml/, /zym/, /kum/, /ruk/.
Pattern 3: Acc & Voc Sg pattern with Pl:

<table>
<thead>
<tr>
<th>SINGULAR</th>
<th>PLURAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nom</td>
<td>Nom</td>
</tr>
<tr>
<td>Gen</td>
<td>Gen</td>
</tr>
<tr>
<td>Dat</td>
<td>Dat</td>
</tr>
<tr>
<td>Acc</td>
<td>Acc</td>
</tr>
<tr>
<td>Instr</td>
<td>Instr</td>
</tr>
<tr>
<td>Loc</td>
<td>Loc</td>
</tr>
<tr>
<td>Voc</td>
<td>Voc</td>
</tr>
</tbody>
</table>

An even more complex pattern is shown by M1 stems which show the same patterning as /fior/ for the singular, but with oblique cases of the plural showing inflectional stress.

This is the final of our unstable patterns, Pattern 4:

Pattern 4: /nofi/ ‘foot’

<table>
<thead>
<tr>
<th>Nom</th>
<th>PL</th>
</tr>
</thead>
<tbody>
<tr>
<td>nofi-á</td>
<td>nófi-y</td>
</tr>
<tr>
<td>nofi-ý</td>
<td>nífi</td>
</tr>
<tr>
<td>nozi</td>
<td>nofi-ám</td>
</tr>
<tr>
<td>nófi-u</td>
<td>nófi-y</td>
</tr>
<tr>
<td>nofi-óju</td>
<td>nofi-ámy</td>
</tr>
<tr>
<td>nozi</td>
<td>nofi-áx</td>
</tr>
<tr>
<td>nofi-o</td>
<td>nófi-y</td>
</tr>
</tbody>
</table>

This is the most complex of the inter-paradigm instability cases. The complexity of the problem is apparent in the attempt at a schematic representation given in the table below:
Pattern 4:
Acc & Voc Sg pattern with Nom Pl;
Dat, Inst, Loc Pl pattern with Sg

<table>
<thead>
<tr>
<th>SINGULAR</th>
<th>PLURAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nom</td>
<td>Nom</td>
</tr>
<tr>
<td>Gen</td>
<td>Gen</td>
</tr>
<tr>
<td>Dat</td>
<td>Dat</td>
</tr>
<tr>
<td></td>
<td>Acc</td>
</tr>
<tr>
<td>Inst</td>
<td>Inst</td>
</tr>
<tr>
<td>Loc</td>
<td>Loc</td>
</tr>
<tr>
<td>Voc</td>
<td>Voc</td>
</tr>
</tbody>
</table>

I summarize the different unstable patterns possible for the 1st declension below, based on Bilodid 1969; a dash separates stem and inflectional syllables; cases patterning unlike the nominative in the relevant number sub-paradigm are highlighted:

<table>
<thead>
<tr>
<th>SINGULAR</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nom</td>
<td>vdo-á</td>
<td>fíor-á</td>
<td>nòfi-á</td>
</tr>
<tr>
<td>Gen</td>
<td>σ-ý</td>
<td>σ-ý</td>
<td>σ-ý</td>
</tr>
<tr>
<td>Dat</td>
<td>σ-ý</td>
<td>σ-ý</td>
<td>σ-ý</td>
</tr>
<tr>
<td>Acc</td>
<td>σ-ý</td>
<td>ó- σ</td>
<td>ó- σ</td>
</tr>
<tr>
<td>Instr</td>
<td>σ-σσ</td>
<td>σ-σ</td>
<td>σ-σ</td>
</tr>
<tr>
<td>Loc</td>
<td>σ-σ</td>
<td>σ-σ</td>
<td>σ-σ</td>
</tr>
<tr>
<td>Voc</td>
<td>ó- σ</td>
<td>ó- σ</td>
<td>ó- σ</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PLURAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nom</td>
</tr>
<tr>
<td>Gen</td>
</tr>
<tr>
<td>Dat</td>
</tr>
<tr>
<td>Acc</td>
</tr>
<tr>
<td>Instr</td>
</tr>
<tr>
<td>Loc</td>
</tr>
<tr>
<td>Voc</td>
</tr>
</tbody>
</table>
Although these patterns are complex, we are able to make generalizations about the type of cases that show unstable stress within each pattern which will be helpful to our analysis below.

The different kinds of cases affected can be seen in the diagrams below. The first diagram shows only vocative case affected by showing stress like the other forms of the plural:

(150) Pattern 2

Pattern 3 takes things one step further; vocative and accusative singular now show plural-like stress:

(151) Pattern 3

Finally, the most complex pattern is one where vocative and accusative singular show stress like the nominative plural, and the oblique cases of the plural show singular stress:

(152) Pattern 4

AND

Finally, the most complex pattern is one where vocative and accusative singular show stress like the nominative plural, and the oblique cases of the plural show singular stress:

(152) Pattern 4

AND
We can make some statements about the implicative relationships between the different types of patterns. The vocative singular patterning with the nominative plural does not imply any other cases also pattern with the plural. But if the accusative singular patterns with plural stress, then so does vocative singular, as in Pattern 3. And if there are plural oblique cases which pattern with the nominative singular, then the vocative and accusative singular pattern with nominative plural stress.

4.4.2.3 Analysis

Besides the obvious complexity of a pattern like Pattern 4, there are other difficulties in characterizing these types of unstable accent patterns. Different Ukrainian grammars often characterize different words into different categories of accentual patterns. For example, Holovashchuk 1995 (a guide to Ukrainian stress published by the Ukrainian literary press) gives the stem /kovbas/ ‘sausage’, which we saw earlier, as a word which follows pattern 3 above, whereas Bilodid 1969 and Peshchak 2001 give the accent as stable within the plural paradigm.

Recall that I made an important point when introducing the unstable patterns in section 4.2.1: there is no phonological difference between these stems and ones that are stable for stress between singular and plural paradigms. Nor is there a phonological difference between the different types of patterns. Thus there is nothing in terms of the vowels in the Pattern 3 accusative sg. [fiór-u] ‘mountain’ to distinguish its stress from the stress in a Pattern 2 accusative sg. like [vdov-ú] ‘widow’. The inflectional ending is the same in
both accusative singular forms, [-u]; the stem vowel [o] is likewise the same. There is also nothing which can be said about the stem-final consonant, for example; although the consonants are different in the examples above, there is no natural class which patterns a certain way. For example, /bid/ shows pattern 2, and /vod/ pattern 3:

<table>
<thead>
<tr>
<th>(153) /bid/ ‘bad fortune’</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nom</td>
<td>SG</td>
<td>PL</td>
</tr>
<tr>
<td>Gen</td>
<td>bid-á</td>
<td>bid-y</td>
</tr>
<tr>
<td>Dat</td>
<td>bid-ý</td>
<td>bid</td>
</tr>
<tr>
<td>Acc</td>
<td>bid-í</td>
<td>bid-am</td>
</tr>
<tr>
<td>Inst</td>
<td>bid-ú</td>
<td>bid-y</td>
</tr>
<tr>
<td>Loc</td>
<td>bid-óju</td>
<td>bid-amy</td>
</tr>
<tr>
<td>Voc</td>
<td>bid-í</td>
<td>bid-ax</td>
</tr>
<tr>
<td></td>
<td><strong>bid-o</strong></td>
<td><strong>bid-y</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(154) /vod/ ‘water’</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nom</td>
<td>SG</td>
<td>PL</td>
</tr>
<tr>
<td>Gen</td>
<td>vod-á</td>
<td>vód-y</td>
</tr>
<tr>
<td>Dat</td>
<td>vod-ý</td>
<td>vód</td>
</tr>
<tr>
<td>Acc</td>
<td>vod-í</td>
<td>vód-am</td>
</tr>
<tr>
<td>Inst</td>
<td><strong>vod-u</strong></td>
<td>vód-y</td>
</tr>
<tr>
<td>Loc</td>
<td>vod-óju</td>
<td>vód-amy</td>
</tr>
<tr>
<td>Voc</td>
<td>vod-í</td>
<td>vód-ax</td>
</tr>
<tr>
<td></td>
<td><strong>vod-o</strong></td>
<td>vód-y</td>
</tr>
</tbody>
</table>

Since both stems end in the same consonant, [d], we cannot say that a consonant characterizes a particular pattern of stress, Pattern 2 or 3; either can end in the same consonant. Thus there is no way to capture the phenomenon of instability within a paradigm by a phonological generalization. Neither is there a morphological class which characterizes any of the three patterns above.

---

48 Note that this example does not show the shift of /o/ to [i] word-finally; thus this is an example of a stem which was not followed by a jer vowel. (cf. Shevelov 1979 for discussion of the timing of this shift as evidence for when jers were deleted in Ukrainian.)
For the analysis proposed here, I will assume that the stems which show unstable stress must be lexically specified for the cases affected. Readers are referred to the next section for other possible analyses and problems therein. In this section, I assume that the 1st declension nouns in Ukrainian will have the accentual divisions “Patterns 1-4” and the members of each pattern will be indexed for that pattern.

The patterns 1-4 for the 1st declension nouns are as follows:

Pattern 1: All Plural patterns with Nom.Pl.
Pattern 2: All plural and Voc Sg patterns with Nom.Pl.
Pattern 3: All plural and Acc & Voc Sg pattern with Nom.Pl.
Pattern 4: Acc & Voc Sg pattern with Nom Pl; Dat, Inst, Loc Pl with Sg

The description above may be stated in more formal terms with feature-structure, especially when we note that all the ‘unstable’ cases are unstable for one of two reasons: either they are cases like the accusative and vocative which ‘depend’ on the nominative for their case marking, or they are the are non-direct, oblique cases. The vocative in Ukrainian always has the same ending as the nominative plural; thus grammarians like Zhovtobr’ux 1972 write that ‘the vocative takes on the nominative ending’. The accusative is another such nominative-dependent case. Inanimate 1st declension (and increasingly, 2nd declension) nouns are identical in case endings (or lack thereof) with the nominative in both plural and singular. Animate 1st declension nouns show identical case marking in the plural between accusative and genitive. Thus, there is evidence in Ukrainian to group the accusative and vocative cases as ‘weak’ cases which depend on another case for case marking:

(155)  [+weak] = accusative, vocative
This distinguishes these cases from other cases, which all have unique case markings. We can take this one step further and claim that ‘+ weak’ cases to depend on a base for stress, i.e. the genitive plural for the cases above. Thus the same cases which depend on the nominative for case endings can also depend on a base for stress, even where that base is in another number sub-paradigm:

(156)  [+weak]= base-dependent, member of Sy

But for some nouns, accusative is not [+weak] in this sense; we must mark these nouns for the vocative only. For example, Pattern 2 nouns show [+voc] only as a member of Sy, whereas in Patterns 3 and 4, both weak [+acc] and [+voc] are members of Sy.

In Pattern 4, the weak cases are affected by a plural base, but the [+dat], [+loc], [+instr] cases are not, showing stress as in the nominative singular. These can be grouped together as [+oblique]:

(157)  [+oblique]= locative, dative, instrumental

Then [+oblique] nouns can be specified as excluded from Sy, for Pattern 4 stems. Thus for each group of stems, the marking is:

(158)  Pattern 1:  Sy= [+plural]

        Pattern 2:  Sy= [+plural, +voc]

        Pattern 3:  Sy= [+plural, +weak]

        Pattern 4:  Sy= [+plural, +weak, -oblique]

Thus part of the lexical entry of these nouns will be the fact that they belong to a certain pattern, represented by indices like: /v dov1/ ‘widow’, /fior2/ ‘mountain’, /noh3/ ‘foot’,
etc. All 1st declension nouns without lexical accent will be thus indexed to show which cases are in the same ‘sub-paradigm’ as the base form.

This means that additional cases will be part of the sets for correspondence which previously only included either singular or plural forms. The correspondence relation in terms of sets given in Chapter 3 which relates the base and derivative forms is repeated below:

(159) \( z \in R x \iff \)

- \( z \) is an output member of \( S_1 \) ‘Base’
  \( S_1 = (S_y - O_y) \) set difference
- \( x \) is an output member of \( S_2 \) ‘Derivative’
  \( S_2 = S_y \) set of inflected forms in subparadigm

Pattern 1 is the uniform set of plural or singular that we saw earlier, where for the plural the plural cases are included, and for the singular, the singular cases:

(160) \( S_y \) for Pattern 1:

- \( S_{pl} = \{nom.pl, gen.pl, dat.pl, acc.pl, instr.pl, loc.pl, voc.pl\} \)
- \( S_{sg} = \{nom.sg, gen.sg, dat.sg, acc.sg, instr.sg, loc.sg, voc.sg\} \)

i.e. \( S_y = [+plural] \)

\( S_y \) in the case of Pattern 2 is not uniformly divided into \( y=sg \) or \( y=pl \) cases. For Pattern 2, \( S_{pl} \) includes all the plural forms and the vocative singular, and \( S_{sg} \) does not include the vocative:

(161) \( S_y \) for Pattern 2:

- \( S_{pl} = \{nom.pl, gen.pl, dat.pl, acc.pl, instr.pl, loc.pl, voc.pl, voc.sg\} \)
- \( S_{sg} = \{nom.sg, gen.sg, dat.sg, acc.sg, instr.sg, loc.sg\} \)

i.e. \( S_y = [+plural, +voc] \)
For Pattern 3, $S_{pl}$ also includes the accusative singular:

(162) $S_y$ for Pattern 3:

$S_y=\{\text{nom.pl, gen.pl, dat.pl, acc.pl, instr.pl, loc.pl, voc.pl, voc.sg, acc.sg}\}$

$S_{sg}=\{\text{nom.sg, gen.sg, dat.sg, instr.sg, loc.sg}\}$

i.e. $S_y= [+\text{plural, +weak}]$

For Pattern 4, $S_{pl}$ and $S_{sg}$ are as follows:

(163) $S_y$ for Pattern 4:

$S_{pl}=\{\text{nom.pl, gen.pl, acc.pl, voc.pl, voc.sg, acc.sg}\}$

$S_{sg}=\{\text{nom.sg, gen.sg, dat.sg, instr.sg, loc.sg, dat.pl, inst.pl, loc.pl}\}$

i.e. $S_y= [+\text{plural, +weak, -oblique}]$

Note that in all of the stems which are lexically specified for this type of case division, the base form is always in $S_{pl}$. That means that for a pattern like Pattern 4, the only cases which will be affected by the stem stress are the $S_{pl}$ cases listed in (163): nom.pl, gen.pl, acc.pl, voc.pl, voc.sg, acc.sg. The other case will not be affected by OO-faithfulness.

Let us consider a Pattern 3 stem like /vod/ ‘water’ step by step. The base form is established as the set difference between the overtly inflected forms and those without overt inflection:

(164) $S_{pl} - O_{pl}= \{\text{vod}, \text{gen.pl}\}$

This base receives stem stress by our constraint ranking:
(165) Pattern 3: /vod/ ‘water gen. pl.’

<table>
<thead>
<tr>
<th>/vod/</th>
<th>HEAD</th>
<th>DEP-STRESSSTEM</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) vód</td>
<td>*!</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b) vod</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Base stress is on the only available syllable, the stem syllable in (a).

The stem stressed \[vód\] then corresponds by OO-Faith to the other forms of the S_{pl} set, given below:


For Pattern 3, the vocative and accusative singular (and all cases in the plural) are part of S_{pl}, as we saw in (162). All of these cases shows OO-effects. So the vocative singular is a member of the set of forms which obey the special OO-DEP_{HD} constraint in the tableau below, where the indices show that the vocative singular follows a plural base in terms of stress:

(167) OOFAith: /vod+o/ ‘water voc. sg.’

<table>
<thead>
<tr>
<th>Base: [vód]_{pl}</th>
<th>/vod+o/_{pl}</th>
<th>OO-DEP_{HD}</th>
<th>DEP-STRESSSTEM</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) [vód]</td>
<td>vód+o</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b) [vód]</td>
<td>vod+ó</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Because /vod/ ‘water’ is a Pattern 3 stem, the vocative singular is affected by OO-faithfulness; if it were not listed as such, OO-DEP_{HD} would not apply. Thus (b) crucially violates OO-DEP_{HD}, and the violation of stem stress insertion is tolerated in (a), the optimal candidate.
All stems are therefore listed in the lexicon with indices for the cases according to which pattern with the base plural case and which do not. This means that the learner must learn these cases in different groups for stress assignment. OO-Faith will then affect those cases listed, and those cases only.

Cases not included in the same set as the plural base are unaffected by OO-DEP\textsubscript{HD}, just as the Post-stem stressing paradigm (which consists of polysyllabic 2\textsuperscript{nd} declension stems) is also unaffected. For example, the oblique plural cases in Pattern 4 are not part of S\textsubscript{pl}. The tableau for a noun like [noh-áx] ‘foot, loc.pl.’ which for purposes of stress is part of the S\textsubscript{sg} set, and is indexed as such below. (I include a potential base, the genitive plural [nífí], in the first column with a different index to show that a base cannot apply; OO-DEP\textsubscript{HD} is vacuously satisfied because the sg/pl indeces do not match.)

(168) / nofi-ax/ ‘foot, loc.pl.’

<table>
<thead>
<tr>
<th>BASE</th>
<th>/ nofi-ax\textsubscript{sg}</th>
<th>OO-DEP\textsubscript{HD}</th>
<th>DEP-STRESS\textsubscript{STEM}</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>nífí\textsubscript{pl}</td>
<td>*a\textsuperscript{a} nofi-áx</td>
<td></td>
<td>*!</td>
<td>*</td>
</tr>
<tr>
<td>nífí\textsubscript{pl}</td>
<td>*\textsuperscript{b} nófi-ax</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(168) shows that OO-DEP\textsubscript{HD} violations are not crucial and it is more important to satisfy DEP-STRESS\textsubscript{STEM}. Because (b) violates DEP-STRESS\textsubscript{STEM}, it is eliminated. (a) satisfies the same constraint by realizing stress on the inflection, and it is optimal. Therefore, in the locative plural, lack of inherent stem stress is maintained in the output; it is unaffected by genitive plural stem stress.
4.4.2.4 Other analyses

I present two alternatives to the analysis for unstable cases proposed above; each of these is grounded in alternative theories discussed in Chapter 3, a theory like Benua’s TCT which does explicitly require an overtly unaffixed base, and a theory like OP which assumes no base at all. Below I consider whether either theory offers any insights into the instability cases we saw above.

The problems which arise when we do not assume a strict definition of a base as an unaffixed form were outlined in Section 3.4. But let us assume such a theory for the purposes of exploring the unstable cases. Such a theory would allow overtly inflected, affixed forms to serve as bases for other forms. This at first appears to hold promise for the cases at hand, since we might be able to consider additional base forms and base-derivative relationships cross-paradigmatically, so that stress can extend across typical number boundaries. For example, consider again the paradigm again for a Pattern 2 stem like /vod/, this time highlighting the cases which are unexpectedly stem stressed in the singular, the accusative and vocative:

(169) /vod/ ‘water’

<table>
<thead>
<tr>
<th></th>
<th>SG</th>
<th>PL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nom</td>
<td>vod-á</td>
<td>vód-y</td>
</tr>
<tr>
<td>Gen</td>
<td>vod-ý</td>
<td>vód</td>
</tr>
<tr>
<td>Dat</td>
<td>vod-i</td>
<td>vód-am</td>
</tr>
<tr>
<td>Acc</td>
<td>vód-u</td>
<td>vód-y</td>
</tr>
<tr>
<td>Inst</td>
<td>vod-óju</td>
<td>vód-amy</td>
</tr>
<tr>
<td>Loc</td>
<td>vod-í</td>
<td>vód-ax</td>
</tr>
<tr>
<td>Voc</td>
<td>vód-o</td>
<td>vód-y</td>
</tr>
</tbody>
</table>
Since both the accusative and vocative show stem faith in both plural and singular, we might propose that the accusative and vocative plural cases are bases for the corresponding singular accusative and vocative cases in the singular respectively.

This has the apparent benefit of allowing these case to correspond in terms of OO-Faith cross-paradigmatically. We might then propose that the base and derivative must stress the same vowel, resulting in stem stress in both accusative and vocative for both numbers. That is, if the stress in the base and derivative in this case must be identical according to our OO constraint OO-IDENT[HIGH, ROUND]HD, stress would be disallowed on the inflection because of the differing quality of the vowel as in the tableau below. (I give the tableau with the caveat that this is actually an incorrect proposal.)


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) [vód-y]</td>
<td>vód+u</td>
<td>*!</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b) [vód-y]</td>
<td>vód+ú</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There are several problems with such an approach. First, our constraint ranking is actually DEP-STRESSSTEM >> OO-IDENT[HIGH, ROUND]HD, as established in section 4.2. So we would need a special constraint OO-IDENT[HIGH, ROUND]HD coindexed with the class of stems showing such instability to ensure that other stems are not affected. A more serious problem with such an approach is that for other paradigms other solutions must be proposed because an analysis using OO-IDENT[HIGH, ROUND]HD fails. For example, the oblique cases in the plural for /noh/ ‘foot’ in (147), repeated below, do not stress identical vowels:
A solution using the constraint \textsc{OO-IDENT}[\textsc{HIGH, ROUND}]_{HD} might stipulate that the oblique cases in the plural in this case were patterning with the nominative singular, which also stresses inflectional –a, but there is no reason to propose that the base in this case is nominative singular, and not some other form. Thus the problem with this approach is again that it becomes impossible to predict which forms are the base, and which are the derivative. Thus there is no benefit to using this approach to account for the instability of stress, since stipulations must be made for this approach as well. A final problem is that for the vocative case, \textsc{OO-IDENT}_{HD} is satisfied by both candidates:

\begin{table}[h]
\begin{tabular}{|c|c|c|}
\hline
\textbf{Base:} & /\textsc{vöd+o}/ & \textsc{OO-IDENT} [\textsc{HIGH, ROUND}]_{HD} & \textsc{DEP-STRESS}_{STEM} & \textsc{COINCIDE-R} \\
[\textsc{vöd-y}] & /\textsc{vöd+o}/ & \textsc{vöd+o} & *! & * \\
\hline
(a) [\textsc{vöd-y}] & /\textsc{vöd+o}/ & \textsc{vöd+o} & *! & * \\
\hline
\end{tabular}
\end{table}

The incorrect candidate is predicted in (171)(b) because there is no \textsc{OO} reason to avoid stem stress, so the candidate wins by satisfying \textsc{DEP-STRESS}_{STEM}. We would need some
other faithfulness constraint not assumed in our system thus far to make the correct predictions.

Finally, consider the OP model of stress in inflectional paradigms, where there is no base; instead, the entire paradigm is evaluated for stress. The same problems are encountered by an analysis of the instability cases in this system. Even if we try to propose some new OO constraint “OPFaith” (i.e. heads are identical in terms of correspondence and vowel quality) which works across number paradigms to bring together vocative singular and plural, for example, the system fails. It can only predict the accusative/vocative, and not the oblique cases. The paradigm with identical stress for vocative singular and plural would win as below:

(172) Hypothesis for OP-Faith

<table>
<thead>
<tr>
<th>/vod/ voc_{sp}, voc_{pl} ....</th>
<th>OP-FAITH</th>
<th>DEP-STRESSSTEM</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>{a} &lt; vódo, vódy...&gt;</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>{b} &lt; vodó, vódy...&gt;</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>{c} &lt; vodó, vody...&gt;</td>
<td>*</td>
<td>*</td>
<td>**</td>
</tr>
</tbody>
</table>

The (a) candidate is in fact the surface form of the singular and plural for the vocative.

But the oblique cases are not correctly predicted, as we see in tableau (173):

(173) Hypothesis for OP-Faith

<table>
<thead>
<tr>
<th>/noři/ loc_{sg}, loc_{pl} ....</th>
<th>OP-FAITH</th>
<th>DEP-STRESSSTEM</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>{a} &lt; nóži, nóňáx...&gt;</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>{b} &lt; nóži, noňáx...&gt;</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>{c} &lt;nozí, noňáx...&gt;</td>
<td>*</td>
<td>*</td>
<td>**</td>
</tr>
</tbody>
</table>

The forms predicted above are not the correct surface forms; the actual forms are those with stress on the inflectional endings, as in candidate paradigm (c). We would need
some other way to predict stress in those cases. There is no reason to choose this paradigm unless we stipulate that for these cases, OP Faith does not apply. Another possibility might be to propose inherently stressed affixes for the obliques cases: [-ám] dat.pl; [-ámy] inst.pl; [-áx] loc.pl. But these would then need to be stipulated as allomorphs of other identical affixes which are *not* stressed for other mobile stems. Again, we are faced with the same stipulations that required for the proposal in the previous section which extends basehood to overtly inflected forms. There is no reason to prefer either of these theories over the system proposed here in section 4.2; neither helps us to account for the instability cases we saw here.

4.5 CONCLUSION: UKRAINIAN STRESS

The crucial constraints for each pattern of stress in Ukrainian are summarized in the table below. The table shows the three main division: Fixed stem stress; Post-stem stress where stress is always on the suffix; Mobile Stress, where stress alternates between stem and suffix. Mobile stress is further divided into three groups according to the position of stress when in the stem. The last column shows the constraints that drive each pattern.
(174) Ukrainian singular ~ plural alternations
(Note numbers for each pattern except Fixed given in first column)

<table>
<thead>
<tr>
<th>Stress Pattern:</th>
<th>SG</th>
<th>PL</th>
<th>Gloss</th>
<th>Stem specified?</th>
<th>Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FIXED</strong></td>
<td></td>
<td></td>
<td></td>
<td>yes</td>
<td>Faithfulness: MAX-STRESS</td>
</tr>
<tr>
<td>bál</td>
<td>bál-y</td>
<td>point/measure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>kúlyk</td>
<td>kúlyk-y</td>
<td>sheaf</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>deržáv-a</td>
<td>deržáv-y</td>
<td>government</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>POST-STEM (296)</strong></td>
<td></td>
<td></td>
<td></td>
<td>no</td>
<td>IO-Faithfulness: DEP-STRESSSTEM and Coincide-R</td>
</tr>
<tr>
<td>fiarbúz</td>
<td>fiarbuz-ý</td>
<td>pumpkin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lyžvar</td>
<td>lyžvar-ý</td>
<td>skier</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MOBILE</strong></td>
<td></td>
<td></td>
<td></td>
<td>no</td>
<td>OO-Faith and Coincide-L</td>
</tr>
<tr>
<td>M1 (171)</td>
<td></td>
<td></td>
<td></td>
<td>no</td>
<td>OO-Faith and Coincide-L</td>
</tr>
<tr>
<td>vysot-á</td>
<td>vysót-y</td>
<td>height</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>kovbas-á</td>
<td>kovbás-y</td>
<td>sausage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2 (32)</td>
<td></td>
<td></td>
<td></td>
<td>no</td>
<td>OO-Faith and Coincide-L</td>
</tr>
<tr>
<td>suffix</td>
<td>suffix-y</td>
<td>fuse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>skovorod-á</td>
<td>skovorod-y</td>
<td>frying pan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M3 (223)</td>
<td></td>
<td></td>
<td></td>
<td>no</td>
<td>OO-Faith</td>
</tr>
<tr>
<td>vík</td>
<td>vík-ý</td>
<td>age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>firim</td>
<td>firim-ý</td>
<td>thunder</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The ranking of the constraints noted above is:
(175) **SUMMARY RANKING**

\[
\begin{align*}
\text{HEAD} & \mid \\
\text{OO-DEP}_{\text{HD}} & \mid \\
\text{DEP-STRESS}_{\text{STEM}} & \mid \\
\text{COINCIDE-R (STRESS, STEM)} & \\
\text{COINCIDE-L (STRESS, STEM)} & \\
\end{align*}
\]

The ranking of all constraints is:

(176) **ALL CONSTRAINTS**

\[
\begin{align*}
\text{HEAD} & \mid \\
\text{OO-DEP}_{\text{HD}} & \mid \\
\text{DEP-STRESS} & \mid \\
\text{DEP-STRESS}_{\text{STEM}} & \mid \\
\text{CULMINATIVITY} & \mid \\
\left\{ \text{MAX-STRESS}_{\text{STEM}} \right\} & \mid \\
\left\{ \text{NO-FLOP,} \right\} & \mid \\
\left\{ \text{OO-IDENT(HIGH, ROUND)}_{\text{HD}} \right\} & \\
\text{COINCIDE-R (Stress, stem)} & \\
\text{COINCIDE-L (Stress, stem),} & \\
\text{NONFINALITY} & \\
\end{align*}
\]

The OO-Faith constraint applies only to Mobile stems because these are stems with uninflected forms in the plural, or monosyllabic stems with uninflected forms in the singular. We will see in the final chapter which follows that there are some differences between Mobile patterns in Ukrainian and Russian. But the connection between uninflected forms and Mobile stems is also important in Russian.
Chapter 5
Russian stress in Nominal Inflection

5.1 INTRODUCTION

The core of the argument for Russian stress rests on the analysis for the somewhat less complex system of mobile stress patterns in Ukrainian presented in preceding chapters. The Ukrainian analysis gives us a starting point for the Russian analysis, and helps us see what otherwise might not be as obvious were we to consider Russian in isolation. Much of nominal inflectional stress in Russian appears to be idiosyncratic in previous accounts of Russian. (Some such accounts are summarized in section 5.3.)

This is especially true for the explanation of stem stress in Mobile stress patterns, where a regularity of the pattern in Russian has until now never been noted: all Mobile stems show a member of the paradigm without overt inflection, as in Ukrainian. I propose that in Russian, as in Ukrainian, this overtly uninflected member of the paradigm acts as a base for the rest of the forms in the same number sub-paradigm.

The paradigm uniformity effects are more obvious in Ukrainian, where the presence of an overtly uninflected member always predicts paradigm uniformity; this is not the case in Russian. This is because class restrictions for Ukrainian proposed earlier are phonological whereas Russian restrictions in this chapter will also need to refer to morphological class. But the generalization that all stem stress in M patterns occurs in paradigms with members without inflection holds, and is an important one. It allows us to explain these unusual patterns as a result of Output-Output Faithfulness.
The system I propose for Ukrainian is extended in this section to Russian; as we will see, the proposals in Section 5.2 shed new insights into the complexities of Russian nominal stress. In the previous chapters, our system distinguished faithfulness constraints at the input and output levels to account for the post-stem stressing and mobile stress patterns in Ukrainian. Faithfulness to the lack of stress predicts post-stem stressing nouns in Ukrainian, and faithfulness to a zero member of the paradigm ensures mobile stress in Ukrainian. These generalizations hold for the Russian stress patterns analysed below.

But there are distinct patterns of stress in Russian which do not exist in Ukrainian. Specifically, there are classes of nouns which show initial stress in Russian, whereas the pattern is not as robust in Ukrainian. Thus I extend the generalizations for Ukrainian to Russian and show how most of the stress patterns are accounted for by the system as proposed thus far. The new initial stress patterns in Russian are a result of the special ranking of one constraint: Coincide-Left.

Finally, since Russian stress has received much more attention in non-Slavic linguistic literature than Ukrainian, the linguistic literature provides a context in which we can evaluate my proposal. The final section discusses the crucial differences between my proposal for Russian and that of several accounts of Russian stress, especially Alderete 1999, Brown et al 1996, Halle 1973, 1997, and Revithiadou 1999.
Since my aim is to consider the patterns of stress with respect to those in Ukrainian, I will label accentual patterns in Russian as I did for Ukrainian, so that:

(177) Stress patterns: Russian and Ukrainian

- F Stress
  Fixed Stress: Stress is fixed on the same syllable throughout the paradigm

- P Stress
  Post-Stem Stress: Stress falls on the inflectional ending where there is one; otherwise stress is stem-final

- M Stress
  Mobile Stress: Stress shifts between stem and inflectional position between singular and plural paradigms

5.2 FIXED AND POST-STEM STRESS

As in Ukrainian, most Russian stems show fixed stress. Halle 1973 cites Zaliznjak 1967, whose study shows 92% of Russian noun stems have fixed stress on a stem syllable. The remaining stems, although few, are the focus of Halle’s and others’ inquiries into Russian. Also as in Ukrainian, the problem is discerning post-stem stress and stems with mobile accent which shifts between inflection and stem. (See section 5.2.1 for the various labels given to these stress patterns in the Russian literature.) This section shows that our account thus far provides the same analysis for Russian as for Ukrainian so that post-stem stress is a result of faithfulness to an input lack of stem stress. An analysis of the mobile cases follows in section 5.2.

Russian Fixed stem stress, just like in Ukrainian, is a result of Faithfulness to lexical specification of stress. I follow recent accounts of Russian (c.f. Ildsardi 1992, Halle 1997, Alderete 1999, Revithiadou 1999, and others) in assuming that some stems are
underlyingly specified for stress while others are not. Halle 1997, for example, calls the
Fixed pattern stems with “Fixed stress on a stem syllable [accented]”, and supplies these
stems with a parenthesis in the lexical representation (see section 5.3.1 for details).
Alderete 1999 marks these stems with input prominence in the lexicon, and ranks the
MAX constraint which refers to these prominences high in his system for Russian.
Similarly to Alderete 1999, in this account Fixed stress forms are always specified for
stress in the input and always realize that stress by MAX related to stress, as we saw in
Chapter 2, repeated below:

\[(178) \text{MAX-STRESS (after Alderete 1995)}\]
\[\begin{align*}
\text{For } x & \text{ stress, } \forall x \exists x' \ [x \in S_1 \implies x' \in S_2 \& xRx'] \\
\text{Every stress prominence in the input must have a correspondent in the output.}
\end{align*}\]

This constraint ensures that stress will remain on the input stem syllable (in the same
position, cf 2.4) for Russian noun stems which are specified for stress in the input, eg. the
stem /jagod/ ‘berry’:

\[(179) \text{Russian Fixed stress : /jagod/ ‘berry’ (2nd decl. feminine)}\]

<table>
<thead>
<tr>
<th>Nominative</th>
<th>Genitive</th>
<th>Dative</th>
<th>Accusative</th>
<th>Instrumental</th>
<th>Locative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sg</td>
<td>jágod-a</td>
<td>jágod-i</td>
<td>jágod-e</td>
<td>jágod-øj</td>
<td>jágod-e</td>
</tr>
<tr>
<td>Pl</td>
<td>jágod-i</td>
<td>jágod</td>
<td>jágod-am</td>
<td>jágod-am</td>
<td>jágod-ax</td>
</tr>
</tbody>
</table>

Thus for a stem with fixed stress like the one in (179), stress is realized on the same stem
syllable even when there is an inflectional ending. We see the ranking of constraints
which predicts this for nominative singular example in tableau (180):
Candidate (a) is optimal because it satisfies MAX-STRESS; all of the other candidates violate MAX-STRESS by deleting stress from the input vowel (cf. section 2.4 for a similar case in Ukrainian showing candidates with shifting stress; these are eliminated by No-Flop).

The stress likewise remains on the initial syllable for a stem like /jágod/ in the genitive plural unaffixed form in tableau (181):

As long as the constraint which licenses stress at the rightmost edge of the stem, Coincide-Right, is ranked below Max-Stress, candidate (a) is optimal, violating no other constraints like (b), which satisfies Coincide-Right but violates stress faithfulness. I will consider this form again in section 5.3 below, which examines Post-stem stressing nouns. These also show no affixation in the genitive plural but realize stress at the rightmost edge.

The constraint ranking established in Chapter 2 for Ukrainian Fixed stems, which shows that MAX-STRESS is crucially ranked above Coincide-Right, holds for Russian:
Constraint ranking: predicts Russian F pattern

\[
\text{MAX-STRESS} \\
\text{COINCIDE-R (STRESS, STEM)}
\]

Post-stem stress is the next most prevalent pattern in Russian, as in Ukrainian. An example is /stol/ ‘table’:

(183) Russian Post-stem stress : /stol/ ‘table’ (1st decl. masculine)

| Nominative | Sg | stól | Pl  |
| Genitive   | stol-á | stol-i |
| Dative     | stol-ú | stol-óv |
| Accusative | stól  | stol-ám |
| Instrumental | stol-óm | stol-i |
| Locative   | stol-é  | stol-ámi |

Halle 1997 recognizes this group of stems as the ‘postaccenting’ stems; he proposes that they are also accents but of a different kind than Fixed stems, these ‘being marked…after the last stem syllable’. That is, these stems are marked in the lexicon in Halle’s account with a special accent, after the last syllable.

In this proposal, the pattern of stems is predicted by a lack of stress in the input (not a different kind of inherent accent), and faithfulness to this lack of stress by the relativization of STRESS-DEP to stem position. This remains unchanged for Russian, and predicts P stress as in the genitive singular form for /stol/ below:
Candidate (c) loses because Russian words, like Ukrainian words, need stress (cf. Chapter 2, section 2.2) The DEP-STRESS\textsubscript{STEM} constraint, relativized to stem position as it was for Ukrainian (cf. section 2.5.2), decides between (a) and (b). Since candidate (a) satisfies DEP-STRESS\textsubscript{STEM}, it is the optimal candidate.

Thus Post-stem stress is predicted in Russian here the same way as in Ukrainian, by specifying these stems as having no stress underlingly and requiring faithfulness to that lack of stress. There is no need for special marking of these stems in the input. The ranking of constraints for Ukrainian holds for Russian, and is repeated below:

(185) Russian constraint ranking:

\[
\begin{align*}
\text{HEAD} & \quad \text{DEP-STRESS}\textsubscript{STEM} & \quad \text{MAX-STRESS} \\
\text{COINCIDE-R (STRESS, STEM),} & \quad \text{NONFINALITY} & \\
& \quad \text{COINCIDE-L (STRESS, STEM)}
\end{align*}
\]

Note that the constraint NONFINALITY plays the same role in Russian as in Ukrainian.

Russian nominal affixes of more than one syllable are always stressed on the first syllable of the suffix, as in Ukrainian: e.g. the instrumental plural, when stressed, always arises
with stress as [-ámi] in Russian, like in Ukrainian. This is because NONFINALITY
precludes final accents for suffixes (cf. section 2.5.2).

The low ranking of the COINCIDE-LEFT (STRESS, STEM) constraint also reflects the same
facts in Russian and in Ukrainian. In Ukrainian, this constraint predicted that no P stem
paradigms would arise with initial stress in the nominative singular (cf. section 2.5.3).
The same is true in Russian; there are no attested paradigms with initial stress in the
nominative singular, and inflectional stress throughout the rest of the paradigm. When P
stress occurs, it always shows inflectional stress if there is an inflectional ending, and
rightmost stem stress when there is no ending. The ranking above correctly predicts this,
in both Ukrainian and Russian. Having established that the ranking for Ukrainian also
accounts for Russian Fixed and Post-stem stress, let us consider the more complex cases
of Mobile stress.

5.3 MOBILE STRESS

The difference between Russian and Ukrainian is in the mobile pattern M. Recall that in
Ukrainian, we saw three distinct Mobile patterns:

(186) Ukrainian Mobile stress patterns (stress shifts for sg/pl between stem and
inflection)
   (i) M1: Sg. inflectional stress Pl. stem-final stress
   (ii) M2: Sg. inflectional stress Pl. stem-initial stress
   (iii) M3: Sg. stem stress Pl. inflectional stress

The most important difference between Russian and Ukrainian is found in the M3
pattern. In Ukrainian, this pattern shows predominantly monosyllabic forms, with no
distinction between stem initial and final position. (The monosyllabic stems which show
this pattern cannot be classed as either initial or final stressing in Ukrainian; both positions are possible. See Data section for examples.) In Russian, M3 stem stress is always initial. This is the only pattern which will necessitate new constraints for Russian, since the rest of the Mobile patterns fall out nicely from our analysis for Ukrainian.

5.3.1 Description

The table below summarizes the differences between Russian and Ukrainian mobile patterns. Note that each of the Russian groups is divided into (a) and (b) groups, with each of the (b) patterns showing with an additional case differences (i.e. with accusative singular differences in M1-2, and nominative plural difference in M3.) The final column notes discrepancies among different accounts for Russian: A=Alderete 1999; B=Brown et al 1996; H=Halle 1973; R=Redkin 1971.

(187) Russian Mobile Patterns

<table>
<thead>
<tr>
<th>c.f.Ukr:</th>
<th>Russian</th>
<th>SING STRESS:</th>
<th>PL STRESS:</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M1</strong></td>
<td>M1 (a)</td>
<td>inflection (all sg.)</td>
<td>stem final (all pl.)</td>
<td>Plural labeled ‘initial’ where monosyllabic by B,H.</td>
</tr>
<tr>
<td><strong>M1</strong></td>
<td>(b)</td>
<td>inflection (excl. acc.sg.)</td>
<td>stem final (all pl. + acc.sg.)</td>
<td></td>
</tr>
<tr>
<td><strong>M2</strong></td>
<td>M2 (a)</td>
<td>inflection (all sg. + gen, obl. pl)</td>
<td>stem initial (nom. pl, gen.pl, acc. pl)</td>
<td>Excluded entirely by A; P stress in B, R; H excludes acc.pl; Gen.pl: stem-initial or final, cf. section 5.3.2.2</td>
</tr>
<tr>
<td><strong>M2</strong></td>
<td>(b)</td>
<td>inflection (excl. acc.sg.)</td>
<td>stem initial (nom. pl, gen.pl, acc. pl + acc.sg)</td>
<td></td>
</tr>
<tr>
<td><strong>M3</strong></td>
<td>M3 (a)</td>
<td>stem-initial (all sg.)</td>
<td>inflection (all pl.)</td>
<td></td>
</tr>
<tr>
<td><strong>M3</strong></td>
<td>(b)</td>
<td>stem-initial (all sg. + nom.pl)</td>
<td>inflection (excluding nom.pl)</td>
<td></td>
</tr>
</tbody>
</table>
We see immediately from the above chart that the Russian type of case instability within mobile patterns is different from type of unstable cases we saw in Ukrainian. In Ukrainian, case instability arises only in the M1 group. In section 4.3, we saw how a base effect could be extended to a derivative in a different number paradigm. For example, the vocative and accusative singular in some Ukrainian stems like /vod/ ‘water’ are lexically specified as members of the set of forms affected by the genitive plural base form. This particular case is similar to the Russian M1(b) pattern above. There is no vocative case in Russian, so the accusative singular is the only singular case affected by a plural base, as we will see below. Notably, no plural cases are excluded from the M1 pattern, as the oblique cases were in Ukrainian for some stems, but there are plural cases which are excluded from other patterns in Russian, like those in pattern M2. The analysis below includes the sets which are necessary to predict both (a) and (b) forms of Mobile stress for Russian, with the simpler (a) patterns presented first.

5.3.2 Analysis

In the next three sections, I show how the analysis proposed for Ukrainian accounts for most of the Russian patterns M1-M3. The main difference between Ukrainian and the new Russian data is the re-ranking a special Coincide-Left constraint which accounts for the prevalence of initial stress in some of the Russian mobile patterns.

5.3.2.1 Mobile Pattern M1

As in Ukrainian, Russian pattern M1 shows stress so that the singular inflectional stress contrasts with plural stem-final stress. This pattern is sometimes called ‘retracted’ stress
in the Russian literature, since the plural stress appears to retract one syllable away from
the inflectional stress of the singular. For Ukrainian, the system showed that a base
without overt inflection in the plural sub-paradigms lead to OO-Faith in the rest of plural
paradigm. The same holds for the cases of Russian M1 stress.

The Russian stems showing M1 are predominantly feminine a-stems (Redkin cites 12
masculine stems & 104 feminine stems). These a-stems are called 1st declension in
Ukrainian, but 2nd in Russian. The Russian example below is a cognate of the Ukrainian
/kovbas/ ‘sausage’ example in Chapter 3; the Russian stem is /kolbas/ ‘sausage’:

(188) Russian M1 : /kolbas/ ‘sausage’

<table>
<thead>
<tr>
<th></th>
<th>Sg</th>
<th>Pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominative</td>
<td>kolbas-á</td>
<td>kolbás-i</td>
</tr>
<tr>
<td>Genitive</td>
<td>kolbas-í</td>
<td>kolbás-am</td>
</tr>
<tr>
<td>Dative</td>
<td>kolbas-é</td>
<td>kolbás-í</td>
</tr>
<tr>
<td>Accusative</td>
<td>kolbas-ú</td>
<td>kolbás-am</td>
</tr>
<tr>
<td>Instrumental</td>
<td>kolbas-ój</td>
<td>kolbás-ami</td>
</tr>
<tr>
<td>Locative</td>
<td>kolbas-é</td>
<td>kolbás-ax</td>
</tr>
</tbody>
</table>

The analysis for Russian /kolbas/ is the same as for Ukrainian /kovbas/. The Russian case
follows from the following three principles, outlined in detail for Ukrainian M1 stems in
section 3.1:

- **DEP-STRESSSTEM** satisfied by Singular Inflectional stress *i.e. avoid stressing stem in
  the singular paradigm by stressing inflectional endings*

- **COINCIDE-RIGHT** satisfied and **DEP-STRESSSTEM** necessarily violated by affixless forms
  *i.e. stress on genitive plural (overtly uninflected form) is rightmost.*
OO-Faith: Plural Base predicts rest of Plural Derivatives i.e. affixless Gen.Pl is base; stem stress extended to other plural forms in set $S_{pl}$.

Note also that /kolbas/ ‘sausage’ is one of the M1(a) group of stems, showing a clear division between singular and plural sub-paradigms for stress assignment:

(189) M1(a) group

$S_{SG} =$ {nom, gen, etc….} all singular cases

$S_{Pl} =$ {nom, gen, etc….} all plural cases

The mobile stress of a stem like /kolbas/ is predicted by virtue of the genitive plural being uninflected. This qualifies /kolbas/ gen.pl. as the lone member of the set difference, the difference between all forms in the plural, i.e. members of $S_{Pl}$, and all overtly inflected forms of the plural, members of $O_{Pl}$:

(190) Set difference: Plural

$S_{Pl} - O_{Pl} =$ {kolbas}

The base thus established enters into a correspondence relation with the derivatives: all the members of the set $S_{Pl}$, which in this case are all the members of the plural paradigm (since the stem is not specially marked in the lexicon for other members like the accusative singular.)

Note that in Russian, as for Ukrainian, in the M1 pattern there is never a base in the singular sub-paradigm because there is no member of the singular set difference:
(191) Set difference: Singular

\[ S_{\text{Sg}} - O_{\text{Sg}} = \emptyset \]

Thus there is no singular base, and no possible correspondence relation between a base and derivative in the plural.

But unlike Ukrainian, not all stems in Russian which have an overtly uninflected form like \([\text{kolbáš}]\) in the plural paradigm show OO-Faith effects like /kolbas/ ‘sausage’ does. That is, a form without overt inflection does not always predict paradigm uniformity in the plural, as it does for Ukrainian. An example of a noun not showing OO Faith where we expect it is /bulav/ ‘staff’, which instead shows Post-stem stress:

(192) Russian P stem: /bulav/ ‘staff’

\[
\begin{array}{l|l}
\text{Nom} & \text{SG} \\
\text{Gen} & \text{bulav-á} \\
\text{Dat} & \text{bulav-é} \\
\text{Acc} & \text{bulav-ú} \\
\text{Instr} & \text{bulav-ój} \\
\text{Loc} & \text{bulav-é} \\
\end{array}
\quad
\begin{array}{l|l}
\text{PL} & \text{bulav-í} \\
\text{} & \text{buláv} \\
\text{} & \text{bulav-ám} \\
\text{} & \text{bulav-í} \\
\text{} & \text{bulav-ámi} \\
\text{} & \text{bulav-áx} \\
\end{array}
\]

Given the analysis thus far, we would predict that the form for genitive plural, shown in bold above, should serve as a base for the rest of the plural paradigm since it lacks overt inflection and is capture by our definition of a base as the set difference between \( S_{\text{Pl}} - O_{\text{Pl}} \).

Before explaining why the stem in (192) is a P stem, and not a mobile stem in Russian, consider the same stem in Ukrainian, where we do see Mobile stress\(^49\):

\[^{49}\text{I show cognates in this section to illustrate the stress contrast between Russian and Ukrainian, but I do not imply that Ukrainian and Russian stems show stress differences alone. The two languages show different lexical entries in many cases.}\]
The crucial difference is that in Ukrainian the uninflected base, [buláv] gen.pl. drives stem stress in the Ukrainian plural, as we expect, whereas in Russian, the stem remains a Post-stem stressing noun, with no OO-effects evident. There were 21 neuter exceptions to the phenomenon of paradigm uniformity in Ukrainian, as we saw in section 3.4. These stems were treated as exceptions due to their relative paucity, but we cannot treat the Russian stems in the same way. Redkin cites 122 ‘a-stems’ with unaffixed genitive plural forms that show post-stem stress in the plural (where we would expect M1 type stress by our analysis thus far). Thus the Russian stems like /bulav/ show that OO-Faith is not as robust a phenomenon in Russian as in Ukrainian.

I propose that for Russian, unlike Ukrainian, there is a morphological condition on stems affected by OO Faith; these are the stems which show Mobile stress, stems like /kolbas/ ‘sausage’ in (188). These stems are indexed as a special class, ‘B’, for “Base-dependent” stems (i.e. the uninflected form for this class does act as a ‘Base’). The unmarked case results in Post-stem stressing stems; but some stems are marked as B stems:

<table>
<thead>
<tr>
<th>Case</th>
<th>Ukrainian M stem: /bulav/ ‘staff’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nom</td>
<td>bulav-á</td>
</tr>
<tr>
<td>Gen</td>
<td>bulav-ý</td>
</tr>
<tr>
<td>Dat</td>
<td>bulav-í</td>
</tr>
<tr>
<td>Acc</td>
<td>bulav-ú</td>
</tr>
<tr>
<td>Loc</td>
<td>bulav-í</td>
</tr>
<tr>
<td>Instr</td>
<td>bulav-oju</td>
</tr>
<tr>
<td>Voc</td>
<td>bulav-ó</td>
</tr>
<tr>
<td>PL</td>
<td>buláv-y</td>
</tr>
<tr>
<td></td>
<td><strong>buláv</strong></td>
</tr>
<tr>
<td></td>
<td><strong>buláv-y</strong></td>
</tr>
</tbody>
</table>
Proposal for Russian:

OO-Faithfulness affects only a certain class of stems, indexed as ‘B’

The same paradigmatic characteristic, i.e. a form without overt inflection, still explains Mobile stress in Russian. But a Russian stem must be lexically specified as a ‘B’ stem for the uninflected form to act as a base:

Correspondence in Russian:

\[ z \in R x \text{ IFF:} \]

\[ z \in S_1 \quad \text{‘Base’} \]

\[ S_1 = (S_y - O_y) \quad \text{set difference} \]

\[ z = \text{B stem} \]

\[ x \in S_2 \quad \text{‘Derivative’} \]

\[ S_2 = S_y \quad \text{set of inflected forms in sub-paradigm} \]

Note that the ‘B stem’ morphological condition on the base in Russian replaces the conditions ‘[+plural] or [+monosyllabic]’ in Ukrainian\(^{50}\). In Russian, there is no such phonological conditioning of stems which show OO-Faith; instead, it is a special morphological class, specified as such in the lexicon, which shows OO-Faith. But the identification of a base within this class is the same as for Ukrainian: it is the member of the set difference between all forms and all overtly inflected forms. This isolates the uninflected form of the paradigm as the base form, as in Ukrainian.

Consider the indexed stem /kolbas\(_B\)/ with the ‘B’ index showing its Base-dependent status. The genitive plural is the base by Set Difference in the plural sub-paradigm:

\(^{50}\) Recall the other possibility for Ukrainian: that rather than a condition of faithfulness, we can specialize the OO Faith constraint so that the special constraint affects only those mobile stems. We can do the same for Russian here as well.
Set Difference: Plural
\[ S_{PI} - O_{PI} = \{\text{kolbas}_B \text{ gen.pl.}\} \]
Set difference: Singular
\[ S_{Sg} - O_{Sg} = \emptyset \]

Thus the plural has a base; base stress is assigned by rightmost default: [kolbás]. The base corresponds to other plural forms like the nominative plural:

(197) **Russian OO-Faith**: /kolbas\(_B\)/ ⇒ [kolbas\(\text{i}\)] nominative plural

<table>
<thead>
<tr>
<th>Base [kolbás]</th>
<th>/kolbas+i/</th>
<th>OO-DEPHD</th>
<th>DEP-STRESSSTEM</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) kolbás</td>
<td>kolbás-i</td>
<td>*!</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>(b) kolbás</td>
<td>kolbas-i</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>(c) kolbás</td>
<td>kólbas-i</td>
<td>*</td>
<td>*</td>
<td>*!</td>
</tr>
</tbody>
</table>

Since /kolbas\(_B\)/ is indexed for a potential base-derivative relation, and the base is the genitive plural [kolbás] with stem stress, the nominative plural must obey OO-Faith, also showing stem stress. Since (b) violates OO-Faith, it is eliminated. Of the remaining two candidates, the rightmost stem stress in (a) is optimal.

Other stems like /bulav/ ‘staff’ in Russian are not thus indexed as B stems. Thus even though they have forms which could act as bases in a plural paradigm, they do not show OO-Faith effects. For a stem like /bulav/, no such Base-index exists. There is an overtly uninflected genitive plural form which shows stem-final stress by Coincide-Right, as expected:

(198) /bulav/ ‘staff gen. pl.’

<table>
<thead>
<tr>
<th>/bulav/</th>
<th>HEAD</th>
<th>DEP-STRESSSTEM</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) buláv</td>
<td>*</td>
<td>*</td>
<td>*!</td>
</tr>
<tr>
<td>(b) búlav</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c) bulav</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
DEP-STRESS\textsubscript{STEM} is necessarily violated in the optimal form because all words in Russian must have stress by HEAD. The genitive plural shows stem stress as in (a), winning over initial stress in (b) by COINCIDE-R.

Because this stem is not indexed as a B stem obeying OO-Faith, the genitive plural cannot act as a base. It does not fulfill the condition (195) that bases must be B stems; \( z \neq B \) in this case. Therefore there is no base-derivative relationship and the special OO-Faith constraint is inactive in the candidate competition: The same constraints are active for the nominative plural as for the genitive plural:

(199) Russian OO-Faith inactive: [bulav-i] ‘staff nom.pl.’

<table>
<thead>
<tr>
<th>/bulav+i/</th>
<th>OO-DEP\textsubscript{HD}</th>
<th>DEP-STRESS\textsubscript{STEM}</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) buláv-i</td>
<td>!</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b) bulav-î</td>
<td>!</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(c) búlav-i</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The optimal candidate is (b) which shows on the inflectional ending. This is because the OO constraint OO-DEP\textsubscript{HD} is vacuously satisfied, since there is no base-derivative relationship in this case: the stem is not marked as a B stem, so OO-Faith is inactive. DEP-STRESS\textsubscript{STEM} is satisfied by candidate (b), and crucially violated by the other two candidates, since (b) is the only candidate which resists stem stress.

In Ukrainian, there are no such morphological restrictions to a B class for OO-Faith; OO-Faith is active as long as there is an overtly uninflected member of the paradigm (and, in the case of M3, a monosyllabic stem.) In Russian, unlike Ukrainian, the characteristic of an zero form in the plural sub-paradigm does not always trigger mobile stress. Mobility
in Russian is restricted to specially marked stems. OO-Faith is active if a certain stem not only has the characteristics of being a member of the set difference between all and overtly inflected stems, as in Ukrainian, but also is a member the ‘B’ stem class. Otherwise, OO-Faith is not active, and we have the regular Post-stem stress throughout the singular and plural paradigms.

The particular M1 pattern we have just seen can be stable in Russian as for /kolbas/ which shows $S_{sg}=$all singular forms and $S_{pl}=$all plural forms. But other M1 stems, like Ukrainian, show case instability in Russian (ie. do not always strictly separate singular and plural sub-paradigms in terms of mobile stress assignment.) The (b) group of stems in the M1 Russian pattern show the accusative singular as part of the plural set:

(200) M1(b) ‘sg’/’pl’ membership

$$S_{SG} = \{\text{nom.sg, gen.sg, dat.sg, instr.sg, loc.sg}\}$$

$$S_{PL} = \{\text{nom.pl, gen.pl, acc.pl, dat.pl., instr.pl., loc.pl., acc.sg}\}$$

Thus when OO-Faith applies, it derives base-like stem stress in all of the forms of $S_{PL}$, including the accusative singular. We see this in the accusative singular form for /duʃ]/ ‘soul’, an M1(b)-type stem, where the accusative singular is derived from the genitive plural base [dúʃ] ‘soul’:

(201) Russian M1(b): /duʃ/u/ $\Rightarrow$ [dúʃ]-u accusative sg.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$\varphi$ (a) dúʃ</td>
<td>dúʃ-u</td>
<td>*!</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b) dúʃ</td>
<td>duʃ-ú</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Since this stem specifies that the accusative singular is also part of the $S_{PL}$ set, it too is affected by the stress in the genitive plural base $[dúf]$. Thus the optimal candidate is (a) because it satisfies the OO-Faith constraint $OO-Dep_{PlHd}$.

Both the accusative singular and the base genitive plural forms are members of $S_{PL}$, so they are related by base-derivative correspondence. Hence candidate (a) is optimal because it satisfies the OO constraint, realizing stem stress like the base form.

5.3.2.2 Mobile Pattern M2

This is the pattern which shows inflectional stress in the singular, and stem-initial stress in some case of the plural and/or accusative singular in Russian. M2 stress in Russian is similar to the M2 pattern we saw in Ukrainian in that inflection varies with stem-initial position. With our morphological condition on OO faith in Russian, all of the Russian M2 stems are ‘B’ stems. (I assume all the examples from now on are ‘B’ stems and index them as such in the tableaux in this section.)

The difference between M2 patterns of stress in Russian and Ukrainian is the membership of the $S_{PL}$ set. Some Ukrainian stems showed all plural cases as members of the plural set $S_{Pl}$; in other forms, the particular cases had to be specified, and there were three different types of unstable patterns. In Russian, it is never the case that all plural cases show stem stress in the plural; only nominative, genitive, and accusative cases are allowed as members of $S_{PL}$ Russian:
The M2(a) pattern is clear in the stem /gub/ ‘lip’ below:

(203) Russian M2(a) type

<table>
<thead>
<tr>
<th>Nom</th>
<th>SG</th>
<th></th>
<th>PL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>gub-á</td>
<td>gúb-i</td>
<td></td>
</tr>
<tr>
<td>Gen</td>
<td>gub-í</td>
<td>gúb</td>
<td></td>
</tr>
<tr>
<td>Dat</td>
<td>gub-é</td>
<td>gub-ám</td>
<td></td>
</tr>
<tr>
<td>Acc</td>
<td>gub-ú</td>
<td>gúb-i</td>
<td></td>
</tr>
<tr>
<td>Instr</td>
<td>gub-ój</td>
<td>gub-ámi</td>
<td></td>
</tr>
<tr>
<td>Loc</td>
<td>gub-é</td>
<td>gub-áx</td>
<td></td>
</tr>
</tbody>
</table>

Only the nominative, genitive, and accusative plural forms show stem stress in the M2(a) type paradigm. Thus, only those cases are part of $S_{PL}$, the set whose members show base-derivative relationships; the genitive uninflected base affects only nominative and accusative forms by OOFaith. This difference between Ukrainian and Russian is captured by the fact that there are fewer members of the $S_{PL}$ set in Russian.

A more significant difference between Russian and Ukrainian M2 stress is that in Russian, we do not see the vowel difference between nominative and genitive forms as in Ukrainian. In Russian, there is no stem-final vowel shift; i.e. the genitive plural has the same vowel. Also, there is discrepancy in the Russian literature as to whether the genitive
plural shows initial or final stem stress. I give the Ukrainian and Russian nominative and genitive plural pairs below for comparison, showing both forms for the Russian genitive:

(204)  M2: nominative and genitive in Russian and Ukrainian for /skovorod/ ‘frying pan’

<table>
<thead>
<tr>
<th></th>
<th>Ukrainian</th>
<th>Russian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nom.Pl.</td>
<td>skóvorody</td>
<td>skóvorodi</td>
</tr>
<tr>
<td>Gen. Pl.</td>
<td>skvoróid</td>
<td>skvoród~ skvoród</td>
</tr>
</tbody>
</table>

Recall that for Ukrainian, the initial stress in nominative plural forms like [skóvorody] is a result of OO FAITH required by OO-IDENTHd. The difference in vowel quality between the genitive and nominative plural shifts stress to initial position in the nominative. In Ukrainian, the vowel in the plural derivative must be identical to the base vowel in order to bear stress at the OO-level; the final stem vowel [o] of the nominative plural [skóvorod-y] is different from genitive plural final stem vowel, stressed [í]. The next-best stem vowel is the leftmost vowel which is identical to its corresponding base vowel; the best candidate is thus left-stressed [skóvorody].

But the same reasoning cannot be applied to the Russian case. Since there is no vowel shift, there is no obvious reason why the stress is initial in the Russian nominative plural. In addition, there is disagreement in the literature about the place of the genitive plural stress; most linguists cite final stress (Halle 1973, Redkin 1971) but some dictionaries cite the initially stressed form (Ageenko and Zarva 1967), and some cite both forms (Ageenko and Zarva 2000, Borunova 1983). First, I consider the form which shows

---

51 These two dictionaries recommend the final-stressed form, and the initial one as “not recommended” but not “incorrect”, a term they use for some nouns. I consider both variants and analyze each as a separate
initial stress in all SPL forms, including the genitive plural. I return to the other possibility of final stress in the genitive plural after the analysis below.

With genitive plural also showing initial stress, the paradigm for /skovorod/ in Russian is shown in (205), with bold case for stem-stressed forms:

(205) Russian: /skovorod/ ‘frying pan’

<table>
<thead>
<tr>
<th>Case</th>
<th>SG</th>
<th>PL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nom</td>
<td>skovorod-á</td>
<td>skóvorod-i</td>
</tr>
<tr>
<td>Gen</td>
<td>skovorod-i</td>
<td>skóvorod</td>
</tr>
<tr>
<td>Dat</td>
<td>skovorod-é</td>
<td>skovorod-ám</td>
</tr>
<tr>
<td>Acc</td>
<td>skovorod-ú</td>
<td>skovorod-ámi</td>
</tr>
<tr>
<td>Instr</td>
<td>skovorod-ój</td>
<td>skovorod-ámi</td>
</tr>
<tr>
<td>Loc</td>
<td>skovorod-é</td>
<td>skovorod-áx</td>
</tr>
</tbody>
</table>

By the types of cases which show stem stress we see that this is an M2(a) type of Russian stem, which shows the cases in bold above as members of SPL:

(206) M2(a): SPL = {nom.pl, gen.pl, acc.pl.}

These are the forms which will stand in correspondence to each other in the analysis below.

I propose that in Russian, certain classes of stems are co-indexed with a special constraint COINCIDE-LEFT₁ which is ranked higher than the general constraint COINCIDE-LEFT. Specifically, special COINCIDE-LEFT₁ >> COINCIDE RIGHT (a general constraint) predicts initial ‘i’ stress for this class of stems:
(207) Initial stress

- Proposal: COINCIDE-LEFT accounts for Russian Initial stress:

\[
\text{COINCIDE-L}_{\text{CLASS } i \text{ (INITIAL)}} \gg \text{COINCIDE-R} \gg \text{COINCIDE-L (ELSEWHERE)}
\]

Recall that for Ukrainian, there was no such special COINCIDE-LEFT constraint. We will see consequences of this difference in the next chapter. Also recall that all COINCIDE constraints were ranked below DEP-STRESSSTEM constraints for the Ukrainian analysis.

For Russian also, the special COINCIDE-L constraint is ranked below DEP-STRESSSTEM, together with the other COINCIDE constraints:

(208) Constraint ranking

\[
\text{DEP-STRESSSTEM} \gg \text{COINCIDE-L}_{i} \gg \text{COINCIDE-R} \gg \text{COINCIDE-L (ELSEWHERE)}
\]

The ranking of Dep-StressStem must be ranked above all Coincide constraints; licensing of stress at a stem edge becomes important only when there is a member of the paradigm without an inflectional ending. That form then also affects forms which are related to it by base-derivative correspondence. But forms which are not derivatives of the base will still stress the inflectional ending, even when the stem is a member of the class marked for initial stress.

For example, the noun /skovorod/ is a class ‘i’ initial stem. But [skovorod-á] nom. sg. shows inflectional stress because Dep-StressStem is ranked above Coincide constraints:
(209) Nom. Sg: inflectional stress

<table>
<thead>
<tr>
<th>/skovorod/+a</th>
<th>DEP-STEM</th>
<th>COINCIDE-L</th>
<th>COINCIDE-R</th>
<th>COINCIDE-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) skovorod-á</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b) skovoród-a</td>
<td>!*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(c) skóvorod-a</td>
<td>!*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Candidate (a) is optimal because it satisfies DEP-STEM by stressing the inflection and not the stem. The other candidates are stem-stressed, violating DEP-STEM. Thus the new coincide constraint makes no difference in this case, because the higher ranked constraint DEP-STEM distinguishes the candidates.

The Coincide-Left constraint only exerts its influence in base-dependent forms; i.e. for members of SPL, which as we saw in (206), are the nominative plural, accusative plural, and genitive plural cases for M2(a) type stems like /skovorod/:

(206) SPL = {skovorod-i (nom.pl); skovorod-i (acc.pl); skovorod (gen.pl.)}

There is one member of this set with no inflectional ending, isolated by the set difference below:

(210) SPL-OPL = {skovorod (gen.pl.)}

Recall that I assume for all mobile stems that they are specified as base-dependent stems, so that the conditions on correspondence are satisfied for this Russian form: the genitive plural of /skovorod/ is a base.
Let us consider how this base form receives initial stress in Russian. COINCIDE-L predicts initial stem stress for this ‘i’ stem only where there is no affix. Since there is no inflectional position which can bear stress, DEP-STRESS\textsubscript{STEM} is necessarily violated and the stem-initial position is chosen for stress by our special COINCIDE-\textsubscript{LEFT\textsubscript{i}} constraint:

(211) COINCIDE-\textsubscript{Li} crucial: /skovorod/ → [skóvorod]

<table>
<thead>
<tr>
<th>/skovorod/</th>
<th>DEP-STRESS\textsubscript{STEM}</th>
<th>COINCIDE-\textsubscript{L\textsubscript{i}}</th>
<th>COINCIDE-R</th>
<th>COINCIDE-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) skovoród</td>
<td>*</td>
<td>*!</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b) skóvorod</td>
<td>*</td>
<td>*!</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(c) skovórod</td>
<td>*</td>
<td>*!</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

All three candidates necessarily violate DEP-STRESS\textsubscript{STEM} because there is no inflectional ending to bear stress. COINCIDE-\textsubscript{L\textsubscript{i}} crucially decides among candidates because /skovorod/ is a special ‘i’ stem co-indexed with the special constraint. Therefore, (b) is optimal because it satisfies Coincide-\textsubscript{Left\textsubscript{i}}, realizing stress in initial position. The other candidates violate COINCIDE-\textsubscript{L\textsubscript{i}} and are eliminated.

The tableau in (211) shows how the base form receives initial stress, by virtue of the stem being a member of the special class of ‘i’ stems. Recall that this constraint did not affect the inflected forms in the set of singular forms, since DEP-STRESS\textsubscript{STEM} >> COINCIDE-\textsubscript{L\textsubscript{i}} and DEP-STRESS\textsubscript{STEM} made the crucial distinctions between candidates. Therefore the nominative singular form in (209) [skovorod-á] shows inflectional stress. The difference for the base form in (211) is that DEP-STRESS\textsubscript{STEM} is necessarily violated and so does not distinguish candidates, leaving the crucial violations to the COINCIDE-\textsubscript{L\textsubscript{i}} constraint.
The nominative plural [skóvorod-i] also has an inflectional ending, like the nominative singular form in (209). But the nominative plural does not show inflectional stress, because it is a member of the set SPL. As such, it has status as a derivative standing in correspondence to the base form [skóvorod]. Thus the nominative plural shows leftmost stress by virtue of entering a base-derivative relationship with the base as below:

(212)  Nominative Plural derivative $\rightarrow$ [skóvorod-i]

<table>
<thead>
<tr>
<th>BASE</th>
<th>/skovorod$_i$+i/</th>
<th>OO-DEP$^H_D$</th>
<th>DEP-STRESS$^S_TEM$</th>
<th>COINC-L$_{i}$</th>
<th>COINC-R</th>
<th>COINC-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)skóvorod</td>
<td>skovoród-i</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b)skóvorod</td>
<td>skovorod-i</td>
<td>!</td>
<td>!</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(c)skóvorod</td>
<td>skóvorod-i</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(d)skóvorod</td>
<td>skovórod-i</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>!</td>
</tr>
</tbody>
</table>

Recall that the OO-Dep$^H_D$ prevents stress insertion into new positions; i.e. positions not in the base [skovorod]. Because this stem is also a base-dependent stem, OO-Faith drives a base-derivative relationship between the genitive base and derivative nominative plural so that the nominative plural is also realized with stem stress. Consider candidate (b); this would be the optimal candidate if OO faithfulness were not active, as in the nominative singular case, since it shows inflectional stress and satisfies DEP-STRESS$^S_TEM$. But (b) crucially violates OO-DEP$^H_D$, realizing stress on a segment not present in the base, the inflectional ending [-i]. The other three candidates realize stress on segments which are base segments as well. Since /skovorod$\_i$/ is an ‘i’ stem co-indexed with the special COINCIDE-LEFT$_i$, this constraint makes the crucial distinction; (c) is the optimal candidate, since it alone of the remaining candidates realizes stress in initial position.
As for Ukrainian, what is important in the Russian M2 case above is that stress not be assigned to the inflectional ending in the nominative plural, because the base shows stem stress. The analysis for Russian necessitates a special left-most class which realizes stress in stem initial position. But the other generalizations we made for Ukrainian still hold.

Where there is a member of the plural paradigm showing no overt inflection, the rest of the members of the $S_{PL}$ set show stem stress as a result of OO-Faith to the uninflected base. The difference in Russian is that these effects can also result in leftmost stem stress. That is, for certain specially marked stems, the members of $S_{PL}$ show initial stem stress.

Let us now consider the more complicated case of rightmost stress in the genitive base and leftmost stress in the nominative derivative. As we noted, it is also common for the genitive plural to not show initial stress, as assumed above, but to have the rightmost stem stress: [skovoród]. The whole paradigm would then differ only in the placement of stress in the genitive plural in stem final position, rather than initial position as in the nominative plural:

(213)  /skovorod/ : stem-final genitive plural variant [skovoród]
I claim that in this particular case, stress on the rightmost edge of the stem in the genitive plural form is not a direct result of the licensing constraint Coincide-Right. The form [skovoród] satisfies Coincide-Right, but rightmost stress in such a form is an idiosyncrasy of a few Russian stems. As such, I assume that for this stem, the genitive plural form is stipulated for rightmost stress (or as not indexed with the special Coincide-Left constraint).

The stems showing this rightmost stress possibility are the same M2 stems which in Ukrainian were realized with vowel changes in the genitive plural forms. Recall the historical reason for this sound change in Ukrainian M2 stems, the historical suffixal jer vowel (c.f. Appendix I). Since the Ukrainian and Russian share the same historical Common Slavic ancestor, the same class of stems was also affected in Russian. In Russian, however, the stems do not show a change in vowel quality which allows us the kind of explanation we proposed for Ukrainian. Instead, only stress is affected and realized rightmost.

In most historical accounts of Russian, it is accepted that suffixal jers can realize their stress on the preceding syllable; that is, the stress in [skovoród] is the stress of the jer suffix. Kenstowicz 1998 writes: “It is natural to conclude that these case forms are marked by a jer suffix….When a jer bears stress but fails to vocalize then stress regularly appears on the immediately preceding syllable (3).”
But the synchronic reason for the jer vowel stress surfacing is less obvious since the historical vowel never surfaces, and there are no other effects of the vowel in this form. Predicting jers effects and surface realization thus has been a problem for synchronic accounts of Slavic languages. Readers are referred to Zoll 1996 and Yearley 1995 for OT-based proposals to explain why jers surface only in restricted cases. Zoll proposes that jer vowels in Polish lack a root node in the input, while Yearley assumes (after Rubach 1986) that jer vowels are vowels lacking a mora.

Since there is no evidence for the jers vowels surfacing besides the stress realization, I see no benefit to positing a special jers in the input for these few forms. This would mean that the stress of the jers would be derived by stipulated constraints to ensure that stress of these vowels is faithfully realized. More seriously, a stressed jer vowel in the input would be the only inflectional ending with inherent stress; as we saw in Chapter 2, the system I propose here does not require inflectional endings to have stress in the input. Thus adding a stressed jers to the system would add an unnecessary complication to the system proposed here.

Instead, I assume that the stems which show rightmost stress in the genitive plural (for those speakers who stress the final position) will have stipulated stress in the genitive plural form. It is important for our analysis only that such lexical specification of stress in the genitive plural does not affect the realization of the other SPL forms with initial stress. In fact, the genitive plural still exerts its influence as a base and requires stem stress in these forms. The analysis closely follows the one proposed for the initially
marked base above. The base is determined by its lack of overt inflection. Its stress is realized by faithfulness to input stress, \textsc{Max-StressStem}. The base is then is related to the other \textsc{S}_{\text{PL}} forms by the same \textsc{OO} faithfulness constraint as for other Mobile stems:

\begin{equation}
\text{(214)} \quad \text{Nom.pl. derivative for } /\text{skovorod}+i/. \text{ Base with final stem stress: } [\text{skovoród}].
\end{equation}

<table>
<thead>
<tr>
<th>BASE</th>
<th>/skovorod+i/</th>
<th>\textsc{OO-Dep}_{\text{HD}}</th>
<th>\textsc{Dep-Stress}_{\text{STEM}}</th>
<th>\textsc{Coinc-} \textsc{L}_i</th>
<th>\textsc{Coinc-} \textsc{R}</th>
<th>\textsc{Coinc-} \textsc{L}</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)skovoród</td>
<td>skovoród-i</td>
<td>*</td>
<td>!</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b)skovoród</td>
<td>skovorod-í</td>
<td>*</td>
<td>!</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(c)skovoród</td>
<td>skóvorod-i</td>
<td>*</td>
<td>!</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(d)skovoród</td>
<td>skovórod-i</td>
<td>*</td>
<td>!</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

The same constraint ranking in (212) predicts stress correctly above in (214), even though the base has final, rather than initial stress. Crucially, \textsc{OO-Dep}_{\text{HD}} only eliminates candidate (b) because (b) stresses the inflectional ending, and not a segment that is present in the base. All other candidates satisfy \textsc{OO-Dep}_{\text{HD}}, including the optimal candidate which realizes stress in different positions in the base and derivative. Since the stem is marked as an initially-stressed stem, the nominative plural satisfies \textsc{Coincide-Left}, and candidate (c) is optimal.

Thus, with the genitive plural base either showing stem initial or stem final stress, our analysis captures the facts of M2 stress by the ranking of a special constraint \textsc{Coincide-Left}, which we add to the ranking as below:
This constraint ranking also predicts the other group of M2 stems in Russian, M2(b) which adds the accusative singular form to the set of forms affected by OO faithfulness. That is, the only difference between M2(a) and M2(b) patterns is membership in the set $S_{PL}$:

\begin{align*}
(215) \quad & \text{M2 ranking for Russian} \\
& \text{OO-DEPHD} \\
& \text{DEP-STRESS}_{\text{STEM}} \\
& \text{COINCIDE-L}_{i} \\
& \text{COINCIDE-R (STRESS, STEM)} \\
& \text{COINCIDE-L (STRESS, STEM)}
\end{align*}

\begin{align*}
(216) \quad & \text{M2(a)} : \quad S_{PL} = \{\text{nom.pl, gen.pl., acc.pl.}\} \\
& \text{M2(b)} : \quad S_{PL} = \{\text{nom.pl, gen.pl., acc.pl, acc.sg.}\}
\end{align*}

Let us now turn to the last Russian Mobile stress pattern M3.

5.3.2.3 Mobile Pattern M3

The main difference between Russian M3 and Ukrainian M3 stems is that in Russian, these stems are not predominantly monosyllabic as they were in Ukrainian. We predicted the stem stress in Ukrainian monosyllabic stems by the phonological condition on OO-Faith which included monosyllabic stems. In Russian, however, the M3 stems are not monosyllabic and, as we see below, are stressed in initial position in the singular:
The Russian stems in this class are like Ukrainian stems, however, in that they show a form with no inflectional ending in the singular (nominative and accusative). Let us therefore claim that M3 stems are included in the Russian class of base dependent stems. That is, a base and derivatives can relate by OO-Faith. The base is determined by our set difference below; note that there are actually two forms which are chosen by virtue of lacking overt inflection:

(218)  M3 Base

\[ S_{SG} - O_{SG} = \{\text{béreg (nom.sg.), béreg (acc.sg.)}\} \]

Although there are two forms that can act as a base, they are identical, so we can choose either one to illustrate the base-derivative correspondence below; the effect will be the same. (cf. Chapter 3, section 3.4.3 for evidence.)

The set of singular forms \( S_{SG} \) is:

(219)  \( S_{SG} = \{\text{béreg (nom.sg.), béreg-a (gen.sg.), béreg (acc.sg.), béreg-u (gen.sg.), béreg-e (loc.sg.), béreg-om (inst.sg.)}\} \)
Initial stress is realized in the base and the rest of the paradigm because this class of stems is also included in the ‘i’ initial class. Thus for these stems, i-indexing for initial class holds so that the stems are affected by the high-ranking Coincide-Left\textsubscript{i} constraint:

\[(220) \text{ M3 stems are } i\text{-indexed :} \]
\[\text{Coincide-L} \text{ } i \gg \text{Coincide-R} \gg \text{Coincide-L (elsewhere)}\]

As for M2 stems, the initial stress due to Coincide-Left\textsubscript{i} only surfaces in the base-dependent sub-paradigm. In the M2 case, the base without overt affixation is in the plural paradigm, and so exerts influence on other members in S\textsubscript{PL}. In this M3 pattern, the base is the singular paradigm, and derivatives are members of S\textsubscript{SG}. In both M2 and M3, the initial stress arises only in the relevant S\textsubscript{Y} sub-paradigm.

Consider the output for the singular base for /bereg/, which is indexed as an i-stem (i.e. initially stressed) in the tableau below:

\[(221) \text{/bereg/} \rightarrow [b\text{éreg}] \text{ ‘shore, nom.sg.’} \]

<table>
<thead>
<tr>
<th>/bereg/</th>
<th>DEP-STRESSSTEM</th>
<th>COINCIDE-L\textsubscript{i}</th>
<th>COINCIDE-R</th>
<th>COINCIDE-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) berég</td>
<td>*</td>
<td>*</td>
<td>!</td>
<td>*</td>
</tr>
<tr>
<td>(b) béreg</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The base form is the optimal candidate (b) that satisfies special COINCIDE-LEFT\textsubscript{i}.

The base [béreg] then is related by OO correspondence to other forms in the S\textsubscript{SG} set.

Consider the locative singular derivative /bereg+e/:
The first candidate, with stress on inflection, is eliminated by the OO-Faith constraint \text{OO-DEPHD}. The two remaining candidates both violate \text{Stress-DepSTEM}. Because the stem is a member of the special class of initially stressed i-stems, it can incur violations of the co-indexed constraint, \text{COINCIDE-LEFT}_i. Thus of the two remaining candidates (b-c), (c) is optimal because it shows initial stress, satisfying \text{COINCIDE-LEFT}_i.

Finally, note that the M3 group also includes stems like the M3(b), where the nominative plural also shows stem stress, like the nominative singular. (cf. the stem /topol'/'poplar' below in (224).) To ensure the stem stress on the nominative plural for M2(b) stems, we include it as a member of the \text{SG} set as for all M2(b) stems:

\begin{align*}
(223) \quad \text{M2(b) sub-paradigm set } \text{SG} \\
\text{SG} &= \{\text{nom.sg., gen.sg., acc.sg., gen.sg., loc.sg., inst.sg., nom.pl.} \}
\end{align*}

The nominative plural form is then also derived by correspondence to the nominative singular base and so also shows initial stress.
For example, the nominative plural for /topol/ ‘poplar’ also shows base-determined stress;\(^{52}\) the derivative form corresponds to the base nominative singular [topol’] :

(224) M3(b) nom. pl. derivative

<table>
<thead>
<tr>
<th>BASE: [tópol’]</th>
<th>/tópol’[^i]</th>
<th>OO-DEP(_{HD})</th>
<th>DEP-</th>
<th>COINC-</th>
<th>COINC-</th>
<th>COINC-</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) tópol’</td>
<td>topol’-i</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b) tópol’</td>
<td>topól’-i</td>
<td>*</td>
<td></td>
<td>*!</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(c) tópol’</td>
<td>topol’-i</td>
<td>*</td>
<td></td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

The base form relates by correspondence to the derivative, and so candidate (a) is eliminated because it does not satisfy the OO-DEP\(_{HD}\) constraint which relates the two forms. Since the M3 group is i-indexed, the optimal candidate is (c), which realizes stress on the leftmost edge of the stem, satisfying Coincide-Left\(_i\).

5.3.3 Summary

Thus far, we have seen all the patterns of Russian Mobile stress are predicted if we make the condition OO correspondence a morphological one, so that only for the base-dependent class of stems is the base-derivative relation zRx active in Russian. This differs from the analysis for Ukrainian where the stems where zRx were determined by a phonological conditions: an overt lack of inflection and a phonological condition on singular stems that they also be monosyllabic. But an important generalization holds for

\(^{52}\) The nominative plural form for /topol/ ‘poplar’ also has a variant with a different inflectional ending, and stress on the stem as for M3a: [topol-á]. Most of the stems showing the nominative plural [-a] ending retain stress on inflectional ending for the nominative plural (cf. Coats 1976 p.24). The Ukrainian cognate for this stem is a Fixed stem with stress in the nominative singular stem (with an inflectional ending, unlike Russian): [topól-a] and nominative plural stem [topól-i].
Russian as it did for Ukrainian: Mobile stems always have a base member of the paradigm which lacks overt inflection.

In addition, Russian stems were divided into two positional classes: a special initially stem stressed class, and a class with default rightmost stem stress (as predicted by our analysis for Ukrainian). The ‘i’ initial class was co-indexed with the Coincide-Lefti constraint; this special constraint is ranked above Coincide-Right only in Russian, not Ukrainian.

But in both languages, the generalizations about Mobile stress are the same, and the process of a base and derivative relating by correspondence does not change. The Mobile stressing stems all show a base form which influences other forms in the same sub-paradigm. The base and derivatives are determined by sets of related members which can vary from stem to stem, allowing different cases to be members of the SY sets. The main differences for Russian are summarized below:

- **Two Main Proposals for Russian** :

  I. OO-Faithfulness affects only a certain class of stems, indexed as such: ‘B-stems’

  II. Coincide-Lefti is distinguished between special and general so that special is indexed for an initially stressed class of stems ‘i’ (‘initial’):

  \[
  \text{COINCIDE-L}_i \gg \text{COINCIDE-R} \gg \text{COINCIDE-L} \quad (\text{ELSEWHERE})
  \]
5.4 Other Russian analyses

In this section, I summarize the differences between main points of my proposal with respect to the proposals in Alderete 1999, Brown et. al. 1996, Halle 1997, and Revithiadou 1999, and Kenstowicz 1998. The most important difference between all of these accounts and my proposal is that I derive mobility effects through base-derivative correspondence. This captures the generalization missed by other accounts, which is that there is always a form without overt inflection in the paradigm of Mobile stems. Another major difference is in the analysis of the Post-stem stressing pattern, details of which I give below where relevant; the proposal here, with the ranking \textsc{Dep-Stress Stem >> Coincide-Right} is the only proposal which correctly predicts that in Post-stem stressing paradigms, stress is rightmost where there is no inflectional ending.

5.4.1 Input specification for stress

The major difference between this analysis and Halle 1997 is in the kinds of input specification for stress allowed by each system. I propose a two-way distinction for input stress: a presence of stress, and an absence of stress. Halle 1997 assumes a theory of metrical structure as proposed in Idsardi 1992 (based on Halle & Vernaud 1987), where Idsardi allows for a greater variety of underlying specifications of stems and suffixes. Specifically, stems are specified as one of the following three types:
(225) Underlying specification of Russian stems (Halle 1997): 53
1. unaccented in the UR
2. accented in the UR as either
   a. accented (projecting a line 0 asterisk preceded by a left parenthesis)
   or
   b. postaccenting (with a left parenthesis after the last asterisk)

Suffixes also can be either inherently stressed or unstressed, as Halle 1997 writes: “The singular case endings of i-stems and o/e-stems are unaccented, whereas those of the a-stems are accented except for the accusative singular –u. The plural case endings are accented except for the nominative plural –y/-i, which are unaccented.” Thus there is some notion of a correlation of the shape of the noun to type of accent in Halle, but this is related to the type of ending, rather than the type of declension. There is therefore much more lexical specification for stems and affixes in this account than mine, where stems are either accented or not underlyingly, and indexed for OO relations and Initial stress.

Halle 1997 also incorporates several rules specific to his theoretical framework; one of the rules is a stress retraction rule to account for cases like M1, where stress is on the inflectional ending in the singular, and retracted to the stem-final syllable in the plural. The stems which undergo this rule must be lexically marked as stress-retracting stems. Thus in some way, Halle’s account is similar to mine by requiring lexical marking of a particular group of stems which undergo the M1 shift. My account differs by using the same index for all mobile stems; whether the singular or plural of the specially marked

53 The stems are also specified for the kinds of stress marks and parentheses they induce:
1. unaccented in the UR: with no parenthesis
2. accented in the UR as either
   a. accented : projecting a line 0 asterisk preceded by a left parenthesis
   or
   b. postaccenting : with a left parenthesis after the last asterisk
stem is affected is determined by which paradigm has a member without overt inflection. This generalization is captured in my proposal, but not in Halle’s account.

Finally, there is a difference in which accentual class is predicted as the default in Halle’s account and mine. Halle needs two retraction rules to ensure that post-accenting stems without inflection arise with final, and not initial stress, whereas our constraint ranking allows for final post-stem stress to fall out by default. By contrast, initial stress is the default by rules in Halle’s account, whereas some mobile nouns are indexed as initial in my account. The default is different; but both proposals have specially marked nouns in the lexicon to account for the non-default edge. I assume the rightmost edge as default because this predicts the more frequent class (the post-stem stressing class, and not the mobile class with initial stress) to fall out of the default ranking.

5.4.2 Faithfulness

Alderete 1999 also allows the rightmost edge as the default edge in Russian nouns, and so my account is closer to Alderete in this respect than to Halle 1997. But Alderete is concerned mainly with derivational stress patterns and the potential difficulties of incorporating these into an OT system, especially if we assume an OT system with a universal ranking for ROOT FAITH >> AFFIX FAITH (as proposed by Prince and McCarthy 1995). The main interest of this thesis, inflectional stress in Ukrainian, is not a central concern for Alderete 1999. Yet much of the groundwork proposed by Alderete for Slavic stress in general has been adopted here for inflectional stress, as we have noted throughout the text.
But this analysis differs crucially for Post-stem stressing and Mobile classes. My proposal that Post-stem stressing nouns are a result of DEP-STRESSSTEM and COINCIDE RIGHT is different by its focus on the relativization of DEP to stem position, a proposal not made in Alderete 1999. Thus, faithfulness to a lack of stem stress as a central part of the explanation of P stems is new here, and not a claim made by Alderete 1999, who derives P stems by the constraint ranking of a special post-stem stressing constraint.

The most significant difference between this proposal and Alderete 1999 is in the analysis of Mobile stems. As mentioned earlier, Alderete’s system does not allow for the M2 class, where stress is on the inflection in the singular, and stem-initially stressed in the plural. Alderete is alone in supposing that the class is ‘empirically inadequate’ whereas this proposal accounts for the M2 pattern with the same constraints necessary for other Mobile patterns. Also, Alderete’s system does not capture the important generalizations about Mobile stems that our system does.

All the Mobile patterns in Alderete 1999 are analysed within the system of Anti-Faithfulness (AF). The AF system is centered around the phenomenon of dominant stress for derivational suffixes, and it may be the case that an AF system accounts for Russian derivation. (Readers are referred Alderete 1999 for details of the specific analysis.) But the AF argument for inflection is not as strong as for the derivational stress phenomena which are the foundation for Alderete 1999.

The main problem is that an AF account for inflectional stress draws on the contrast between stem stress in the singular plural, and inflectional stress in the plural, and vice
versa. But the same contrast does not exist all the time for inflection in the same way it does in derivation. In the AF system, there are certain affixes which are dominant, and require that the stem stress be changed. If a dominant affix attaches to a stem with stress, anti-faithfulness constraint \( \neg \text{OO-MAX} \) that requires input stem stress be deleted in the derivative:

\[
(4) \quad \neg \text{MAX-X} \quad \text{(Alderete 1999)}
\]

‘If there is one, delete (at least) one X in the \( S_1 \rightarrow S_2 \) mapping

For example, when stress is shifts from stem stress in the singular to inflection in the plural, (what we call M3), Alderete considers this an AF effect, with the plural suffix inducing dominance, and so triggering satisfaction of the constraint \( \neg \text{OO-MAX-PROMINENCE} \). I show the interaction of Alderete’s constraints below (the tableau is based on, but not given in Alderete’s account):

(226) AF analysis of Mobile stress á la Alderete 1999

<table>
<thead>
<tr>
<th>Base</th>
<th>Derivative</th>
<th>( \neg \text{OO}_{\text{Dom-MAX-PM}} )</th>
<th>\text{OO-MAX-PM}</th>
<th>PSP</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. kólokol</td>
<td>[kólokol]-a</td>
<td>*</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b. kólokol</td>
<td>[kolokól]-a</td>
<td>*</td>
<td>*</td>
<td>*!</td>
</tr>
<tr>
<td>c. kólokol</td>
<td>[kolokol]-á</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

The AF constraint \( \neg \text{OO-MAX-PM} \) crucially eliminates (a), which is faithful to the singular stress, because \( \neg \text{OO-MAX-PM} \) requires deletion of stress. The other candidates delete and insert a new stress, satisfying the AF constraint. Of these, the best is one which satisfies Alderete’s “PSP”: “Post-stem-prominence” constraint, which requires prominence to arise at the post-stem position (i.e. the constraint which is in effect equivalent to our DEP and Coincide-R combination of constraints, which predict Post-stem stressing nouns).
The analysis works for a case like that in (226), but it requires that the plural suffix is the reason for the dominance effect. The problem is that not all nominative plural suffixes with the same ending [-1] induce dominance effects. There are [-1] suffixes, identical in shape to the suffix above, which affix themselves to fixed stress stems with no effect. Also, there are other suffixes for the nominative plural, like the /-a/ suffix, which do induce the same dominance effect as some [-1] suffixes. Alderete claims that the dominant plural suffix in (226) is noted in the lexicon as an allomorph of the other non-dominant plural suffix. Therefore, there are two plural suffixes in the input, one not dominant suffix, and another ‘dominant’ suffix.

Thus there are two main problems with extending the AF system to inflection in Russian (and Ukrainian): the specifications for dominance require stipulation, since dominance effects do not extent to all forms of an inflectional affix, and there is no other surface reason to believe these suffixes are so specified in the input. There are also no other dominant derivational suffixes which show dominance effects in Alderete’s derivational system which show this kind of split personality. Therefore, the extension of the AF system to inflection necessitates a lexical system with much more built-in complexity than necessary to account for the derivational system, and the surface generalization about the unaffixed members in paradigms of mobile stems is captured by the AF system.

An alternative approach to the question of how to represent these dominance effects in OT is proposed in Revithiadou 1999 who claims that accentual prominence is dependent on morphological headedness. Prosody is therefore determined by morphology, as
Revithiadou writes: ‘Following Baker (1988) who claims that morphological structure in these languages is built in the syntax, I argue that the (morphosyntactic) head is also accentually prominent (10)’. The dominant derivational affixes are ‘heads’ so their accent wins. The relevant constraints are:

\[(105) \quad \text{Head Faith (LA) (Revithiadou 1999)}
\]
\[\begin{align*}
\text{A lexical accent sponsored by a morphological head in the input has a correspondent in the output (Head Max (LA))} \\
\text{A lexical accent hosted by a morphological head in the output has a correspondent in the input (Head Dep (LA))}
\end{align*}\]

The ranking of Head Faith >> General Faith (including root and other affix faith) accounts for apparent counterexamples to root faithfulness by assuming that some affixes are not plain affixes but heads with special status. Consequently, this grants an exception to the universal ranking of Root Faith >> Affix Faith proposed by McCarthy and Prince 1995, since heads are allowed to supercede root faithfulness, something Alderete 1999 does not allow.

As in our analysis, Revithiadou 1999 includes all four mobile classes of stress, including what I call the M2 class showing plural initial stress, unlike Alderete 1999, another OT analysis. But Revithiadou bases much of her OT account on data and assumptions in Halle 1997, and many of the differences between our account and this one lie in these assumptions. Thus Revithiadou, like Halle, distinguishes between three groups of stems underlyingly: accented, those with no lexical accents, and the ‘unaccentable’ group which surfaces as the post-accented class. Like Halle, ‘the default option in Russian is leftmost stress (146)’ in this case accomplished by the constraint:
Edgemost-Left: A peak of prominence lies at the left edge of the word.

This edgemost left constraint accounts for the M2 class of initially stressed stems in the plural, like ‘skóvorody’. This constraint is ranked below faithfulness and takes effect only when there are no lexical accents in the string. The same constraint is therefore not the reason for why there are many fixed stems with initial in Russian; as Revithiadou acknowledges, this majority of words in Russian which arise with initial stress are a result of inherent accent and not this default marking. The same problem noted for Halle thus exist in Revithiadou’s proposal: the default accounts for the smallest group of mobile stems.

The post-accenting stems in Revithiadou, like in Halle, are not the default. Instead, these stems are classified in Revithiadou as ‘unaccentable roots’; these roots have a floating accent which can be realized ‘anywhere in the word (139). The accent arises on the inflectional suffix by the constraint *Domain, which states that ‘a lexical accent should not be associated to the morphological domain that sponsors it (54)’:

(228) \[
\begin{align*}
*\text{Domain:} & \quad *\text{LA} \\
& \mid \\
& [\ldots\sigma\ldots]_a
\end{align*}
\]

*Domain, Revithiadou writes, “expresses the need of accents to globalize, to extend beyond the restricted domain of a morpheme and become a property of the word.” Thus, the post-accenting paradigm arises because a floating accent does not have to remain fixed and can move beyond its input sponsor, to the inflectional ending. The rightmost
stem stress position for post-accenting stems without inflectional endings necessitates another constraint, similar to our Coincide-R constraint:

(229)   Align-R (LA, PrW, R)
        Align a lexical accent to the right edge of the prosodic word

This constraint affects the underlyingly floating accent, and here it becomes clear why the accent must be present underlyingly in Revithiadou’s account: otherwise, we would expect the default initially stressed position as a result of Edgemost-Left. The two edge constraints are crucially different in that Edgemost-Left does not refer to input accents, while Align-R does restrict its effects by aligning only lexical accents. Align-R is ranked below general faithfulness to heads so that fixed stress is not affected by rightmost alignment, and only the floating accent is rightmost aligned.

In my proposal, the post-accenting pattern is a result not of a floating accent obeying the markedness constraint *Domain and Align-R, but of the faithfulness constraint DEPSTRESSSTEM, which ensures faithfulness to an underlying lack of stress, and the general default to Rightmost edge by Coincide-Right. Thus the fundamental difference between the two proposals is that (as in Halle’s account), Revithiadou needs to distinguish more types of underlying specifications for stems, and a complex system which includes floating accents to allow for the second largest group of stems, P stems. The system proposed here has fewer underlying distinctions for stress, and allows P stems to fall out by default. And, finally, the generalizations noted here for Mobile stems are not part of this account.
5.4.3 Paradigms and Declensions

Halle 1997 writes: “There is no correlation between the declension class of a stem and its accentual paradigm (282).” It is not surprising that Halle claims there is no correlation because he sees the relationship between declensions and accentual patterns in absolute terms: “… nouns of all three accentual classes are found in each of the declensions” (282). Thus, this is another major difference between Halle’s account and the proposal made here.\(^{54}\) Halle assumes that because more than one pattern is possible for each declension (i.e. fixed and post-stem stress exist for 2\(^{nd}\) declension nouns), there is no correlation. Because the account here is couched in OT terms with violable constraints, we can allow P stems to realize a lack of input stress faithfully, and others to violate faithfulness and arise as Mobile stems due to OO-Faith.

Brown et.al. 1996, however, note that there is a correlation between declension class and the type of stress pattern which is shown by that class, which is part of this analysis. Specifically, they write that a particular declension class is more likely to show a particular type of mobile stress pattern than another declension class. The numbers (based on Table 2 in Brown et. al.) for Russian stems are summarized below\(^{55}\):

\[
\begin{array}{|c|c|c|c|c|}
\hline
\text{Decl / Zero in:} & P & M1 & M2 & M3 \\
\hline
1^{st} & Sg & 2104 & 15 & 5 & \textbf{444} \\
\hline
2^{nd} & Pl & 420 & \textbf{244} & 60 & 3 \\
\hline
3^{rd} & Sg & 5 & 0 & 0 & 113 \\
\hline
4^{th} & Pl & 148 & 83 & 4 & 45 \\
\hline
\end{array}
\]

\(^{54}\) Halle also admits only three declensions, while Brown et.al. 1996 consider four, in line with traditional accounts of Russian.

\(^{55}\) I omit the difference between (a) and (b) types of Mobile patterns, where the accusative is also part of the alternation, and add both numbers together (they are shown separately in Brown et.al.)
Most importantly for our account, 2nd declension a-stems, with an uninflected form in the plural, account for the vast majority of the M1 (71%) and M2 (87%) nouns. The 4th declension stems account for most of the rest of M1 and M2 patterns, and this neuter declension also shows a zero affix in the genitive plural in Russian. Unlike Ukrainian, 2nd and 4th declension also show a prevalent P stress in Russian, so the Mobile stems have to be specified in the lexicon.

92% of the M3 pattern is accounted for by 1st declension (444) and 4th declension (113) stems; in these there is a form with no overt ending in the singular. Interestingly, almost all the 3rd declension stems are M3 class; therefore, the vast majority of these are indexed in my system for initial stress, whereas only a few are not (the 5 showing P stress). The 1st declension shows a more typical division with fewer (444) indexed as initial stems than P stems (2104).

Brown et. al. show the priority relation between declension class and stress pattern, but do not explore the surface characteristics of the actual paradigms in more detail as we do here. They, like other accounts of Russian, do not extend the correlation between stress and declension types to a correlation between stress and the specific members of a paradigm—especially the overtly uninflected base forms noted in this account.

Specifically, I show that the declensions which show Mobile stress always show a base without overt inflection in a Mobile sub-paradigm; that same sub-paradigm is where we see stem stress. The other sub-paradigm is not affected by the base, and instead shows faithfulness to the lack of input stress as expected.
5.5 JERS EFFECT

A stress-related phenomenon which has received attention in the Russian literature, especially in Kenstowicz 1998, is ‘double retraction’. Doubly retracted forms in Russian are those that show a fully vocalized jer in the final stem position of certain nouns, but only in the genitive plural. For example, the stem /tjurm/ necessitates final vowel insertion in the genitive plural, because this form has no overt affix, and because *rm is not an allowed coda in Russian. The paradigm below shows all other forms with inflectional endings can syllabify the [m] with the following inflectional vowel, but that the genitive plural arises with the inserted jer:

(231) Jers effect: /tjurma/ ‘prison’

<table>
<thead>
<tr>
<th></th>
<th>Sg</th>
<th>Pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominative</td>
<td>tjurm-á</td>
<td>tjúrm-i</td>
</tr>
<tr>
<td>Genitive</td>
<td>tjurm-i</td>
<td></td>
</tr>
<tr>
<td>Dative</td>
<td>tjurm-é</td>
<td>tjúrm-am</td>
</tr>
<tr>
<td>Accusative</td>
<td>tjurm-ú</td>
<td>tjúrm-i</td>
</tr>
<tr>
<td>Instrumental</td>
<td>tjurm-ój</td>
<td>tjúrm-ami</td>
</tr>
<tr>
<td>Locative</td>
<td>tjurm-é</td>
<td>tjúrm-ax</td>
</tr>
</tbody>
</table>

There are only 30 such stems cited by Kenstowicz in Russian, but our system does predict these when we consider the role of the jer and its interaction with other constraints. (There are also similar cases in Ukrainian; see database section titled “Jers stems”. The analysis proposed here for Russian is extended to the Ukrainian jers stems as well.) The jers stems are noted for their ‘irregular’ nature by Kenstowicz and others. But note its regularity with respect to the analysis thus far; this is a mobile stem. The only irregularity is that the stem stress in the plural is leftmost, and not rightmost.
Not all jers act as in the form above. In fact, there are jers which do surface with stress as in the stem /selEc/: [seléc] gen. pl. In all such stems, however, the other forms of the plural are Post-stem stressing, so that the nom.pl form, for example, is [selc-á] showing inflectional stress. All stems which do not show stress on the jer in the genitive plural do show stem stress as in the case of /tjurEm/ above, Kenstowicz notes. These are the mobile stems in our analysis.

I propose that the reason for the lack of stress finally in the genitive is a result of these stems being indexed as a special class of stems in Russian; specifically these are the stems coindexed for the OO-faithfulness constraint $OO\text{-DEP}_{\text{HD}}$. We could also propose that this is another class of Coincide-Left stems so that stress is always leftmost in the plural, affecting the base and other forms when paradigmatic uniformity holds. But note the final vowel in the base form given in bold: the [e] is the surface realization of a jer vowel, needed here for syllabification purposes. There is no need to list additional forms in the lexicon as Coincide-Left forms if we consider the lack of stress on the jers vowel in [tjúrem].

The combination of OOFaith and jers in the base form [tjúrem] above drives the leftmost stress in this paradigm. Stress in the actual base form is predicted if we acknowledge the weak status of jers and do not allow it to bear stress. Rubach 1986, Kenstowicz and Rubach 1987, Yearley 1995, assume that jers are underlyingly moraless and hence violate DEP when they are realized, since a mora is inserted. But Zoll 1996 argues that jers show
defective root nodes. Either proposal can be incorporated into our analysis, since in both cases whatever we assume is lacking in the input specification of jers must be inserted in the output, necessitating some type of Dep violation, which we will see is the crucial part of the analysis below.

Let us assume that a jer vowel has a defective root node, and the realization of a true root node violates the DepHd constraint below, where root nodes are the ‘elements’ which the constraint refers to:

\[(232) \text{DEPHd} \]
Every element contained in the prosodic head of S2 has a correspondent in S1
i.e. Every root node contained in a prosodic head in the output has a correspondent in the input

Note this is an I/O version of our OOFaith constraint prohibiting stressed heads to contain new material. The input-output version of DepHd prevents the jer vowel from being stressed (assume /E/ shows [e] with a defective root node):

\[(233) \text{Jers-containing Base} \]

<table>
<thead>
<tr>
<th>/ tjurEm/</th>
<th>DEPHd</th>
<th>COINCIDE-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) tjúrem</td>
<td>*!</td>
<td>*</td>
</tr>
<tr>
<td>(b) tjúrem</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Candidate (a) [tjúrem] violates Coincide-Right, but satisfies the DEPHd constraint by realizing stress on a segment which does not change the root node from input to output. Since this stem is indexed for base-dependence, [tjúrem] is our base form for correspondence.

The rest of plural paradigm follows base stress by OO-DEPHd:

<table>
<thead>
<tr>
<th>Base</th>
<th>Derivative</th>
<th>OO-DEP&lt;sub&gt;HD&lt;/sub&gt;</th>
<th>DEP-STRESS&lt;sub&gt;STEM&lt;/sub&gt;</th>
<th>COINC-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) tjúrem</td>
<td>tjúrm-i</td>
<td>*!</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>(b) tjúrem</td>
<td>tjurm-i</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As expected, OOFaith to the base form ensures that the stem is stressed in the derivative form in (a), at the expense of satisfying DEP-STRESS<sub>STEM</sub>.

The crucial point is that these double retraction cases are examples of special mobile stems, which we have already accounted for by coindexation with OO-Dep<sub>HD</sub>. As long as we allow the same class to be coindexed with the input-output version of Dep<sub>HD</sub>, we prevent the jers being stressed for this particular class of stems. This follows from our account if we allow the same constraint and indexing to exist at both the output/output and the input/output levels. We might very well expect that the same constraint should be active at both levels, and we see that the result is an account of the complex case of Russian double retraction.

5.6 CONCLUSION

To summarize, we have seen that Russian, like Ukrainian, shows Fixed stress and Post-stem stress, and three main types of Mobile stress. Compared to Ukrainian, we see the same general patterns, but the monosyllabicity of M3 stems is not a factor in predicting the type of mobile stress in Russian. Instead, Russian M3 is predicted by the co-indexation of a special Leftmost stress constraint, Coincide-L<sub>i</sub>, with classes of stems M2 and M3. The chart below summarizes the main patterns and constraints:
(235) Summary

<table>
<thead>
<tr>
<th>Russian group</th>
<th>SG. Stress</th>
<th>PL. Stress</th>
<th>OO-Faith</th>
<th>New constraint:</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>inflection</td>
<td>stem-final</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>M2</td>
<td>inflection</td>
<td>initial:</td>
<td>✓</td>
<td>Coincide-L₁</td>
</tr>
<tr>
<td></td>
<td></td>
<td>nom., acc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M3</td>
<td>stem-initial</td>
<td>inflection</td>
<td>✓</td>
<td>Coincide-L₁</td>
</tr>
</tbody>
</table>

The constraint ranking for all Russian patterns of stress follows in the conclusion, where it is compared to the ranking for Ukrainian.
6.1 SUMMARY

The three main patterns of stress in Ukrainian and Russian are captured in this account by these main points:

- **Fixed stress**: Faithfulness to input specification of stress; specifically, a presence of stress in the input.
- **Post-stem stress**: Faithfulness to input specification of stress, specifically, an absence of stem stress in the input.
- **Mobile stress**: Violation of faithfulness to lack of stress by OO-Faith, where a base form without overt inflection affect the rest of the sub-paradigm.

The analysis for Fixed stems is not remarkable, but the fact that all other stems are unspecified for stress is a point of departure for this proposal as compared to most accounts of Russian. The Post-stem stress analysis incorporates a ranking of constraints which predicts the rightmost default position for all uninflected forms in P stem paradigms; this is an original proposal. Finally, the Mobile stem analysis captures the generalization that all Mobile stems have a base which influences other forms in its sub-paradigm.

6.2 RANKINGS

The ranking for all constraints shown for the analysis of Ukrainian is:
(236) Ranking: Ukrainian

\[
\begin{array}{c}
\text{[iC]} \searrow \\
\text{IDENT-V} \\
\text{DEP-STRESS} \quad \text{DEP-STRESS}_{\text{STEM}} \\
\text{COINCIDE-R (Stress, stem)} \\
\text{COINCIDE-L (Stress, stem), NONFINALITY}
\end{array}
\]

\[\text{HEAD} \quad \text{OO-DEP}_{\text{HD}} \quad \text{CULMINATIVITY} \quad \text{MAX-STRESS, MAX-STRESS}_{\text{STEM}, NO-FLOP, OO-IDENT(HIGH, ROUND)}_{\text{HD, DEP}}_{\text{HD}}\]

To more easily compare the Ukrainian and Russian systems, consider the constraint rankings which crucially predict the main non-fixed patterns, M1-M3:

(237) Summary ranking: Ukrainian

\[
\begin{array}{c}
\text{HEAD} \\
\text{OO-DEP}_{\text{HD}} \\
\text{DEP-STRESS}_{\text{STEM}} \\
\text{COINCIDE-R (STRESS, STEM)} \\
\text{COINCIDE-L (STRESS, STEM)}
\end{array}
\]

\[\text{OO-IDENT(HIGH, ROUND)}_{\text{HD, MAX-STRESS}}\]

The ranking for Russian which predicts the same patterns is:
The constraint ranking differences between Russian and Ukrainian are the lack of crucial ranking of OO-IDENT(HIGH, ROUND)_{HD} in Russian, and the inclusion of a special Coincide-Left constraint COINCIDE-L_{i}(STRESS, STEM) in Russian. The COINCIDE-L_{i} (STRESS, STEM) is needed to predict the M2 and M3 patterns in Russian: these patterns are a result of a class in Russian which obeys and is coindexed with the specific COINCIDE-L_{i} (STRESS, STEM) constraint. The M2 pattern in Ukrainian is by contrast a result of the highly-ranked OO-IDENT(HIGH, ROUND)_{HD}; the class of M2 stems is identified by the phenomenon of vowel shifting in Ukrainian (shown in (236) by [iC] \gg \Rightarrow \text{IDENT-V}) but not in Russian. Finally, the other major difference between Russian and Ukrainian is that all the mobile stems in Russian must be identified as “base-dependent” stems in the lexicon so that they are affected by the OO-Faith constraint, where no such specification of class is necessary to predict the more robust phenomenon of Mobile stress in Ukrainian.
6.3 CONCLUSION

This thesis has shown how inflectional nominal stress patterns can be predicted from the characteristics of a noun’s paradigm. The same claims can now be extended in further research to other categories; for example, derivational nouns, verbs and other lexical categories in Ukrainian and Russian might support the argument here by showing the same generalizations in action in other parts of the grammar. Verbs in Ukrainian, for example, show stress contrasts for different types of aspect (rather than number as we saw for nouns). For example, nouns with stress on the stem in the imperfective in (a) resist stress on the stem for the perfective forms in (b) (note the variation; both forms are possible).

(239) (a) dîb-attî \( \rightarrow \) walk slowly/on tip toe-infinitive ‘to walk slowly’

(b) vî-dîb-attî, vî-dîb-âtî \( \rightarrow \) perf-walk slowly-inf ‘to leave with much effort in walking’

(240) (a) jîzd-ittî \( \rightarrow \) drive-inf. ‘to drive’

(b) vî-jîzd-ittî, vî-jîzd-îtî \( \rightarrow \) perf-drive-inf ‘to drive everywhere’

Verbs also show stress contrasts; stress contrasts are not restricted to nouns. The types of patterns of stress contrasts are as many and varied in verbs as in nouns, and are beyond the scope of this dissertation. Yet another area for further research is the comparison of the nominal data presented here for Ukrainian with that for Belorussian, the other East Slavic language most closely related to Russian. This thesis presents a comparison of Ukrainian and Russian; the analysis would be well-served by a comparison of all three languages.
The stress patterns shown in this thesis for Ukrainian and Russian in part depend on whether there is presence of stem stress in the input, or absence of stress in the input. Chapter 2 shows that presence of stress in the input results in nouns which show Fixed stress, whereas absence of stem stress usually results in Post-stem stress. Thus both Fixed and Post-stem types of stress are characterized by Faithfulness to stem stress. Faithfulness to both underlying presence and absence of stress is recognized by the two faithfulness constraints MAX and DEP.

This proposal also assumes a division into stems which are either stressed or stressless. Faithfulness to Fixed stress is neither new nor surprising. The characterization of certain stems as lexically marked for stress, and others as not inherently stressed, is one which has a long history in the generative accounts for Russian. Brown et. al. 1996, Halle 1973, 1997, Halle and Idsardi 1995, Idsardi 1992, Melvold 1986, 1990, Stankiewicz 1986, 1993, all mark Russian morphemes according to whether they are inherently stressed or not.

But this account differs by analyzing Post-stem stress as faithfulness to a lack of stress, whereas accounts of Russian usually specify a special rule or constraint requiring stress to arise on Post-stem syllable. Here, faithfulness to that lack of stem stress alone drives the Post-stem pattern. DEP-STRESSSTEM is specified for prominent stem position to ensure faithfulness to a lack of stress in the stem supercedes faithfulness to a lack of stress in inflectional affixes.
Mobile stress is the final pattern in Ukrainian and Russian nominal inflection. Mobile stress is usually a different type of stress in other analyses of Russian (cf. for example, Idsardi 1992, Halle 1997, Revithiadou 1999). I maintain the two-way distinction for underlying stress (i.e. presence and absence) by looking carefully at the whole paradigm of a Ukrainian nominal stem. I show that a particular member of the paradigm always triggers Mobile stress, and that Mobile stems therefore need not be specially marked in Ukrainian. My proposal is that de facto, mobile stems’ paradigmatic shape, and one member in particular, predict mobile stress in Ukrainian: one member of the paradigm, by virtue of its special state as an uninflected form, serves as the base for the rest of the paradigm. The account for Ukrainian is extended to Russian, where Mobile nouns in the present analysis are also affected by a special base member of the paradigm. This is a new generalization for Russian. The base-dependent class is specified in Russian as a separate class, but the analysis is the same for this Russian class as for the more robust mobile phenomenon in Ukrainian.

The Mobile inflected forms are related in this analysis by OO correspondence: a privileged base affects derivative forms in the same sub-paradigm. The Base-Priority hypothesis is usually reserved for derivational relationships among words; here I extending it to inflectional paradigms. As discussed in Chapter 3, I do not make the further claim that the grammar must make crucial reference to paradigm structure; the argument here rests on the priority of a well-defined base form, rather than the structure of the paradigm as part of knowledge of the grammars of Ukrainian or Russian. The base-derivative relationship proposed here for inflectional paradigms allows us to capture the
generalization that Mobile stress always occurs when there is a base form in the sub-paradigm showing stem stress, a generalization missed by previous accounts of Russian nominal inflection.