6

On absolute and contextual syncretism: Remarks on the structure of case paradigms and on how to derive them

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6.1 Case paradigms: Introduction

A set of morphologically-related words, each containing the same stem and the morphological realizations of different combinations of the same set of inflectional features–which may represent morphosyntactic properties such as case, gender, number, tense, person, etc.,–is traditionally called a paradigm. In this chapter I will deal with the nature and structure of paradigms in terms of the model of morphology called Distributed Morphology (DM) (Halle and Marantz 1993). The paradigms that will be investigated are those of the case systems of Old French, Sanskrit, Classical Greek, and, in particular, of Latin.

In Distributed Morphology, paradigms are epiphenomenal constructs derived by establishing the feature sets entering the terminal nodes of the morphosyntax and by determining the vocabulary items that are inserted in these terminal nodes. No knowledge of the paradigm as a structured set of fully inflected words is required. A fundamental issue to address in accounting for paradigms is that of their structure, i.e., the system of morphological contrasts characterizing them. Research in Distributed Morphology has focused on the identification of the vocabulary items and on the operation of impoverishment as the means to account for this structure (Halle and Marantz 1993; Noyer 1998; Bobalijk 2001). In this chapter I will propose that this is not enough and that to achieve this goal one must also consider the fundamental role played by the constraints that govern the combinations of features in the terminal nodes of the morphosyntax. These constraints generate the overall structure of the paradigm. I will deal with syncretisms, i.e., with situations in

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which the same morphological realization is assigned to two different morphosyntactic categories. As we will see, two different types of syncretism must be distinguished: contextual syncretism and absolute syncretism. In the case of absolute syncretism two morphosyntactic categories which may have different morphological realization in language A have the same morphological realization across the morphology of language B. Thus, for example, the ablative and the instrumental, which are morphologically distinct in Sanskrit, are both morphologically realized by the ablative in Latin. In the case of contextual syncretism, in a certain morphological context, language A has the same morphological realization for two different morphosyntactic categories that are otherwise morphologically distinct in other contexts in A. For example, whereas Latin distinguishes between the dative and the ablative in singular nouns of the first, second, and fifth declension and in singular non-neuter nouns of the third and fourth declension, such distinction is not present in plural nouns of all declensions and in the neuter singular nouns of third and fourth declension. In this chapter, I will propose an account for contextual and absolute syncretism. Contextual syncretism is accounted for by determining the feature specifications of the vocabulary items and by using the operation of impoverishment. In absolute syncretism, instead, we need to use feature-changing procedures that modify the feature combinations of the terminal nodes of the morphosyntax. These procedures–akin to the rules of referrals of Zwicky (1985) and Stump (1993)–involve repairs triggered by markedness constraints.

The paper is structured as follows. Sections 6.2.1 and 6.2.2 introduce the main facts to be analyzed. Section 6.2.1 illustrates the case paradigms of Old French, Sanskrit, and Classical Greek and explains why the notion of case is needed. It also introduces the concepts of contextual and absolute syncretisms. Section 6.2.2 deals with these two types of syncretism in the case paradigm of Latin and shows how these two types of syncretisms behave differently with respect to concord. This section also discusses the status of the Latin locative case, which is syncretic with the genitive or dative in nouns of towns or small islands and with the ablative in all other nouns. It is shown that in this case we are dealing with an instance of absolute syncretism.

Section 6.3 outlines the model proposed here. Section 6.3.1 introduces the morphological features used in the analysis and illustrates under what formal conditions there is a morphological contrast in a system. Section 6.3.2 analyzes the instances of contextual syncretism found in Old French, Sanskrit, Classical Greek, and Latin; it is hypothesized here that contextual syncretism is accounted for by determining the feature specifications of the vocabulary items forming a paradigm and by using the operation of impoverishment. Underspecification of the vocabulary items is crucial in the analysis of

contextual syncretism. In section 6.3.3, I turn to absolute syncretism. The following model is proposed. In the morphological component syntactic grammatical relations and thematic roles are universally mapped into the same set of morphological case features. Vocabulary insertion accesses only a subset of them. This limited feature access is obtained by assuming that there is a set of restrictions that filter out feature combinations that do not have morphological realization in a language and change them into feature combinations that do have this realization in the language. This is absolute syncretism. Section 6.3.3.2 shows that morphosyntactic representations cannot be underspecified to account for this type of syncretism differently than vocabulary items in the case of contextual syncretism. Specifically here I consider the hypothesis that grammar does not generate the feature specifications of cases that are not morphologically realized, i.e., of the cases that undergo absolute syncretism. Such a hypothesis will be rejected. Section 6.3.4 introduces the case restrictions, the markedness constraints that govern the structure of case systems. First, in section 6.3.4.1, the notion of morphological markedness is discussed; it is proposed that the morphological realizations of certain feature specifications, or of certain combinations of feature combinations, as affixes with an idiosyncratic exponent is "marked", i.e. costly. Assuming that a general principle of economy governs language, languages will tend to avoid these marked combinations. I will consider markedness effects in the case of case systems by showing that cases must be ranked into an implicational hierarchy. Section 6.3.4.2 illustrates how markedness effects can be accounted for by ranked negative constraints disallowing configurations of feature specifications. The negative constraints needed to describe case paradigms, the case restrictions, are introduced in this section. Active constraints mark certain feature combinations as illicit. These illicit configurations are removed by repairs. Section 6.3.4.2 illustrates how by using active case restrictions and the related repairs we can account for the cases of absolute syncretism introduced in the first part of the chapter. In particular, an analysis of the syncretic changes affecting the Latin locative case is proposed. Section 6.3.5 shows how diachronic changes in case systems can be accounted for only by changes in the featural specifications of the morphosyntax, as the model proposed here predicts. Section 6.3.6 shows that phonological changes in the case exponents cannot account for diachronic changes in the structure of case systems, as often proposed. Section 6.4 discusses and rejects an alternative model in which there are no constraints and repairs that eliminates illicit feature combinations that do not have morphological realization in a language. In this model all possible syncretic patterns must be encoded in the feature system and the absolute syncretism patterns found in a language

must be accounted for only by looking at the feature specifications of the vocabulary items of the language. Finally in the appendix there is discussion of how the feature system used to represent cases in this chapter was chosen.

6.2 Case paradigms

6.2.1 *Basic facts*

I begin with some basic assumptions in morphological analysis. Any morphological analysis begins with the segmentations of words. This segmentation identifies the morphemes, the structural units of words. A morpheme is contrastive with respect to another morpheme if it is associated with different values of at least one feature (see section 6.3.1 for a formal definition of morphological contrast).

Consider two examples of paradigms. These two examples involve case systems–which will be the focus of my investigation of the notion of paradigm–and represent the two polar opposites in the case of these systems: the third nominal declension in Old French and the /-a/ declension of Sanskrit. Old French has a minimally reduced two case system; Sanskrit has a full-fledged seven case system.[1,2] In addition, Sanskrit has a dual number that Old French does not have.

(6.1) Old French third nominal declension:

	Singular	Plural
Nominative	*chiens*	*chiens* 'dog'
Oblique	*chien*	*chiens*

(6.2) Sanskrit /-a/ declension:

SING.		
N.	*devas*	(*/dev-a-s/*) 'god'
G.	*devasya*	(*/dev-a-sya/*)
D.	*devāya*	(*/dev-a-ya/* + thematic vowel lengthening)
A.	*devam*	(*/dev-a-m/*)
L.	*deve*	(*/dev-a-i/*)
Abl.	*devāt*	(*/dev-a-t/* + thematic vowel lengthening)
Ins.	*devena*	(*/dev-a-ina/*)

[1] According to Blake (1994), a seven case system such as that of Sanskrit is the most common maximal case system if differentiations in the local cases such as those found in Uralic or in Caucasian languages are not considered.

[2] Sanskrit has also a vocative case. I assume that this case has morphological and syntactic properties quite different than the other seven cases. I will systematically disregard this case throughout the chapter.

DUAL		
N.	*devāu*	(*/dev-a-u/* + thematic vowel lengthening[3])
G.	*devayos*	(*/dev-a-i-aus/]* + /-i-/ insertion)
D.	*devābhyam*	(*/dev-a-bhyam/* + thematic vowel lengthening)
A.	*devāu*	(*/dev-a-u/* + thematic vowel lengthening)
L.	*devayos*	(*/dev-a-i-aus/]* + /-i-/ insertion)
Abl.	*devābhyam*	(*/dev-a-bhyam/* + thematic vowel lengthening)
Ins.	*devābhyam*	(*/dev-a-bhyam/]* + thematic vowel lengthening)
PLU.		
N.	*devās*	(*/dev-a-s/* + thematic vowel lengthening)
G.	*devānām*	(*/dev-a-nām/* + thematic vowel lengthening)
D.	*devebhyas*	(*/dev-a-i-bhyas/]* + /-i-/ insertion)
A.	*devān*	(*/dev-a-n/* + thematic vowel lengthening)
L.	*deveṣu*	(*/dev-a-i-su/]* + /-i-/ insertion)
Abl.	*devebhyas*	(*/dev-a-i-bhyas/]* + /-i-/ insertion)
Ins.	*devāis*	(*/dev-a-is/* + thematic vowel lengthening)

In comparing the Sanskrit */a/*-declension and the Old French third declension, one observes that in Old French, the exponent */-Ø/* of the singular represents seven case functions which in Sanskrit are instead represented by different exponents. In Old French, the exponent */-Ø/* represents the syncretism of six different cases.

Still, when we look at both Sanskrit and Old French, we realize that the phonological exponents of the different grammatical properties characterizing the same paradigm can be identical. Thus, in Old French, */-s/* is the exponent of the nominative, singular and plural, and oblique plural. In Sanskrit, */-u/* is the exponent of the nominative and accusative dual, */-bhyam/* and */-bhyas/* are the exponent of the dative-ablative-instrumental dual, and of the dative-ablative plural, respectively. Again we are seeing a syncretism between these different cases.

It is important at this point to notice that the notion of case was developed by Greek and Latin grammarians mainly as a way of expressing meaningful generalizations on case exponents in systems characterized by massive syncretism. Cases are traditionally recognized on the basis of a distinction of case forms for groups of nouns, i.e., for declensional classes of nouns.

[3] In the nominative and accusative dual, the suffixal /-u/ becomes a coda glide because of an independent syllabification process. The fact that the thematic vowel is lengthened prevents the Sandhi operation by which /a/ + /u/ monophthongizes into /o/. Monophthongization affects only short /a/. Examples of this monophthongization process can be seen in the locative and instrumental singular where [a] + [i] monophthongize into [e].

There is no requirement that the distinction be made for all classes of nouns. In Sanskrit, as in Latin (see table (6.7) below) and in other Indo-European case languages, the nominative and accusative have contrastive exponents for masculine and feminine nouns, but there is syncretism of this contrast with neuter nouns (see also the Sanskrit dual above). In Latin, there is also syncretism of nominative and accusative with plural nouns of the fourth and fifth declensions and third declension consonant stems. Nevertheless, we recognize the distinction as applying to all nouns, since it allows us to make exceptionless generalizations about the exponents used for various functions in various syntactic contexts (Blake 1994).

In Latin, for instance, we want to be able to make statements like those in (6.3):

(6.3) (i) The accusative is used to express the direct object.

(ii) The accusative is used to express the object of prepositions such as *ad, per, trans*, etc.

(iii) The accusative is used to express duration: *XXVII annos* 'for 27 years.'

(iv) The accusative is used to express direction of motion: *Romam venit* 'He comes to Rome'.

It does not matter, for the purposes of these rules, that the accusative is realized by a form identical to the nominative in some paradigms. The issue is that the Accusative is identified as a single abstract property, or single set of abstract properties, which is associated with a number of syntactic functions and which is morphologically realized as a set of different exponents. Thus, morphological cases mediate the mapping between syntactic functions and surface case exponents.

This is not the only way of dealing with syncretism. We could recognize only the formally distinct exponents in each paradigm and relate these directly to syntactic functions. For the first declension singular (see table in (6.7) below), there would be the exponents */-Ø/*, */-m/*, and */-i/*. For the second declension singular non-neuter, there would be the exponents */-s/*, */-m/*, */-i/* and */-Ø/*, and so on. Rules for encoding syntactic functions would have to refer to these exponents. For example, the rule in (6.3i), which states that the direct object is expressed in the accusative case, would have to be changed as in (6.4):

(6.4) The direct object is expressed thus:
With masculine and feminine singular nouns of any declension the exponent */-m/* is used.

With plural nouns of the first and second declensions the exponent /*-s*/ is used.
With plural nouns of the third, fourth, and fifth declensions and with all neuters the exponent /*-a*/ is used.

In the traditional descriptions the indirect object is described as being in the dative. If we decided not use the notion of case and to directly correlate exponents to syntactic functions, we would have rules like the following:

(6.5) The indirect object is expressed as follows:

With nouns of first, third, and fourth declensions singular the exponent /*-i*/ is used.

With nouns of the second declension singular the exponent /Ø/ is used.

With nouns of the first and second declensions plural the exponent /*-is*/ is used.

With nouns of the third, fourth, and fifth declensions plural the exponent /*-ibus*/ is used.

The problem with this approach is that the list of case forms given in (6.4) for the direct object would have to be repeated for all the functions of the traditional accusative, of which there are about four. Similarly the list of case forms given in (6.5) for indirect object would have to be repeated for all the functions of the traditional dative, of which there are six or so (Blake 1994).

This shows that an attempt to link exponents directly to syntactic functions results in a quite complex and redundant grammar. By using cases as in (6.3) we achieve a significant simplification of grammar.

Let us consider again the case syncretisms that we observed in Old French and Sanskrit. As noted above, we can clearly distinguish two types of syncretism. In the singular oblique /-Ø/ of Old French, this exponent is representing case functions like the genitive that do not have an overt morphological realization anywhere in the nominal system of this language. In contrast, in the */-bhyam/* of the dative-ablative plural of Sanskrit, we are dealing with a single exponent of two case functions (the dative and the ablative) that otherwise have contrastive exponents in the singular.

Meiser (1992) (see also Ringe 1995 on this distinction) distinguishes between functional syncretism and formal syncretism. Functional syncretism involves the falling together of two morphosyntactic categories into a single one across the morphology of a language. Formal syncretism, in contrast, involves the use of the same form to express morphosyntactic categories that are otherwise morphologically contrasting in a language. Here I will

replace this terminology and call the first absolute syncretism and the second contextual syncretism. I will detail their workings by considering case systems.

Absolute syncretism in a case system involves the syncretism between a case that is morphologically realized in the language and a case that is not morphologically expressed in that language but that is morphologically expressed in other languages. For example, this is the situation of the oblique in Old French that realizes cases such as the genitive, the dative, the accusative, and the ablative that were morphologically contrastive in Latin. Likewise, it is the case of the Latin ablative that realizes cases such as the ablative, locative, and instrumental that are contrastive in Sanskrit. Historically, absolute syncretism involves the replacement a given case exponent with another case exponent across all nominal classes and nominal categories.[4] Below I will propose that absolute syncretism is obtained by changing the feature bundles of the terminal nodes of the morphosyntax.

In contrast, contextual syncretism in a case system involves the syncretism between cases that are morphologically realized in this system. It involves replacement of a given case exponent with another case exponent only in certain nominal classes or in certain grammatical categories such as the plural or the dual. In the Old French declension in (6.3) we observe contextual syncretism among the nominative singular, the nominative plural, and the oblique plural where we find the exponent /*-s*/. In Sanskrit there is contextual syncretism in the dative, ablative, and instrumental dual where we find the same exponent /*-bhyam*/, in the genitive and locative dual where we find the exponent /*-yaus*/, and in the dative and ablative plural where we find the exponent /*-bhyas*/. Below I will propose that contextual syncretism is accounted for by considering the feature assignments of the exponents of the vocabulary items.

To summarize, case systems present two major problems for description. One is the problem of distinguishing the cases; the other is the problem of describing their meaning and function. Distinguishing the cases is a problem, since nouns belonging to different declensional classes may exhibit a different

[4] Observe that I am not implying that any two cases that a language L_1 distinguishes will be merged neatly into just one case in another language, L_2, that lacks that distinction. Consider Latin, which lacks the instrumental but has an ablative that has the instrumental among its functions, and Classical Greek, which lacks an ablative as well as an instrumental. What will be proposed here does not predict that the functions of the ablative in a language such as Latin are absorbed by just one case in Classical Greek. In fact, some of the Latin ablative's functions (notably the "instrumental" ones) are fulfilled by the Greek dative while some (notably the "ablative" ones) are fulfilled by the genitive. As discussed below in section 6.3.4.2, this depends on the patterns of absolute syncretism characterizing the diachronic development of Classical Greek that are simply different from those characterizing the diachronic development of Latin.

range of contextual syncretisms. As we saw above, the traditional solution to this problem is to identify cases across declensional classes on the basis of the functions they have in common. Although this solution allows a simplification of grammatical statements as we saw above, it is still not satisfactory from the point of view of morphological analysis, for it categorizes as distinct exponents that are otherwise identical. In fact, traditional grammars of Sanskrit list the */-bhyas/* of the dative plural and the */-bhyas/* of the ablative plural as two different entries. The same occurs in Latin where the */-i:/* of I declension dative (cf. rosae) and the */-i:/* of the I declension genitive (cf. rosae) are treated as different.

Describing the meaning and function of the cases traditionally involves finding a principal meaning, which is reflected in the label of the case, as well as listing a range of separate meanings or functions. When we have absolute syncretism, this solution becomes particularly cumbersome. Consider the Classical Greek */o-/* declension below:

(6.6)

SING.			
N.	ἀδελφ os	(< *adelph -o-s*)	'brother'
G.	ἀδελφ*ν*	(< *adelph -o-io*)[5]	
D.	ἀδελφ*ῳ*	(< *adelph -o-i*) (+thematic vowel lengthening and laxing)	
A.	ἀδελφ*ον*	(<*adelph -o-n*)	
DUAL			
N.	ἀδελφ*ω*	(<*adelph -o-Ø*) (+thematic vowel lengthening and laxing)	
G.	ἀδελφ*οιν*	(<*adelph -o-in*)	
D.	ἀδελφ*οιν*	(<*adelph -o-in*)	
A.	ἀδελφ*ω*	(<*adelph -o-Ø*) (+thematic vowel lengthening and laxing)	
PLUR.			
N.	ἀδελφ*οι*	(<*adelph -o-i*)	
G.	ἀδελφ*ων*	(<*adelph -o-ɔ:n*)	
D.	ἀδελφ*οις*	(<*adelph -o-is*)	
A.	ἀδελφ*ους*	(<*adelph -o-ns*)	

[5] To understand the different surface forms of this declension, one must know the following:

i. /o/ is the [+ATR] short vowel [*o*], /*ω* /is the [−ATR] long vowel [ɔ:].

ii. Adjacent vowels contract in Greek; in (6.6) we have the following contractions: [*o* + ɔ:]→[ɔ:], [o + o]→[*o*:] (written o*ν*) . The long [+ATR] vowel [*o*:] later became [u:]) (see Noyer 1997 on Greek vowel contractions).

iii. Intervocalic /i-/ is syllabified as a glide and deleted. Thus in the case of the genitive, we have the following changes: */oio→oyo→oo→*o:/. I am assuming that these diachronic changes also hold synchronically. As an alternative synchronic analysis one can assume that the

In Classical Greek there is absolute syncretism between the genitive and the ablative, and between the dative, the locative, and the instrumental. When one attempts to account for the uses of the dative, or those of the genitive, we have to put together meanings and functions that apparently do not have anything in common. Therefore there is no clear way of relating the syntax to the morphological surface of the language other than by a stipulative list of function-case correlations.

6.2.2 *Contextual and absolute syncretism in Latin*

An investigation of contextual and absolute syncretism in the case paradigms of Latin, which are given in (6.7), will allow us to understand these phenomena better. Two characteristics of Latin are relevant here: the presence of massive contextual syncretisms and the presence of the absolute syncretism between the ablative and instrumental, and the absolute syncretism we observe for the locative which is syncretic with the dative-genitive in nouns of towns and small islands and with the ablative in all other nouns.

The five declensions of Latin:

(6.7)

	First	Second			
	porta, -ae	*amîcus, -î*	*puer, -î*	*ager, -grî*	*donum, î*
	f., 'gate'	m., 'friend'	m., 'boy'	m., 'field'	n., 'gift'
SING.					
N.	*port-a*	*amîc-u-s*	*puer*	*ager*	*dōn-u-m*
G.	*port-ae*	*amîc-î*	*puer-î*	*agr-î*	*dōn-î*
D.	*port-ae*	*amîcō*	*puer-ō*	*agr-ō*	*dōn-ō*
A.	*port-a-m*	*amîc-u-m*	*puer-u-m*	*agr-u-m*	*dōn-um*
Ab.	*port-ā*	*amîc-ō*	*puer-ō*	*agr-ō*	*dōn-ō*
PLU.					
N.	*port-ae*	*amîc-î*	*puer-î*	*agr-î*	*dōn-a*
G.	*port-ā-r-um*	*amîc-ō-r-um*	*puer-ō-r-um*	*agr-ō-r-um*	*dōn-ō-r-um*
D.	*port-î-s*	*amîc-î-s*	*puer-î-s*	*agr-î-s*	*dōn-î-s*
A.	*port-ā-s*	*amîc-ō-s*	*puer-ō-s*	*agr-ō-s*	*dōn-a*
Ab.	*port-î-s*	*amîc-î-s*	*puer-î-s*	*agr-î-s*	*dōn-î-s*

genitive singular ending is /-Ø/ and that there is lengthening of the thematic vowel in this case.

iv. Coda [n] is lost before tautosyllabic [s]. When this occurs, the preceding vowel lengthens. (see the accusative plural: /ons→o:s/). We need to hypothesize this shape for the accusative plural ending because of historical reasons. I assume it to make the synchronic relationship with the accusative singular ending explicit. An alternative synchronic analysis can assume the ending /-s/ for this Case coupled with lengthening of the thematic vowel.

	Third				
	rēx, rēgis	*corpus, -oris*	*cîvis, -is*	*urbs, -is*	*mare, -is*
	m., 'king'	n., 'body'	m., 'citizen'	f., 'city'	n., 'sea'
SING.					
N.	*rēx*	*corpus*	*cîv-i-s*	*urb-s*	*mar-e*
G.	*rēg-i-s*	*corpor-i-s*	*cîv-i-s*	*urb-i-s*	*mar-i-s*
D.	*rēg-î*	*corpor-î*	*cîv-î*	*urb-î*	*mar-î*
A.	*rēg-e-m*	*corpus*	*cîv-e-m*	*urb-e-m*	*mar-e*
Ab.	*rēg-e*	*corpor-e*	*cîv-e*	*urb-e*	*mar-î*
PLU.					
N.	*rēg-ē-s*	*corpor-a*	*cîv-ē-s*	*urb-ē-s*	*mar-i-a*
G.	*rēg-um*	*corpor-um*	*cîv-i-um*	*urb-i-um*	*mar-i-um*
D.	*rēg-i-bu-s*	*corpor-i-bu-s*	*cîv-i-bu-s*	*urb-i-bu-s*	*mar-i-bu-s*
A.	*rēg-ē-s*	*corpora*	*cîv-ē-s*	*urb-ēs*	*mar-i-a*
Ab.	*rēg-i-bu-s*	*corpor-i-bu-s*	*cîv-i-bu-s*	*urb-i-bu-s*	*mar-i-bu-s*

	Fourth		Fifth
	frūctus, -ūs	*cornū, -ūs*	*di-ē-s, diēî*
	m., 'fruit'	n., 'horn'	m., 'day'
SING.			
N.	*frūct-u-s*	*corn-ū*	*di-ē-s*
G.	*frūct-ū-s*	*corn-ū-s*	*di-ē-î*
D.	*frūct-u-î*	*corn-ū*	*di-ē-î*
A.	*frūct-u-m*	*corn-ū*	*di-e-m*
Ab.	*frūct-ū*	*corn-ū*	*di-ē*
PLU			
N.	*frūct-ū-s*	*corn-u-a*	*di-ē-s*
G.	*frūct-u-um*	*corn-u-um*	*di-ē-r-um*
D.	*frūct-i-bu-s*	*corn-i-bu-s*	*di-ē-bu-s*
A.	*frūct-ū-s*	*corn-u-a*	*di-ē-s*
Ab.	*frūct-i-bu-s*	*corn-i-bu-s*	*di-ē-bu-s*

Let us begin with an analysis of the suffixes characterizing Latin inflectional morphology (cf. Halle and Vaux 1997). Each word class is characterized by a common vocalic element that is traditionally called the thematic vowel. The thematic vowels of Latin are given in (6.8):

(6.8) TV → a in the env. [I]
TV → o in the env. [II]
TV → i in the env. [III]
TV → u in the env. [IV]
TV → eː in the env. [V]

Various processes of lengthening, lowering, raising and deletion affecting the thematic vowel must be unparsed (cf. 31–33).

Once we subtract the thematic vowel from the desinences, we obtain the different case endings. They are listed in (6.9–6.10).

(6.9) Singular:

	a-stems	o-stems	C-stems mixed	i-stems	u-stems	ē-stems
NOM	*-Ø*	*-s*	*-s*	*-s*	*-s*	*-s*
GEN	*-i:*	*-i:*	*-s*	*-s*	*-s*	*-s*
DAT	*-i:*	*-Ø*	*-i:*	*-i:*	*-i:*	*-i:*
ACC	*-m*	*-m*	*-m*	*-m*	*-m*	*-m*
ABL	*-Ø*	*-Ø*	*-Ø*	*-Ø*	*-Ø*	*-Ø*

(6.10) Plural:

	a-stems	o-stems	C-stems mixed	i-stems	u-stems	ē-stems
NOM	*-i:*	*-i:*	*-s*	*-s*	*-s*	*-s*
GEN	*-r-um*	*-r-um*	*-um*	*-um*	*-um*	*-um*
ACC	*-s*	*-s*	*-s*	*-s*	*-s*	*-s*
DAT	*-i:-s*	*-i:-s*	*-bu-s*	*-bu-s*	*-bu-s*	*bu-s*

Given the constituent structure in (6.11) produced by the morphology (see Calabrese 1998 for discussion) the suffixes in (6.9–6.10) are inserted in the fused case-number terminal node.

(6.11) $[[[\text{stem}] + \text{Thematic Vowel}]_N + \text{Number-Case}\ ]_N$

Let us now turn to the syncretisms we observe in the Latin system. I consider only the basic cases we find in Indo-European languages and omit from the analysis cases such as the comitative, the purposive, or the locational cases such as the allative, elative that were never morphologically realized in these languages. First of all, there is absolute syncretism between ablative and instrumental. The instrumental is not morphologically realized in Latin, and the ablative is used to represent the grammatical function of the instrumental:

(6.12) *occidere gladio* 'to kill with a sword'

The locative is also not morphologically realized in Latin. I consider the absolute syncretism that we observe in this case below.

Secondly, we also observe various cases of contextual syncretism, among which are:

(6.13) (i) between nominative and accusative in neuters

(ii) between the genitive and the dative in the singular of I and V declensions

(iii) between the dative and the ablative in the II declension

(iv) between the dative and the ablative in the plural of all declensions

(v) between nominative and accusative in the plural of III, IV, V declensions

In the analysis developed below in sections 6.3.2 and 6.3.3, contextual syncretism is accounted for by the feature assignments of the exponents or of morphophonological changes, while absolute syncretism involves changing the feature bundles of the terminal nodes of the morphology.

The difference between these two types of syncretism is shown in concord. In Latin adjectives agree with their head noun in case, number, and gender. Adjectives belong either to the first and second declensions (e.g., *bonus* (masc), *bona* (fem), *bonum* (neuter)) or to the third (e.g., *tristis* (masc and fem., third declension adjectives do not distinguish gender), *triste* (neuter)). Now, when an adjective makes more distinctions than the noun it modifies, the appropriate case form of the adjective is chosen. Thus, we have the following situation (*tristis* III decl., *puella, puellae* I decl., *rex, regis* III decl., *diēs, diēi* V decl.):

(6.14) Genitive: *tristis puellae / regis / dieī* 'of the sad girl/king/day'

(6.15) Dative: *tristī puellae / regī/ dieī* 'to the sad girl/king/day'

In the word form *puellae* of I declension, for instance, there is contextual syncretism between genitive and dative: the ending of */-ae/* can realize the genitive or the dative. If it is modified by a third declension adjective like *tristis*, which distinguishes between genitive *tristis* and dative *tristī*, the form of the adjective which is appropriate to the syntactic context is chosen. Therefore, we have to say that concord copies only the features of the terminal node of the morphosyntax, i.e., the output of absolute syncretism.[6] The presence of contextual syncretism–a type of syncretism that is determined by lexical features such as declensional class membership–in the forms of the head noun does not matter.

One outstanding problem of Latin grammar involves deciding whether or not there is a locative case. For now I will show that a solution of this problem can be found only if we rely on the notion of absolute syncretism. Later in section 6.3.4.2, I will propose a formal analysis of what happens in this case.

[6] Since absolute syncretism is a post-syntactic operation, it follows that the operation of adjectival concord we see here must also be post-syntactic. The consequences of this result cannot be discussed here since they are not directly relevant to the topic of this chapter. I leave this issue to future research.

Location in Latin is normally expressed by the ablative and usually governed by the preposition *in*. However, with singular names of towns and small islands, where no preposition is used, location is expressed by case forms identical to the genitive/dative of names belonging to the first or second declension singular: *Rōmae* 'at Roma', *Mīlētī* 'at Miletus' (and nouns such as *proximae* 'in proximity'). There are a few third declension singular names with forms the same as the dative: *Karthāginī* 'in Carthage' (although the ablative *Karthāgine* is an alternative). There is also *rūrī* (third declension) 'in the country' and *domī* 'at home'. *Domus* 'home' has a mixture of second and fourth declension forms. In all of these cases we can say that we are dealing with the vocabulary item /*-i*:/ identical to that of the dative-genitive singular (see (6.26)).

Since the expression of location involves different patterns of syncretism in different declensions, we could assume the following: 1) Latin has a locative case; 2) there is contextual syncretism between this case and the genitive/dative in singular nouns of towns and small islands (in addition to *rūrī* and *domī*, *proximae*.) In all other nouns and in the plural nouns, instead, there would be contextual syncretism between the locative and the ablative.

This hypothesis, however, is easily rejected when we consider concord in the phrases in (6.16):

(6.16) *meae domī (Pl. Au 432)* 'at my home' vs. *villā meā*
domī suae (Cic. N.D. 381) 'at his home' vs. *urbe copiosā*
'at my villa'
'in a wealthy town'
proximae viciniae habitat (Pl. Ba 205–6) 'he lives very close'

Consider the first two phrases *meae domī* and *villā meā*. The case form *villā* is ablative; *domī* is a genitive/dative "locative".

If we account for the contrast between *domī* and *villā* in terms of contextual syncretism, we are assuming that both forms are inserted in a terminal node characterized by the same feature bundle, the locative in this case. Therefore, we expect only one form of the adjective to appear insofar as concord depends only of the features of the terminal node. However, then we have to explain the opposition between the two forms of the adjective: *meae*, which is required by *domī*, and *meā*, which is required by *villā*. They cannot be due to contextual syncretism since, as shown in (6.13), contextual syncretism patterns found in the head noun are not transmitted to the modifying adjective. Therefore, we have to conclude that the contrast between *domī* and *villā* must be accounted for by changing the feature bundle of the terminal node of the head noun. We are dealing with a case of absolute syncretism.

6.3 Analysis

6.3.1 *Features, morphological contrast and the notion of paradigm*

All possible morphological contrasts in any language must be expressible in terms of features. These "morphosyntactic" features are universal; the human mind is one and categorizes life experience and reality in the same way. These features provide a range of possible feature combinations that languages can make use of. Therefore, I assume that if a language has a particular morphological contrast, this contrast must be expressible in terms of these universal features. This also holds for unusual morphological properties. Take an unusual case such as the "evitative" found in Australian languages (Blake 1994) or the contrast between the "reportative" and the "eyewitness" past tense in Turkish; they must be accounted for by reducing them to known features or a new universal feature must be introduced. It is the duty of markedness theory to account for why these morphological categories are rarely used across languages. It is the same in phonology. All possible phonological contrasts in any language must be expressible in terms of universal features. Suppose that we observe a phonological contrast between two segments in a particular language, say between the protruded round front vowel /y/ and the non-protruded rounded front vowel [ʉ] of Swedish. If we cannot reduce this contrast to an already known feature, i.e., to the feature [ATR], for example, we have to postulate a new feature, [Lip Protrusion] and assume that this feature belongs to UG. Markedness theory must then account for why this feature is rarely used across languages.

Before introducing the feature system used in this chapter to account for cases, I want to look into the formal conditions under which morphological features determine morphological contrast. Consider three features X, Z, Y, of a given terminal node of the morphosyntax in a language L. We have the combinations in (6.17):

(6.17)

+X	+X	−X	−X	+X	+X	−X	−X
+Z	−Z	+Z	−Z	+Z	−Z	+Z	−Z
+Y	+Y	+Y	+Y	−Y	−Y	−Y	−Y

Assume that each terminal node in (6.17) has a different exponent as in (6.18) (where $\Phi_n \neq \Phi_{n+1}$):

(6.18)

+X	+X	−X	−X	+X	+X	−X	−X
+Z	−Z	+Z	−Z	+Z	−Z	+Z	−Z
+Y	+Y	+Y	+Y	−Y	−Y	−Y	−Y
Φ_1	Φ_2	Φ_3	Φ_4	Φ_5	Φ_6	Φ_7	Φ_8

A morphological contrast exists in a language under the following condition:

(6.19) A morphological feature X is contrastive in L

(i.) if there is at least a phonological exponent S in L, where S is inserted in a terminal node containing [αX, βZ] and there is a phonological exponent T (S≠T) where T is inserted in a terminal node containing [$-\alpha$X, βZ]; or

(ii.) there is at least one readjustment rule in L that includes either [αX] or [$-\alpha$X] in its structural description (see later discussion).

The vocabulary items and the outputs of the readjustment rules associated with contrastive morphosyntactic features are the *morphological realizations* of these features.

Because of (6.19), all of the features in (6.18) are contrastive and {$\Phi^1, \ldots \Phi^8$} are the morphological realizations of the features {X, Y, Z}. Let us exemplify (6.19) in the case of the case systems discussed above.

I assume the following case feature system (see Appendix for discussion).

(6.20)

	Nom.	Acc.	Gen.	Dat.	Loc.	Abl.	Inst.
Peripheral	−	−	+	+	+	+	+
Source	−	−	+	−	−	+	−
Location	−	−	−	−	+	+	+
Motion	−	+	−	+	−	+	+

Given the case features in (6.20), the presence of the exponent /-Ø/ in the singular oblique of *chien-*/-Ø/ (as opposed to /-*s*/ of *chien-s* in the oblique plural, in the nominative singular/plural) indicates that the features [motion] and [plural] are contrastive in Old French. The oblique, i.e, the non-nominative case, is [+motion]. The cases of Sanskrit and Latin are obviously more complex. The same is true for Classical Greek. If we consider the ablative forms of Latin and Sanskrit, we need to say that the features [source, location] and [motion] are contrastive in both languages. In the case of the dative in Classical Greek only the feature [source] is contrastive. Observe that in Latin it is not the presence of actual idiosyncratic exponents that make the features [source, location] and [motion] contrastive but the presence of the readjustment rules of lengthening and lowering which apply to the thematic vowels in singular ablative forms (see (6.31) below).

Given the notions just introduced, the notion of paradigm can now be formally defined: a paradigm is the set of the morphological realizations of the contrastive features of a given terminal node of the morphosyntax. Thus, {$\Phi^1, \ldots \Phi^8$} is the paradigm formed by the features {X, Y, Z} in (6.18).

6.3.2 *Vocabulary items and contextual syncretism*

In the case systems considered before, there is contextual syncretism: the phonological exponents of the different terminal nodes in a paradigm are often identical. In Distributed Morphology, the phonological exponents of the different morphemes are listed in the vocabulary as parts of the vocabulary items. A vocabulary item consists of a phonological exponent and an associated set of features that governs its insertion in the terminal nodes of the morphosyntax. A fundamental hypothesis in DM is that only a subset of the morphological features provided by the terminal nodes of the morphosyntax is required for selecting the correct phonological exponent, i.e., vocabulary items must be underspecified. The principle that governs feature assignments to vocabulary items, originally proposed in Calabrese (1998), is given in (6.21):[7]

(6.21) For each vocabulary item I in a paradigm P, the minimal set of features able to account for the maximal distribution of I in P is assigned to I.

Once the feature assignments of the vocabulary items is determined, we can account for how their phonological exponents are inserted in the terminal nodes of the morphosyntax. This insertion is governed by the Subset Principle (6.22):

(6.22) The phonological exponent of a Vocabulary item is inserted into a morpheme in the terminal string if the item matches all or a subset of the grammatical features specified in the terminal morpheme. Insertion does not take place if the Vocabulary item contains features not present in the morpheme. Where several Vocabulary items meet the conditions for insertion, the item matching the greatest number of features specified in the terminal morpheme must be chosen. (Halle 1997)

Given (6.22), only the phonological exponent /-Ø/ of Old French in (6.1) needs to be maximally specified as in (6.23). The exponent /-s/ instead will not have any features; it is what is called the elsewhere item, the item whose distribution cannot be captured by any subset of the features relevant for the other items of the list. This item will be inserted when no other item of the list can be inserted.

(6.23) Old French:

a. Ø ↔ [+motion, −plural]

b. /-*s*/ ↔ Ø (Elsewhere)

[7] Adger (2005) proposes a similar approach to the assignment of feature specifications to lexical items. According to him, they are assigned by a procedure governed by "an evaluation metric [seeking] maximal generalizations (hence minimally specified lexical items)" (Adger 2005: 18).

In the case of Sanskrit /a/-declension, we need the vocabulary items in (6.24):[8]

(6.24) Sanskrit:

a.	*/-bhyam/*	↔ [+peripheral, +motion, −singular, −plural]	(D,A&I Du)
b.	*/-yaus/*	↔ [+peripheral, −singular, −plural]	(G&LDu)
c.	/-u/	↔ [−singular, −plural]	(N&ADu)
d.	*/-is/*	↔ [−source, +location, +motion, +plural]	(IPl)
e.	*/-su/*	↔ [+peripheral, +location, −motion, +plural]	(LPl)
f.	*/-bhyas/*	↔ [+peripheral, +motion, +plural]	(D&AblPl)
g.	*/-naːm/*	↔ [+source, −location, +plural]	(GPl)
h.	*/-n/*	↔ [+motion, +plural]	(APl)
i.	*/-ina/*	↔ [−source, +location, +motion]	(ISg)
j.	*/-ya/*	↔ [+peripheral, −source, −location]	(DSg)
k.	*/-t/*	↔ [+source, +location]	(AblSg)
l.	*/-i/*	↔ [+peripheral, +location]	(LSg)
m.	*/-sya/*	↔ [+source]	(GSg)
n.	*/-m/*	↔ [+motion]	(ASg)
p.	*/-s/*	↔ Ø	(NSg &P)

For the Classical Greek /o/-declension, we need the vocabulary items in (6.25):[9]

(6.25) Classical Greek:

a.	*/-in/*	↔	[+peripheral, −singular, −plural]	(G&DDu)
b.	*/-Ø/*	↔	[−singular, −plural]	(N&ADu)
c.	*/-is/*	↔	[+peripheral, −source, +plural]	(DPl)

[8] I assume that the dual is characterized by the feature specifications [−singular, −plural], the singular is [+singular, −plural], the Plural [−singular, +plural]. The combination [+singular, +plural] is not allowed.

[9] The somewhat simpler list of vocabulary items in (i) can be proposed if we segment the endings */-is/* of the dative plural and */-ns/* of the accusative plural into */-i+s/* and */-n+s/*, respectively. Under this analysis, we can extract the */-n/* of the accusative singular and the */-i/* of the dative singular from their respective plural counterparts. The remaining */s/* would be the elsewhere */-s/* in (6.25j.) which could fill an extra insertion site created by fission (see Halle and Vaux 1998 for a similar analysis for Latin */-bu-s/* and */-r-um* < */s-um/*)).

(i) Greek:

a.	*/-in/*	↔	[+peripheral, −singular, −plural]	(G&DDu)
b.	*/-Ø/*	↔	[−singular, −plural]	(N&ADu)
c.	*/-ɔːn/*	↔	[+peripheral, +plural]	(GPl)
d.	*/-i/*	↔	[+peripheral, −source]	(D)
e.	*/-i/*	↔	[+plural]	(NPl)
f.	*/-io/*	↔	[+peripheral]	(GSg)
g.	*/-n/*	↔	[+motion]	(A)
h.	*/-s/*	↔	Ø	(NSg)

d.	/-ɔ:n/	↔	[+peripheral, +plural]	(GPl)
e.	/-ns/	↔	[+motion, +plural]	(ASg)
f.	/-i/	↔	[+plural]	(NPl)
g.	/-i/	↔	[+peripheral, −source]	(DSg)
h.	/-io/	↔	[+peripheral]	(GSg)
i.	/-n/	↔	[+motion]	(ASg)
l.	/-s/	↔	Ø	(NSg)

The vocabulary items for all Latin declensions are listed in (6.26):

(6.26)

a.	/-um/	↔	[+peripheral, −motion, +plural]	(GPl)
b.	/-i:/	↔	[−peripheral, −motion, +plural]/[-neut, I, II] +_	(NPl I, II)
c.	/-bu-/	↔	[+peripheral, +motion, +plural]/[III, IV, V] +_	(D&AbPl. III-V)
d.	/i:/	↔	[+peripheral, −location, −plural]	(G&DSg)
e.	/a/	↔	[−peripheral, +plural]/[+neuter]+_	(N&APl. Nt)
f.	/-m/	↔	[+motion, −plural]	(ASg)
g.	Ø	↔	[−plural]	(Sg default)
h.	/s/	↔	[Ø]	Elsewhere

The ending [r-um](<-s-um) and [bu-s] are produced by a fission process whose discussion I omit here (see Halle and Vaux 1998, 228–29 for details).

The fact that /s/ is the elsewhere case in Latin allows us to account for the shape of the nominative and genitive singular. According to the list in (6.26), in these cases we should always expect the null exponent Ø, the default ending of the singular in the case of the nominative, and the morpheme /i:/ in the case of the genitive singular. This is not what we observe in the nominative of the II–IV declensions and in the genitive of the III–IV declensions. Following Halle and Vaux (1998), in these cases morphological impoverishment prevents the insertion of this exponent by deleting the feature [−pl][10]

(6.27) a. The feature [−plural] is deleted in the nominative of the II, III–IV declensions.

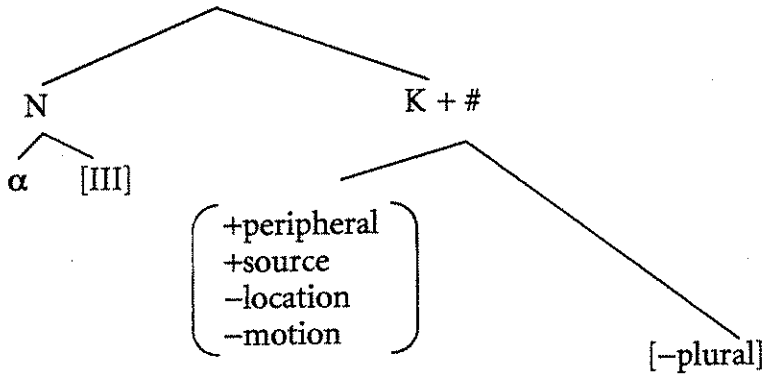
b. The feature [−plural] is deleted in the genitive of III–IV declensions.

Impoverishment operates in the following way. The terminal node of a genitive singular of the third declension nominal in Latin morphosyntax is given

[10] In Calabrese (2002), I propose a different approach to impoverishment. According to that proposal, impoverishment does not involve deletion of a feature but simply an operation that makes a given feature temporarily inaccessible during a certain insertion cycle. Therefore, during that cycle, a vocabulary item characterized by that feature cannot be inserted and a less specified item must be instead inserted, as in the traditional DM account. However, that feature can be accessed in later insertion cycles, and therefore it can be used by other vocabulary items or by other readjustment rules. (See Calabrese 2002 for examples and more discussion).

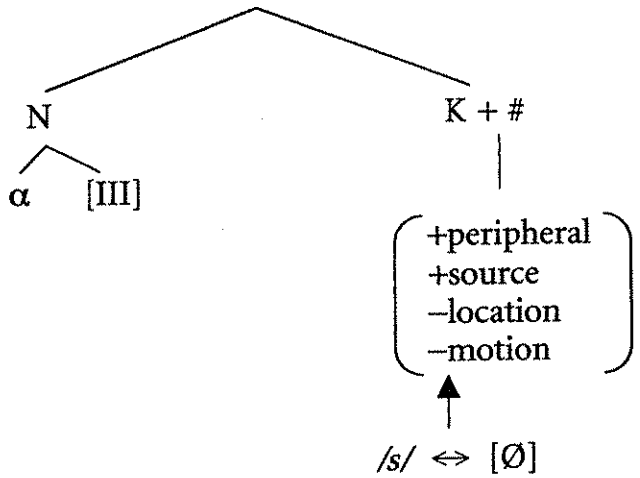
in (6.28). In (6.28) the vocabulary item in (6.26d.), i.e, /*i*:/↔[+peripheral, −location, −plural], should be inserted.

(6.28) a.



Given (6.27b.), the feature [−plural] is deleted as in (6.29). Therefore, neither the null morpheme Ø or the morpheme /*i*:/ of the list in (6.26) can be inserted in these cases. The elsewhere case /-*s*/ is instead inserted as in (6.28b.):

(6.28) b.



Another impoverishment operation is needed to account for the insertion of /Ø/ in the dative singular of the II declension.

(6.29) a. The feature [−location] is deleted in the environment [__ +peripheral] of the II declension.

b. The feature [−location] is deleted in the environment [__ +peripheral] of the neuters of the IV declension.

Assuming the vocabulary items in (6.26) and impoverishment, we have an account of contextual syncretism in the Latin case endings.

In addition, a set of readjustment rules is needed to account for the surface shape of the Latin case forms. This is of particular relevance here to account

for how the ablative is morphologically realized in Latin. The different forms of the ablative are provided below:

(6.30) a.

	First	Second	Third	Third	Fourth	Fifth
	porta, -ae	*amîcus, -î*	*rēx, regis*	*mare, -is*	*frūctus,-ūs*	*di-ē-s, ēî*
	f., 'gate'	m., 'friend'	m., 'king'	n., 'sea'	m., 'fruit'	m.'day'
SING.						
Ab.	*port-ā*	*amîc-ō*	*rēg-e*	*mar-î*	*frūct-ū*	*di-ē*
PLU.						
Ab.	*port-î-s*	*amîc-î-s*	*rēg-i-bu-s*	*mar-i-bu-s*	*frūct-i-bu-s*	*di-ē-bu-s*

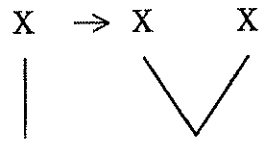
Given the analysis just proposed in (6.26), the case forms in (6.29) should have the shape in (6.30b.) where Ø is the default exponent of the singular and */-s/* is the elsewhere item. The complex ending */-bu-s/* is created through fission (not discussed here; see Halle and Vaux 1997 for more details):

(6.30) b.

SING.						
Ab.	*port-a-Ø*	*amîc-o-Ø*	*rēg-i-Ø*	*mar-i-Ø*	*frūct-u-Ø*	*di-ē-Ø*
PLU.						
Ab.	*port-a-s*	*amîc-o-s*	*rēg-i-bu-s*	*mar-i-bu-s*	*frūct-u-bu-s*	*di-ē-bu-s*

The following readjustment rules (Halle 1997) account for the surface shape we observe in (6.29):

(6.31) a. Rules lengthening the thematic vowel:

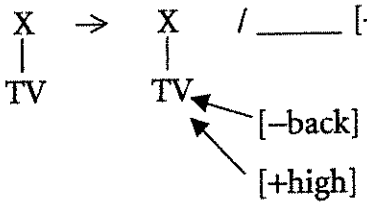


i. / ____ [+peripheral, +motion, I, II]

ii. / ____ [+source, +location, +neuter, −plural, III]

iii. / ____ [+source, +location, −plural, IV]

b. A rule fronting the thematic vowel of the dative/ablative in the I, II, and IV plural:



c. A rule lowering the thematic /i/ in the ablative in the non-neuters of the III declension:

[−back] → [−high]/ [$_{TV}$____][+source, +location, −neuter, −plural, III]

6.3.3 *Absolute syncretism*

6.3.3.1 *The basic idea* Let us turn to the issue of absolute syncretism. In the model I put forth here, after the mapping of syntactic grammatical relations and thematic roles into case features, we first establish what feature combinations are contrastively realized in the morphology. Only these feature combinations are relevant in the analysis of the system; all other combinations are not relevant–i.e., not used in the morphology. I will assume that they are disallowed by specific morphological constraints that will be discussed below. The disallowed feature combinations are then removed by featural repairs that change them into allowed combinations. These repairs are the processes that bring about absolute syncretism.[11] The feature specifications of vocabulary items and of the structural description of readjustment rules is established only by considering the relevant (allowed) feature combinations. The consequence of this is that only patterns of contextual syncretism, and not of absolute syncretism, are considered in the determination of these feature specifications. This is the analysis proposed above for the Old French, Sanskrit, Classical Greek, and Latin vocabulary items which was based on the tacit assumption that the only case feature combinations that ought to be considered in establishing the pattern of distribution of the different items are those in (6.32). The feature systems in (6.32) include only the feature specifications that are morphologically contrastive in the respective languages:

(6.32) i. For Old French:

	Nom.	Acc.
Peripheral	–	–
Source	–	–
Location	–	–
Motion	–	+

ii. For Sanskrit:

	Nom.	Acc.	Gen.	Dat.	Loc.	Abl.	Inst.
Peripheral	–	–	+	+	+	+	+
Source	–	–	+	–	–	+	–
Location	–	–	–	–	+	+	+
Motion	–	+	–	+	–	+	+

[11] An alternative model in which all possible feature combinations mapped from syntax are accessed during vocabulary insertion and where absolute syncretism is accounted for by assigning common feature specifications to the syncretic cases directly in the mapping from syntax to morphology will be discussed later in section 6.4.

iii. For Classical Greek:

	Nom.	Acc.	Gen.	Dat.
Peripheral	–	–	+	+
Source	–	–	+	–
Location	–	–	–	–
Motion	–	+	–	+

iv. For Latin:

	Nom.	Acc.	Gen.	Dat.	Abl.
Peripheral	–	–	+	+	+
Source	–	–	+	–	+
Location	–	–	–	–	+
Motion	–	+	–	+	+

In this way, all irrelevant non-contrastive feature combinations are eliminated and vocabulary items need to refer only to the limited set of contrastive features. A simplification of the feature specifications of the vocabulary items can, therefore, be achieved. Notice that such simplification cannot be obtained in a model such as that discussed below in section 6.4 in which all features specifications mapped from the syntax are accessed regardless of whether or not they are contrastive.

The issue is then to account for the different patterns of absolute syncretism: in the case of the oblique in Old French we have absolute syncretism among the accusative, the dative, the genitive, the ablative, the locative, and the instrumental; in the case of the dative of Classical Greek we have absolute syncretism among the dative, the locative, and the instrumental, whereas in the case of the genitive, that between the genitive and the ablative; in the case of Latin, we have absolute syncretism ablative–instrumental, locative–dative, or locative–ablative.

Consider Classical Greek. Given the universal set of features mapped from the syntax into the morphology (see (6.33)), I assume that there are feature-changing operations–similar to the rules of referral of Zwicky (1985) and Stump (1993)–which change the feature bundle of the instrumental and the locative of (6.33) into that of the dative, and the feature bundle of the ablative in (6.33) into that of the genitive. As discussed below in section 6.3.4.2, these operations–the operations that lead to absolute syncretism–are repairs triggered by the negative constraints on case feature combinations. We thus obtain (6.32iii.). The same occurs in Old French: these repair operations change the feature bundles of the dative, the genitive, the ablative, the locative, and the instrumental into that of the accusative (see 6.3.4.2 below for discussion of

Latin and a detailed analysis of absolute syncretism in Classical Greek and Old French).

(6.33)

	Nom.	Acc.	Gen.	Dat.	Loc.	Abl.	Inst.
Peripheral	–	–	+	+	+	+	+
Source	–	–	+	–	–	+	–
Location	–	–	–	–	+	+	+
Motion	–	+	–	+	–	+	+

For example, consider the Greek instrumental construction in (6.34a.) *τοῖς ὀφθαλμοῖς* 'with the eyes'. It contains the case form /-is/ which is identical to that found in the dative construction in (6.34b.). I assume that in both cases we have the same case terminal nodes in (6.35) in the morphosyntax. As discussed below, these two terminal nodes are initially different–with instrumental feature specifications in (6.36a.) and dative ones in (6.36b.)–when case features are mapped from the syntax into the morphosyntax. However, the instrumental in (6.36a.) is then changed into the dative in (6.36b.) by the feature change in (6.36c.) before vocabulary item insertion, as discussed below in section 6.3.4.2.

(6.34) a. *τοῖς ὀφθαλμοῖς ὁρῶμεν* 'we see with the eyes'
the-PlDat. eye-PlDat. see-1pl.

b. *τοῖς θεοῖς ευχομαι* 'we pray to the gods'
the-PlDat. god-PlDat pray-1pl.

(6.35) a. K (instrumental)
|
(+peripheral, –source, +location, +motion)

b. K (dative)
|
(+peripheral, –source, –location, +motion)

(6.36) a. [+location] → [–location]

b. K (instrumental → dative)
|
(+peripheral, –source, –location, +motion)

c. K (dative)
|
(+peripheral, –source, –location, +motion)

Before discussing the nature of the constraints that govern case paradigms and detailing the repair operations that these constraints trigger, I want to exclude a possible account for absolute syncretism based on the notion of underspecification. This is done in the next subsection.

6.3.3.2 *Against underspecification of absent cases* Before going on, I want to reject the hypothesis that the structure of a morphological paradigm with its patterns of absolute syncretism is accounted for by underspecifying morphosyntactic representations. This underspecification could be obtained by assuming that only the features of morphologically realized cases are active, and specified, in morphosyntactic representations. In contrast, those of the case that are not morphologically realized–i.e, those that undergo absolute syncretism–would be not active, and therefore left unspecified. This is a commonly accepted, albeit implicit, hypothesis: when traditional grammars state that Classical Greek has only four cases the implicit assumption is that the missing cases are simply not generated in the morphosyntax. This hypothesis has never been thought through adequately in the light of absolute syncretism patterns.

Let us consider Classical Greek. In Classical Greek we have four cases: the nominative, the accusative, the genitive, and the dative. We could account for this four-case system by assuming that only the features of these cases, but not of cases such as the ablative, the locative, the instrumental, etc., are specified in morphosyntactic representations. The featural representations of the cases are given in (6.37) where I assume the minimal amount of specifications:

(6.37) Feature specifications of Classical Greek morphosyntactic representations (with underspecification):

	Nom.	Acc.	Gen.	Dat.	Loc.	Abl.	Inst. ...
Peripheral			+	+			
Motion		+		+			

Given (6.37), the relevant vocabulary items of the Classical Greek *o*-declension could be specified as follows:

(6.38) Classical Greek:

a. /*-in*/ ↔ [+peripheral, –singular, –plural] (G&DDu)
b. /*-Ø*/ ↔ [–singular, –plural] (N&ADu)
c. /*-is*/ ↔ [+peripheral, +motion, +plural] (DPl)
d. /*-ɔ:n*/ ↔ [+peripheral, +plural] (GPl)
e. /*-ns*/ ↔ [+motion, +plural] (ASg)
f. /*-i*/ ↔ [+plural] (NPl)
g. /*-i*/ ↔ [+peripheral, +motion] (DSg)
h. /*-io*/ ↔ [+peripheral] (GSg)
i. /*-n*/ ↔ [+motion] (ASg)
j. /*-s*/ ↔ Ø (NSg)

But, as already mentioned, in Classical Greek there is absolute syncretism between the genitive and the ablative, and between the dative, the locative,

and the instrumental. This means that we have to insert the vocabulary items in (6.38c.) and (6.38g.)–the "dative endings"–also into the case terminal nodes of phrases with the syntactic functions of "instrumental" and "locative", and the vocabulary items in (6.38d.) and (6.38i.)–the "genitive" endings–also into the case terminal nodes of phrases with the syntactic functions of "ablative." However, given (6.37) and (6.38), this is not what we obtain. Instead, we predict insertion of (6.38j.)–the elsewhere ending. Playing with the feature specifications in (6.38) will not solve this problem: given that the case terminal nodes of the instrumental, locative, and ablative do not contain feature specifications, they will always be assigned the elsewhere case ending, contrary to the facts. Eliminating the elsewhere item in (6.38), together with assigning a feature specification to the nominative in (6.37) (say [−motion]) does not solve the problem either. If we do that, the result is that no vocabulary item would be inserted in the terminal nodes of the instrumental, locative, and ablative, which is again contrary to the facts. It follows that we cannot leave unspecified the terminal nodes of these syntactic functions. I assume that morphosyntactic representations are always fully specified. Only vocabulary items can be underspecified to account for distribution in paradigms and for the patterns of contextual syncretisms.

6.3.4 *Markedness theory and case systems*

6.3.4.1 *Morphological markedness* Before turning to an analysis of absolute syncretism, I need to discuss the issue of morphological markedness. The main proposal put forth here, in fact, assumes that the processes leading to absolute syncretism are due to markedness effects. It is a fact that the exponents[12] of certain morphological categories are more likely to disappear and be replaced by other exponents by absolute syncretism. I assume that these categories are to be characterized as being morphologically marked. Greenberg (1963) observes that languages seem to prefer affixal realization for categories such as the singular (here [+singular, −plural] in terms of features) or the plural ([−singular, +plural]) but not for the [dual] (−singular, −plural). I assume that this fact must be dealt with by a theory of morphological markedness. This theory should identify certain morphological features or combinations of morphological features as marked. I assume that the realization of marked morphological configurations as affixes with an idiosyncratic exponence is costly. Assuming that a general principle of economy governs language (see Calabrese 2005), languages should tend to avoid these costly morphological configurations. For example, although the

[12] Notice that with the term "exponent" here I am simplifying a little insofar as, in addition to exponents, morphophonological changes triggered by morphological features–i.e., readjustment processes (see section 6.3.2)— must also be included in the processes of absolute syncretism.

dual (featurally [−singular, −plural]) is morphologically realized with an idiosyncratic exponence in languages such as Classical Greek and Sanskrit, the common situation is that of Latin and Old French where plural forms are simply used for this number. Languages with a dual are much less common than languages without one. I assume that this is a markedness effect.

As for case systems, Blake (1994) observes that there are clear implicational relationships between the different cases. An implicational hierarchy of cases is given in (6.39). If we assume that the presence of more marked entities implies the presence of less marked ones, as originally proposed by Jakobson (1941), the hierarchy in (6.39) tells us that the nominative is the least marked case and the locative the most marked one:[13, 14]

(6.39) NOM < ACC < GEN < DAT < ABL < INST < LOC < OTHERS

The implicational hierarchy in (6.39) is supported by the typology of case systems in (6.40).

(6.40) Case systems:

a. Two cases:
   NOM - ACC(Obl) (e.g., in Old French, Chemehuevi, Kabardian)

b. Three cases:
   NOM - ACC - GEN (e.g., in Classical Arabic, Modern Greek)

c. Four cases:
   NOM - ACC - GEN - DAT (e.g., in Classical Greek, Nuer)

d. Five cases:
   NOM - ACC - GEN - DAT - ABL(Obl) (e.g., in Latin)
   NOM - ACC - GEN - DAT - INST(Obl) (e.g., in O. H. German)

e. Six cases:
   NOM - ACC - GEN - DAT - ABL - LOC (e.g., in Turkish)
   NOM - ACC - GEN - DAT - INST - LOC (e.g., in Slavic lgs)

f. Seven cases:
   NOM - ACC - GEN - DAT - ABL - INST - LOC (e.g., in Sanskrit, C. Armenian)

[13] See 6.3.4.2 for brief discussion of the ergative case.

[14] The implicational hierarchy in (6.39) is different from that proposed by Blake (1994). First of all, I propose that the locative is more marked than the ablative and the instrumental. Evidence for this is provided by the systems in (6.40) that show that it is the presence of the locative that implies the presence of the ablative and the instrumental and not vice versa. Secondly, to avoid ambiguity, I assume that each case can imply only one other case. No branching in the hierarchy is allowed. This assumption forces me to decide which case between the ablative and the instrumental is less marked. I propose that it is the ablative to be the least marked of the two. This hypothesis must be tested by further research.

g. Systems with more cases may include differentiations in the local cases (allative/perlative, etc.), the comitative, the purposive, the comparative, and some other special cases:
e.g., Tamil:
NOM - ACC - GEN - DAT - LOC - ABL - INST - COM
Toda:
NOM - ACC - GEN - DAT - LOC - ABL - INST - COM - PURP

Languages seem to prefer idiosyncratic case-marking for grammatical relations such as subject and object but not for grammatical relations expressing location or instrument. In terms of the theory of morphological markedness, cases such as the ablative, locative, instrumental, or the comitative and purposive are morphologically marked so that their realization as affixes with an idiosyncratic exponence tends to be avoided.

6.3.4.2 *A theory of morphological markedness, morphological repairs and an analysis of absolute syncretism* I assume that languages differ in their exploitation of morphological features and combinations of morphological features, just as languages differ in their exploitation of phonological features. Given a language L, the morphological features–or better the combinations of morphological features–that can appear in merged terminal nodes characterizing affixes are limited.

I propose that the restrictions on the exploitation of features in the terminal nodes of the morphosyntax result from constraints on combinations of morphological features (see the seminal work of Noyer 1992 on this issue). These feature constraints target the feature combinations of terminal nodes merged with stems into words.

Many feature combinations are excluded by universal prohibitions. Prohibitions are always active across languages. (I mark them with two asterisks.)

(6.41) **[+singular, +plural]

Other combinations are excluded by marking statements that characterize as costly the morphological realization of certain feature combinations as affixes. Marking statements may be active or deactivated on a language-specific basis. If a marking statement is active, the relevant combination of features must be changed.

I assume that the following marking statement characterizes morphological realization of duality in affixes as costly.

(6.42) *[−singular, −plural]/ [[ ]$_{root}$ (...)+ ___]$_{W}$

In Latin (and Old French) the marking statement in (6.42) is active. In contrast, (6.42) is deactivated in Classical Greek or Sanskrit. In Latin (and Old

French) only the unmarked configuration [+singular, −plural], [−singular, +plural] are morphologically realized in merged terminal nodes as affixes.

Calabrese (1998) proposed that each case is characteristically identified by a marking condition that constrains a case features combination (a case restriction from now on; see (6.43)). These case restrictions represent case feature combinations whose affixal realization is marked as costly. These case restrictions may be active or inactive in a language. If a case restriction is active in a language the relevant case is not present in the language. If it is inactive, the relevant case is present. The case restrictions are organized hierarchically. The lower a restriction in the hierarchy, the more probable is that it is active across languages. Thus the restriction characterizing the instrumental is in a low position in the hierarchy. This expresses the fact that the instrumental is more rarely found across languages. In their natural state, case restrictions are active. A case restriction is deactivated in a language L only if there is evidence that the relevant case is morphologically realized in L. Furthermore, I assume that a case restriction can be deactivated in a language only if case restrictions in higher position in the hierarchy are also deactivated. Nominative–accusative systems are characterized by the activity of the case restriction in (6.45a.) disallowing the ergative. Ergative systems are instead characterized by the activity of the case restriction in (6.45b.) disallowing the nominative.[15]

(6.43) The case restrictions:

a.	i.	*Locative:	*[+location, −source]/[_____, −motion]
	ii.	*Instrumental:	*[−source, +location]/[_____, +motion]
	iii.	*Ablative:	*[+location, +source]
	iv	*Dative:	*[−location, −source] /[___, +peripheral]
	v.	*Genitive:	*[+peripheral]
	vi.	*Accusative:	*[−peripheral, +motion]

The ranking is given in (6.44):

(6.44) vi ← v ← iv ← iii ← ii ← i

[15] In the case of the Salishan or Australian languages that display a nominative–accusative system in pronouns and an ergative system in nouns, we need to assume that the deactivation of a case restriction may be limited only to certain grammatical subsystems. Specifically, in the case of these languages one must say that (6.45b.) is deactivated only in the pronominal subsystem and that (6.45a.) is deactivated only in the nominal subsystem. In languages such as in Hindi and Georgian where the split nominative–accusative system vs. ergative system is across aspectual lines, (6.45a.b.) need to be (de)activated in the presence of certain aspectual nodes. Further research on these types of issues is obviously needed.

(6.45) a. Nominative–accusative systems:
*Ergative: *[−peripheral, +source]
b. Ergative systems:
*Nominative: *[−peripheral, −motion]

Observe that given the analysis proposed here we have to say that the case restrictions in (6.43) constrain case feature bundles only when they are merged with other constituents, that is, when they are morphologically realized as affixes, i.e., in the context [[ ]$_{root}$ (...)+ ___]$_W$.

I propose that absolute case syncretisms are due to active case restrictions. These active case restrictions trigger repair operations that adjust the disallowed feature configurations of the terminal nodes of the morphosyntax.[16,17]

I now consider how case restrictions operate synchronically and how their deactivation is detected. A case restriction is deactivated in a language L if its feature specifications are morphologically realized in L. There are situations in which the feature specifications of more than one case restriction have the same morphological realization. These situations are the outcomes of absolute syncretism processes. I propose that in such cases it is the least marked case restriction that gets deactivated. The other case restrictions remain active and trigger repairs converting by feature change operations (see below for discussion) their target feature bundles into that of the now deactivated feature bundle. Take the "dative" case forms in Classical Greek. They morphologically realize the dative, the locative (in most nouns), and the instrumental. In this situation, it is the dative case restriction that is deactivated. The feature bundles of the locative and instrumental are then repaired into that of the dative. The same occurs in the case of the "genitive" case forms in Classical Greek, which morphologically realize the genitive and the ablative. I assume that in this case the genitive case restriction is deactivated and a repair changes the ablative feature bundles into those of the genitive.

Observe that I am hypothesizing that the repair operations trigger feature changes in the terminal nodes and are not the result of impoverishment, which is the only operation that has been recognized as operating on feature specifications in Distributed Morphology (Halle and Marantz 1993; Noyer 1998;

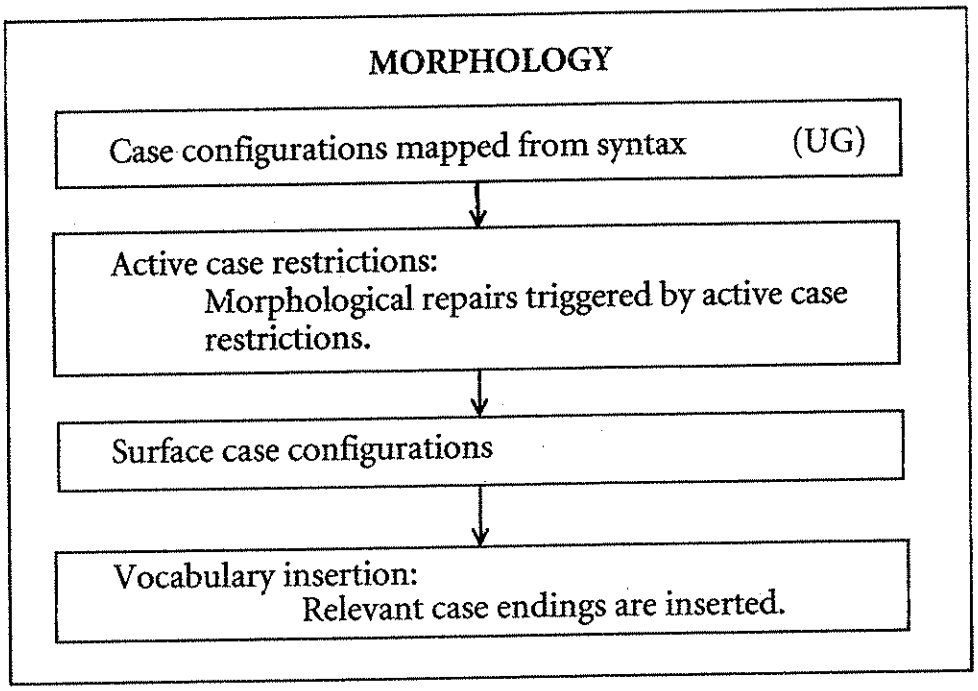
[16] The historical development leading to an absolute syncretism is obviously due to the activation of a deactivated case restriction and the subsequent adjustment of the feature bundles of the morphosyntax by a repair rule. As a consequence the vocabulary item characterized by the disallowed configurations can no longer be inserted. Instead, the vocabulary item characterized by the configuration that is the output of the repair rule is inserted. Thus the exponent identified by the disallowed feature configuration is eliminated and replaced by the exponent of the allowed configuration. The relevant morphological contrast is therefore eliminated.

[17] See Calabrese (2005) for a systematic theory of markedness constraints and repair operations in phonology.

Bobalijk 2001). Impoverishment can only account for why a given vocabulary item is not inserted in a certain terminal node, but cannot account for why a case is replaced by another case across vocabulary items regardless of their exponence and their feature specifications. This is what happens in the case of absolute syncretism. Hence impoverishment cannot be used to account for this phenomenon. It can deal only with the distribution of exponents and in particular with the retreat from a more specified exponent to a less specified one. This is not what we observe in the case of absolute syncretism. Take the syncretism between the genitive and the ablative in Classical Greek. By removing a feature from the feature bundle of the ablative–as required by impoverishment–we cannot get the fact that genitive case forms, regardless of their exponence, must be systematically used for this case. What we should expect instead are default or unspecified forms such as /*-s*/, not the exponent /*-io*/ of the genitive. Impoverishment governs only vocabulary insertion; changes of a case into another are beyond its reach. Impoverishment plays a role only in contextual syncretism and its function is that of preventing the insertion of existing vocabulary items.

Let us consider how syncretic processes occur. First of all, syntactic grammatical relations and thematic rules are mapped into case features bundles in the morphology, as proposed above. However, active case restrictions will filter out those illicit feature combinations of cases that do not have an idiosyncratic suffixal exponent. Repair operations triggered by these active restrictions change the disallowed feature bundle into allowed ones. A diagrammatic representation of how this occurs is provided below.

(6.46)



Consider what happens in the case of the ablative in Latin. The so-called "ablative" case forms of Latin morphologically realize the ablative, the locative, and the instrumental. I assumed that the Ablative is the least marked of the three; therefore, the case restriction governing the ablative is deactivated synchronically in Latin. The other feature bundles must then be converted into the feature bundle of the ablative by repairs.

Let us consider what happens in the case of the instrumental. A syntactic "instrumental" configuration is mapped into the case configuration in (6.47):

(6.47) *Instrumental*
+peripheral
−source
+location
+motion

However, the morphological component of this language contains the active case restriction in (6.48):

(6.48) *[+location, −source]/ [___, +motion]

This active restriction triggers the repairing feature change in (6.49a.):[18]

(6.49) a. [−source] → [+source]/ [_____, +location, +motion]

The operation in (6.49a.) changes the feature bundle of the instrumental into that of the ablative as in (6.49b.):

(6.49) b.

Instrumental	→	*Ablative*
+peripheral		+peripheral
−source		+source
+location		+location
+motion		+motion

The case feature bundle that is the outcome of the change in (6.49b.) is that of the ablative. Thus, by feature change, the instrumental case mapped from the syntax is replaced by the ablative in the morphological component. This is a

[18] As proposed in Calabrese (2005), feature change operations are obtained by deletion of the relevant feature followed by automatic insertion of the same feature with an opposite value. This insertion is required by a principle enforcing fully specified representations.

Impoverishment is also an operation of deletion and one can wonder if the operation of deletion behind (6.49) is also "impoverishment". In my view, despite their apparent formal similarity, this operation of deletion and the operation of impoverishment are quite different. Impoverishment as used in Distributed Morphology (see section 6.3.2) leaves morphosyntactic representations underspecified. Only in this way can it block vocabulary insertion (but see note 9 for a different formulation of impoverishment). In contrast, after the application of the deletion operation behind (6.49), morphosyntactic representations must be specified again. This results in a feature change operation.

case of absolute syncretism. The operations leading to the feature systems in (6.32) are due to repairs like this (see below for discussion).

One could propose that activation of case restrictions such as (6.48) and repairs such as (6.49), i.e., cases of absolute syncretisms, are only diachronic phenomena or adjustments occurring in the process of learning a language. In this case they would not have an active role in the synchrony of a grammar. However, I would like to propose that they do. Consider the Latin locative phrases in (6.16) again. I repeat them in (6.50).

(6.50) *meae domî (Pl. Au 432)* 'at my home' *villā meā* 'at my villa'
domî suae *(Cic. N.D. 381)* 'at his home' *urbe copiosā* 'in a wealthy town'
proximae viciniae habitat (Pl. Ba 205–6)
'he lives very close'

As discussed above, in the phrases in the right column, the case of the head noun is ablative. In those of the left column, the case is a genitive/dative "locative". The issue is that the grammatical, thematic and semantic functions of the phrases in (6.50) are identical; we are dealing with "locatives". If the different case forms we see on the head noun were just the outcome of contextual syncretism, that is, due to the different distributional properties of the vocabulary items, we should expect an identical case form on the adjective (see discussion above in section 6.2). As already observed, this is not what we find. The case forms of the adjective are different: genitive/dative in the left column, ablative in the right one. This indicates that the distribution of vocabulary items (i.e., contextual syncretism) does not play any role here. We are instead dealing with absolute syncretism, in particular synchronic absolute syncretism, an operation changing the feature bundle of one case into another one.

I propose that the most adequate analysis is the following. First of all, I assume that a syntactic locational phrase is mapped into a "locative" feature bundle. This feature bundle is disallowed by the active case restriction in (6.51).

(6.51) *[+location, −source]/[___, −motion]

This active restriction leads to the repairs in the feature bundles of the terminal nodes of the locative in the morphosyntax. The first repair occurs in singular nouns of towns and small islands and changes the locative into a dative; the other–most general–repair occurs in all other nouns and changes the locative into the ablative.

A problem that must be solved is that this analysis requires access to the lexical properties of the head nouns–one must know whether or not they are names of towns and small islands–before the insertion of the case exponent. To solve this problem I have to assume a cyclic model in which modifications

of the feature bundles of the terminal nodes in outer morphological cycles occur after vocabulary insertion in the inner cycles (see Bobaljik 2000). In this way the idiosyncratic morphological properties of nouns of towns and small islands can be made available for the repairs. The repairs triggered by (6.51) are given in (6.52)–(6.53).

(6.52) a. [+location] → [−location]/[___, −source, −plural] X +__ where X = a name of a town or a small (island.

b.

Locative	→	*Dative*
+peripheral		+peripheral
−source		−source
+location		−location
−motion		+motion[19]

Otherwise:

(6.53) a. [−source] → [+source]/ [___ +location]

b.

Locative	→	*Ablative*
+peripheral		+peripheral
−source		+source
+location		+location
−motion		+motion[20]

Observe that the absolute syncretism in (6.52) is characteristic of Classical Greek. (6.53) is obviously the common case in Latin.[21] An account of the changes we see in Latin locational phrases can thus be achieved.

To conclude I will consider the absolute syncretisms we observe in Classical Greek and in Old French. A schematic account of the changes accounting for the absolute syncretisms of Classical Greek are given in (6.54)).

[19] In most of the cases discussed below there must be some further adjustments in feature specifications. They mostly involve the feature [motion]. This feature is contrastive only in the Nominative/Accusative and Locative/Instrumental, otherwise its value is predictable from the other feature specifications in the feature bundle. The following repairs account for its distribution:

(i) [asource, alocation]→[+motion]/ [___, +peripheral]
(ii) [4−source, −location]→[−motion]]/ [___,+peripheral]
(iii) [+source]→[+motion]]/ [___, −peripheral]

It is the rule in (i) that applies in (6.52b) and changes the original feature specification [- motion] of the Locative into the feature specification [+motion] of the Dative, The status of these adjustments is unclear to me at this point They could indicate that the feature [motion] is problematic and needs to be changed; however, it works well in identify at this point. Further research is needed.

[20] The change of [−motion] to [+motion] in (6.53) is due to (i) of footnote 19.

[21] The following reconstruction for the situation we observe in Latin can be proposed: the locative case was a short /i/(cf. Watkins 1993 for Indo-European). This /-i/ was preserved in the case of nouns of towns and small islands. In contrast the locative was replaced by the ablative in the case of all other nouns. I propose that the short /i/ of the special local nouns was merged with the long /i:/ of the genitive–dative and that in this case the underlying case was reinterpreted as being genitive–dative. This led to the system that we observe in Latin.

(6.54) Active case restrictions in Classical Greek:[22]

a. i. *Instrumental: *[−source, +location]/[_____, +motion]

ii. Repair:
[+location] → [−location]/[_____, −source, +motion]

iii.

Instrumental →	*Dative*
+peripheral	+peripheral
−source	−source
+location	−location
+motion	+motion

b. i. *Ablative: *[+location, +source]

ii. Repair:
[+location] → [−location]/ [_____, +source]

iii.

Ablative →	*Genitive*
+peripheral	+peripheral
+source	+source
+location	−location
+motion	−motion

c. i. *Locative: *[+location, −source]

ii. Repair:
[+location] → [−location]/[___, −source]

iii.

Locative →	b. *Dative*
+peripheral	+peripheral
−source	−source
+location	−location
−motion	+motion

Accounting for what happens in Old French is not so straightforward. In Calabrese (1998) I proposed a detailed analysis of the different diachronic steps that led to this system. I cannot discuss this analysis here and refer the interested reader to that work. However, to assume that all these historical syncretic steps are still active in Old French would lead to a quite cumbersome analysis. I therefore propose that the best way to account for the Old French system is to hypothesize that the genitive case restriction is active in this language. (6.55a.) triggers the repair in (6.55b.):

(6.55) a. *Genitive: *[+peripheral]
b. Repair: [+peripheral] → [−peripheral]

[22] The change in feature motion in (6.54b iii) is due to (11) of Note 19; that in (6.54c iii) to (i) of Note 19.

The adjustments in (6.57) are then needed to remove configurations disallowed by the constraints in (6.56). They transform all of the non-nominative cases into the accusative as shown in (6.58):[23]

(6.56) i. *[−peripheral, +source]
ii. *[−peripheral, +location]

(6.57) i. [−peripheral] → [−source]
ii. [−peripheral] → [−location]

(6.58)

Input:	Nom.	Acc.	Gen.	Dat.	Loc.	Abl.	Inst.
Peripheral	−	−	+	+	+	+	+
Source	−	−	+	−	−	+	−
Location	−	−	−	−	+	+	+
Motion	−	+	−	+	−	+	+

(by 6.55b.):	Nom.	Acc.	Gen.	Dat.	Loc.	Abl.	Inst.
Peripheral	−	−	−	−	−	−	−
Source	−	−	+	−	−	+	−
Location	−	−	−	−	+	+	+
Motion	−	+	+[24]	+	−	+	+

(by 6.57):	Nom.	Acc.	Gen.	Dat.	Loc.	Abl.	Inst.
Peripheral	−	−	−	−	−	−	−
Source	−	−	−	−	−	−	−
Location	−	−	−	−	−	−	−
Motion	−	+	+	+	+	+	+

6.3.5 *The evolution of the Latin case system*

Evidence for hypothesizing that feature changes are needed to account for absolute syncretism is provided by historical changes implementing this type of syncretism. The case system of Latin underwent major changes in Late Latin. As discussed in Calabrese (1998) one of these changes was the widespread syncretism between the genitive and the dative.

[23] The change in the feature [motion] is due to rule (iii) of note 19 Therefore, I am predicting that in an ergative system, the genitive may become ergative once (6.55b.) applies. This appears to be correct (see Blake 1994: 122). A closer investigation of this issue is needed, something that I cannot do at present.

[24] All of the case restrictions in (6.43) are active with the exception of those against the accusative and the nominative. To obtain the correct result the active case restriction against the locative must trigger a repair changing this case into either the dative or the ablative so that it will obtain the feature [+motion].

Characteristically it was the genitive that replaced the dative, as we can see in (6.59):[25]

(6.59) *quod vinclum, quaeso, deest nostrae coniunctionis* (instead of *nostrae coniunctionii*) (Cic. ad Fam. v, 15, 2)
'What bond, I ask, is absent from our relationship?'
ille tunc imber... mortem intulit corporum (instead of *corporibus*)
(Chrisost. Ho. 7, 7)
'...the rain brought death to their bodies'
qui eorum (instead of *eis*) *auxiliare presumpserat* (Fredeg., sec. VI or VIII, 3, 51)
'he who had taken help to them'
viriliter eorum (instead of *eis*) *resistens* (Chronicum Salernitanum, 747–974)
'... resisting courageously to them'

We have seen the fundamental role that impoverishment and replacement by a less specified vocabulary item plays in the account of contextual syncretism. We could then try to extend the same type of analysis to the cases of absolute

[25] Two other important changes cannot be discussed here: one is the appearance of the accusative after prepositions that took the ablative in the classical language. This is illustrated in (i):

(i) cum:
cum filios suos tres (CIL, VIII, 3933) 'with his three children'
(instead of *filiis suis tribus*)
ab:
posita a fratres (CIL, VIII, 20296) 'put by the brothers'
(instead of *fratribus*)
pro:
pro se et suos (CIL, XII, 1185) 'for himself and his'
(instead of *se et suis*)

In the other, all prepositionless case-marked NPs were replaced with prepositional constructions as shown in (ii):

(ii) *ad carnuficem dabo* in place of *carnufici dabo*
'I will give ___ to the executioner'
dixit Iesus ad discipulos *dixit Iesus discipulis*
'Jesus said to the disciples'
ostentare ad digitum *ostentare digito*
'to indicate with the finger'
monasterium de castas (Theodosius De situ terrae sanctae)
'monastery of young girls'
in hoc tempore *hoc tempore*
'at this time'

As discussed in Calabrese (1998), these two changes are not due to feature change, the type of repair operation which is used in the text, but to a different type of repair operation, fission, and to a consequent change in the status of prepositions in morphosyntactic representations of Late Latin. Discussion of these changes would take too long and I am forced to refer the reader to Calabrese (1998) for an analysis of them.

syncretism we saw above. Specifically, we could hypothesize that the feature bundles of the cases that are eliminated are impoverished so that the relevant vocabulary items can no longer be inserted. Less specified vocabulary items would then be inserted.

Given what was proposed earlier, the ending /-s/ has a special status in Latin being the elsewhere case, the least marked vocabulary item. If we assume that syncretic changes are due to impoverishment of features in terminal nodes, we should expect this ending to play a crucial role in the development of the system and we should then expect the ending /-s/ to be extended to uses that it did not have before. For example, it should have become the exponent of the genitive of the second declension or of the dative, or of the genitive plural. No such change is attested or can be reconstructed in the history of the Romance nominal system.

The changes that we observe in this case do not involve exponents but the actual cases. Thus, we have syncretic changes between genitive and dative, regardless of the exponents that they have. For example, the genitive plural /-*ōrum*/ replaces the dative plural /-*īs*/ in the second declension, regardless of the internal constituency and featural assignments of these exponents.

The evolution of the Latin case system seems to operate only through operations on case feature bundles, regardless of the exponents realizing these case features. The best way of representing these changes is therefore by modifications in the morphosyntactic component, that is, through the activation of case restrictions and subsequent featural repairs. I hypothesize that this is one of the major ways in which case systems evolve.

6.3.6 *Absolute syncretism is not obtained by phonological changes*

A widely held explanation of the loss of the case system in a language argues that it is due to the phonological developments that this language underwent (see Blake 1994: 177–82, for example). In the case of Latin, the sound changes in (6.60) could have affected the case system. By these changes, the case distinctions in (6.61) can be phonologically neutralized.

(6.60) a. Loss of /m/ in word final position.

b. Merging of short /*ĭ, ŭ*/ with /long / *ē, ō*/.

c. Loss of quantity (Thus, R*omă*(nom.) can no longer be distinguished from R*omā* (abl.)).

(6.61)

NOM	ACC	ABL		
terra	*terram*	*terrā*	→ *terra*	*'earth'*
campus	*campum*	*campō*	→ *campo*	*'field'*
panis	*panem*	*pane*	→ *pane*	*'bread'*

However, a purely phonological explanation of the loss of the case system in Latin does not work. First of all, observe that the system of inflectional endings in verbs was not lost, although these endings were affected by the changes in (6.60) in the same way as the nominal ones. Furthermore, given the changes in (6.60) in a language like Spanish where final vowels and final /s/ were preserved, all the case distinctions in the plural should have been maintained, as we can see in (6.62). If they were lost, it must have been because of some non-phonological reason.

(6.62) Latin:

Plural				
Nominative	Genitive	Dative/Ablative	Accusative	
terrae	*terrarum*	*terrîs*	*terrās*	*'earth'*
campi	*camporum*	*campîs*	*campōs*	*'field'*

(6.63) **terre *terraro *terris *terras*
**campi *camporo *campis *campos*

The same is true for the genitives and datives characterized by a long /-ī/ in languages like Italian where final vowels were preserved.

In Old French, where low vowels were raised but not lost in word-final position, in contrast with non-low vowels that were lost, we should find an alternation between /Ø~e/ to realize a genitive–dative of the Romanian type, as in (6.64):

(6.64) *rose* < Lat. ROSA and ROSAM *'rose'*
**ros* < Lat. ROSAE/ROSE

The absence of this case contrast in Old French, as well as the other arguments mentioned above, demonstrates that a purely phonological account of the evolution of the Latin case system is not satisfactory (see Renzi 1993 for more discussion of these points).

Finally it is important to point out that phonological changes similar to those that occurred in the development from Latin to Romance also affected the Slavic languages. Thus, we have loss of coda consonants (e.g., Proto-Slavic **greb-tēi, *greb-ām, *grēb-s-am* > Common Slavic *greti, grebǫ, grěsŭ*) and lowering and surface disappearance of the short high vowels (e.g., Proto-Slavic **dĭn-ĭ-x, *sŭp-na-x* > Common Slavic **dĭn-ĭ, *sŭnŭ* > Russian *den', son*). Despite these changes, the original case system of Proto-Slavic is fully preserved in most of the Slavic languages. The six cases system of reconstructed Proto-Slavic (see the /-o-/ declension in (6.65)) is still present in Russian, after more than two thousand years, despite the radical changes in the phonological exponents of the different cases. This clearly indicates that syncretic changes are not due to modifications in the phonological shape of exponents even

if they can lead to phonological neutralizations between exponents. If case restrictions remain deactivated, then readjustments in the morphological system will restore the morphological contrasts.

(6.65)

	Proto-Slavic /-o-/ declension:		Russian /-o-/ declension:	
SING.				
N.	**stal-a-x*	'table'	*stol*	'table'
G.	**stal-a-at*		*stol-á*	
D.	**stal-u?*		*stol-ú*	
A.	**stal-a-m*		*stol*	
L.	**stal-a-i*		*stol-é*	
Ins.	**stal-ā*		*stol-am*	
DUAL				
N.-A	**stal-ā*			
G.-L.	**stal-au*			
D.-Ins.	**stal-a-mā*			
PLU.				
N.	**stal-ai*		*stol-i*	
G.	**stal-am*		*stol-ov*	
D.	**stal-a-max*		*stol-a-m*	
A.	**stal-ans*		*stol-i*	
L.	**stal-ai-xu*		*stol-a-x*	
Ins.	**stal-*(?)		*stol-a-mi*	

6.4 A model without restrictions and repairs

Finally, I deal with another possible way of accounting for the morphological realization of case in a language. In this approach, the morphological realization of case is accounted for by determining the feature specifications of the vocabulary items and by resorting to operations–such as impoverishment–that control the distribution of these items in the system. The feature combinations of the terminal nodes are free. Only the morphological exponence is limited. Therefore, all of the case feature combinations mapped from the syntax must be taken into consideration during vocabulary insertion and the feature assignments of vocabulary items must be established by considering all of them. All possible cases are present in morphosyntactic representations. Therefore, we have to say that the morphology of Latin includes the locative, the instrumental, the comitative, the purposive, all of the locational cases such as the elative, translative, and so on. This model, thus, does not recognize the existence of absolute syncretism, only of contextual syncretism. Variations in the morphological realization of a given case can be accounted for

only by referring to the feature specification of the vocabulary items and to impoverishment.

A first problem for this approach arises in situations in which there could be a contradiction between a vocabulary item that is elsewhere because of its pattern of contextual syncretism and a vocabulary item that is elsewhere because it is the sole exponent of different cases, that is, because it enters a situation of absolute syncretism according to the model outlined in the previous sections.

For example, consider Old French in (6.1). The exponent /Ø/ represents all non-nominative cases in the singular. Given the feature system in (6.20), there is no common feature in all of these cases. Therefore /-Ø/ should be an elsewhere item. But /s/ has a wider distribution in the system because of its pattern of contextual syncretism. According to this criterion, /s/ should be the elsewhere item. Hence we have a problem to solve.

The solution involves selecting an adequate set of features. For example, we can introduce a new feature, say [oblique]. All non-nominative cases would be [+oblique]; so Old French /Ø/ could be assigned the feature [+oblique, −plural]; /s/ remains the elsewhere item. This is shown in (6.66):

(6.66) Ø ↔ [+oblique, −plural]
s ↔ [Ø]

Given that /-Ø/ is [+oblique], it can be inserted in the feature bundles of all cases, with the exception of the nominative, without any problem.

The selection of an adequate set of features is fundamental in this model. Here I explore one such feature system. Let us suppose that cases are organized in a hierarchical structure such as that in (6.67). In (6.67), each case, with exception of the nominative, which contains only negative feature specifications, is obtained by adding a positive feature specification to the feature bundle of the case on its left: in the instrumental [+means] is added, in the ablative [+origin] is added and so on. The features here are just classificatory devices and self-explanatory).[26]

(6.67)

	N	A	G	D	L	Abl.	I
Oblique	−	+	+	+	+	+	+
Peripheral	−	−	+	+	+	+	+
Inherent	−	−	−	+	+	+	+
Location	−	−	−	−	+	+	+
Origin	−	−	−	−	−	+	+
Means	−	−	−	−	−	−	+

[26] Here I am again assuming that morphosyntactic representations are fully specified and my arguments here use fully specified representations. However, as the reader can try by him/herself, the same arguments would hold if one were to adopt underspecified morphosyntactic representations.

In this approach, each vocabulary item is assigned this feature: thus an instrumental form would be [+means], an ablative form [+source] and so on. The nominative is [−oblique]. The feature assignments of the different case exponents in a hypothetical system without syncretism would be as in (6.68):

(6.68) $\alpha_{\text{Nom.}} \leftrightarrow$ [−oblique]
$\beta_{\text{Acc.}} \leftrightarrow$ [+oblique]
$\gamma_{\text{Gen.}} \leftrightarrow$ [+peripheral]
$\delta_{\text{Dat.}} \leftrightarrow$ [+inherent]
$\varepsilon_{\text{Loc.}} \leftrightarrow$ [+location]
$\eta_{\text{Abl.}} \leftrightarrow$ [+source]
$\zeta_{\text{Inst.}} \leftrightarrow$ [+means]

One could now propose that syncretism involves simple loss of a vocabulary item. If this occurs, the vocabulary item of an adjacent feature bundle in (6.67) would be inserted in the terminal node of the lost item. For example, given (6.68), if the vocabulary item of the instrumental is lost, the vocabulary item of the ablative would be inserted in the terminal node of the instrumental since this terminal node also contains the feature [+source]. This solution complicates the feature system but simplifies the morphology that does not need to have feature-changing operations like those used in section 6.3.4.2.

In (6.67) for each case there is a feature. However, there are syncretic relationships that require the introduction of new features. Let us look back at the singular of the Classical Greek /o-/ declension. It is repeated in (6.69):

(6.69) SING.

N.	*ἀδελφος*	(<*adelph -o-s*)	'brother'
G.	*ἀδελφου*	(<*adelph -o-io*)	
D.	*ἀδελφῳ*	(<*adelph -o-i*) (+thematic vowel lengthening and laxing)	
A.	*ἀδελφον*	(<*adelph -o-n*)	

In Classical Greek there is absolute syncretism between the genitive and the ablative, and between the dative, the locative, and the instrumental. In this model, when a speaker is faced with accounting for the distribution of the vocabulary items, he/she must also consider the cases that are not morphologically realized in the system, in addition to those that are morphologically realized in it. Therefore, what we call the genitive in (6.66) is actually a genitive–ablative in the sense that the exponent of this vocabulary item must be inserted in the feature bundles of the genitive, as well as of the

ablative. In the same way, what we call a dative is actually a dative–locative–instrumental.

Now observe that assuming (6.67) there is no feature set or subset ordering that can account for the distribution of the items. The feature system in (6.67) fails to account for Classical Greek. The correct result is achieved by adding a further feature to (6.67) where there is a common feature specification between the genitive and the ablative and hypothesizing the feature system in (6.70). The appropriate vocabulary items for Classical Greek are given in (6.71):

(6.70)

	N	A	G	D	L	Abl.	I
Oblique	−	+	+	+	+	+	+
Peripheral	−	−	+	+	+	+	+
Inherent	−	−	−	+	+	+	+
Location	−	−	−	−	+	+	+
Origin	−	−	−	−	−	+	+
Means	−	−	−	−	−	−	+
Source	−	−	+	−	−	+	−

(6.71) Classical Greek:

g. /*-i*/ ↔ [+peripheral, −source] (D/L/I Sg)
h. /*-n*/ ↔ [+oblique, −peripheral] (AccSg)
i. /*-io*/ ↔ [+source] (G/AbSg)
j. /*-s*/ ↔ Ø (NSg)

One of the problems of this model is thus that it requires a quite complex set of features. This becomes obvious when we start considering other cases such as the different locational cases, the comitative, the purposive, the ergative, and so on. For each of these cases, we will need a new feature. This obviously leads to a sizable expansion of the feature system in (6.70).

However, the most fundamental problem for this approach is another one. As mentioned above, in this model, there are only the feature bundles of the morphosyntax, the vocabulary items, and the operation of impoverishment.[27] Therefore, there is no way of dealing with absolute syncretism. This leads to various failures.

First of all, we know that there are syncretic operations that operate across vocabulary items. Thus, in section 6.3.5 where we considered the evolution of the Latin case system, we have seen that when a case is replaced

[27] I omit discussion of operations such as fission that do not play a role in syncretic processes.

by another case in the history of a language, this occurs across declension classes regardless of the different exponents of the cases. The exponents that represent the case in the different declension classes are simply replaced by the different exponents of the other case. This is an instance of what I called absolute syncretism. Now this model is able to account only for changes in the distribution of single lexical items, but not of classes of lexical items as it happens in the case of absolute syncretism. Therefore, this model fails to deal with across-the-board case replacements.

Secondly, this model cannot deal with what we observe in the case of the Latin locative in which we found a case form that was syncretic to that of genitive/datives in singular nouns of towns and small islands and another one that was syncretic to ablatives elsewhere. In fact, in this model variations in the morphological realization of a given case, as are those seen in the Latin locative, can be accounted for only by referring to the feature specifications of the vocabulary items and to impoverishment. Therefore, we must say that in Latin there is contextual syncretism between locative and the genitive/dative in singular nouns of towns and small islands (in addition to *rūrī* and *domī*). In all other nouns, instead, there would be contextual syncretism between the locative and the ablative. We have already seen that this leads to problems. Here I will try to see if we can find a better solution in this model.

Formally, the following analysis could be proposed: in the mapping from syntax, the features of the locative case are assigned to locational phrases. This locative case is preserved throughout the morphology in the relevant terminal node of the morphosyntax, and the appropriate vocabulary items must be inserted in this terminal node.

We have to decide which is the basic vocabulary item for the locative. There are two possibilities: 1) /Ø/ which is syncretic with the ablative (plus the relevant readjustments); 2) /*i*ː/ which is syncretic with the genitive/dative. The basic item to select should be the most specified one of the two. The insertion of other one would be accounted for by impoverishment. The first possibility is easy to reject. The distribution of the exponent /Ø/ is less restricted than that of /*i*ː/, therefore it must be less specified than /*i*ː/. We then select /*i*ː/. Now, we have to decide if this exponent is the same as that of the genitive/dative or a different one, and accept two different homonymous /*i*ː/ in the singular, in addition to the other one in the plural. If we assume that the /*i*ː/ we see in the locative is identical to the other one found in the genitive/dative, we need a new feature common to these three cases. I would prefer not to complicate the case feature system in (6.70) further, and instead propose that there is a high degree of homonymy among Latin case exponents. The list of the case

vocabulary items in Latin would be that in (6.72). (The feature system used is that in (6.70).)

(6.72)

a.	*/-um/*	↔	[+peripheral, −inherent, +plural]	(GPl)
b.	*/-iː/*	↔	[−oblique, −peripheral, +plural]/ [−neut, I, II] +__	(NPl, I, II)
c.	*/iː/*	↔	[+peripheral, −location, −plural]	(G&DSg)
d.	*/iː/*	↔	[+location, −association, −plural]	(LSg)
e.	*/ə/*	↔	[−peripheral, +plural]/[+neuter]+___	(N&APl. Nt)
f.	*/−m/*	↔	[+oblique, −peripheral, −plural]	(ASg)
g.	*/-bu-/*	↔	[+inherent, +plural]/[III, IV, V] +__	(D&Ab, L, I, Pl. III–V)
h.	Ø	↔	[−plural]	(Sg default)
i.	*/s/*	↔	[Ø]	Elsewhere

To account for the appearance of /Ø/ with nouns that are not nouns of towns and small islands, we have to assume an operation of impoverishment such as that in (6.73). This operation accounts for the insertion of /Ø/ in the locative of most nouns.

(6.73) The feature [−association] is deleted in the environment [__+location] in nouns that are not names of towns and of small islands.

Assuming the vocabulary items in (6.72) and impoverishment we have an account of contextual syncretism in the Latin case endings.

An immediate problem for this analysis arises from the fact that the appearance of Ø is associated with the application of certain readjustment rules in the ablative (see section 6.3.2). Crucially these rules do not apply when the exponent */-iː/* occurs. Somehow we have to say that the operation of impoverishment must also affect the application of the readjustment rules. It is unclear to me how we can implement this.

However, a worse problem arises in this approach when we have to account for the morphological variations we see in concord between an adjective and a head noun in locational phrases. As we see in (6.74), a genitive/dative form appears in the adjective if the head noun has a form syncretic with the genitive/dative case, and an ablative form if the head noun has a form syncretic with the ablative case.

(6.74) *meae domî (Pl. Au 432)* 'at my home' *villā meā* 'at my villa'

In this model there is no way of manipulating the feature complexes of the terminal nodes to obtain changes in case identity. Therefore, we must assume that both the adjective and the noun of both phrases in (6.74) are characterized by the locative case. It follows that the variations in the morphological

realization of this case that we see in (6.74) must be due to manipulations of the feature specifications of the vocabulary items and to the operation of impoverishment, the only means that this model has to account for syncretic changes.

Now we know that that contextual syncretism patterns do not play a role in concord. In concord the lexical properties of the root noun such as declension class are not transmitted/copied onto the dependent adjective as shown again in (6.75):

(6.75) Genitive: *tristis puellae* 'of the sad girl'
Dative: *tristī puellae* 'to the sad girl'

The fact that, in the first declension class, the dative and the genitive have the same case exponent does not matter in the selection of the case exponent of the adjective. Concord looks only at grammatical properties such as case, gender, and number.

We also know that lexical properties triggering impoverishment cannot be transmitted from the head noun to the adjective. An impoverishment operation that applies in the head noun does not apply in the modifying adjective. We see this in (6.76).

(6.76) *bonī regis* 'of the good king'

The presence of /*-s*/ in the genitive *regis* indicates that impoverishment has applied. This property of the head noun, a characteristic feature of the third declension to which the word for king belongs, is not transmitted to the adjective *bonus* of the II declension which then shows up with /*-iː*/ in the genitive.

In the model just proposed to account for the case variation we observe in (6.74) we have to assume that an operation of impoverishment must also apply when the case exponent of the adjective is inserted. This means that a lexical property of the head noun must be copied or transmitted during concord. However, as shown above, the idiosyncratic properties of the head noun are not copied/transmitted in concord. Therefore we have to conclude that this analysis cannot be pursued. The model fails to account for what happens in (6.74). I put forth that to have an adequate analysis of what happens in the phrases in (6.74) one must distinguish between absolute and contextual syncretism, and I propose that in the case of locational phrases in Latin we are dealing with absolute syncretism: the underlying locative is changed into the ablative and locative as proposed in section 6.3.

The fact is that absolute and contextual syncretism must be recognized to exist. They are different phenomena. Contextual syncretism accounts for the

distribution of items with respect to other items realizing different specification of the same set of features. Contextual syncretism directly deals with the phonological aspects of these items. As such, it is the result of the historical interaction between the phonological and morphological properties of the vocabulary items. Absolute syncretism is much more abstract: a case is replaced by another case regardless of the vocabulary items that realize them. Being different phenomena, they must be treated independently, and not uniquely by manipulating the features of the lexical items. The model discussed in this section fails to do that.

6.5 Conclusions

In this chapter I proposed that the structure of paradigms is accounted for by the constraints on feature combinations of the terminal nodes of the morphosyntax.

If this is correct, one could propose the following principle:

(6.77) An allowed feature combination of a language L must be morphologically realized in L at least once.

From (6.77) it follows that neutralization of phonological contrast does not lead to neutralization of morphological contrasts. Thus, if we have a phonological neutralization between exponents in a paradigm, but the relevant morphological contrast is maintained–that is, if the relevant morphological marking statement is not activated–the morphological contrast will be realized by other phonological means. This is what occurred in the Slavic languages.

Given the paradigmatic structure established by (6.77), the feature assignment of vocabulary items accounts for the distribution of exponents in the structure and for the contextual syncretism we observe in it. Both synchronic and diachronic absolute syncretism would instead require changes of the feature assignments of the terminal nodes of the morphosyntax.

Appendix: Case features

In this section I provide motivation for the case feature system I use in the text. Behind all of the assumptions of this chapter is the idea that case syncretisms, both contextual and absolute ones, are not accidental or random, but follow precise generalizations. The goal of case features is to account for syncretic patterns.

I propose the feature system in (6.79). It was obtained in the following way. I decided to use the minimal number of features required to account

for the cases of contextual syncretism[28] we observe in Old French, Sanskrit, Classical Greek, and Latin. No less than four features must be used. I focused on the peripheral cases: the genitive, the dative, the locative, the ablative, and the instrumental. One observes the following contextual syncretism between these cases: a. between genitive and dative (cf. Latin); b. between dative and ablative (cf. Latin); c. between dative, ablative, and instrumental (cf. Sanskrit); d. between genitive and locative (cf. Sanskrit). I first freely assigned positive and negative specification of arbitrary labels such as Z, X, Y, W and then I tried to establish patterns of insertion. To insert the same exponent in the genitive and the dative, the feature bundles of these two cases must have some common feature specifications, at least two.[29] Subsequently I fine-tuned the feature assignments of the different cases, trying to account for the absolute syncretisms in the languages under consideration by changing the minimal number of feature specifications. The system that resulted is that in the non-shaded part of (6.78).[30] Starting from the non-shaded part I then tried to give a name to the arbitrary labels Z, X, Y, W by considering their possible meaning and function. At this point I tried to give appropriate specification for the nominative, accusative, and ergative (the shaded part of (6.78)), keeping in mind the contextual syncretism between nominative and accusative found in Latin neuters. This led to the system in (6.79). The different names have the following rationale: [Z] is [Peripheral]. [Z] is common to the genitive, dative, locative, ablative, and instrumental, which are often called the peripheral cases in contrast to the nominative and accusative, which are called the core cases. [Y] is [Location]. The positive specification of [Y] identifies the locative and the ablative, which are the locational cases. I also assigned it to the instrumental. [W] is [Motion]. A positive specification of [W] contrasts the dative, ablative, instrumental against the genitive, locative. I assumed that what is common to

[28] I considered only cases of syncretism involving features, that is, I disregarded all the cases of syncretism that can be accounted for by using an elsewhere or default exponent such as Latin /-s/ or /-Ø/.

[29] G–D = [+Z, – Y], G–L = [+Z, – W], D–Abl–Ins = [+Z, +W]. The feature X was required to distinguish the instrumental from the other peripheral cases. Its specifications are more arbitrary and in function of the name I later gave to this feature.

[30] There is some editing. To simplify the exposition, I reverted + and – specifications in function of the names I will later give; for example, the feature Y came first out with the assignments in (i):

(i)

	Gen.	Dat.	Loc.	Abl.	Inst.
Y	+	+	–	–	–

I reverted + and – as in (ii) when I decided to call it [Location]:

(ii)

	Gen.	Dat.	Loc.	Abl.	Inst.
Location	–	–	+	+	+

The same feature specification for the Abl. and the Inst. was required by the need to simplify the operation accounting for the absolute syncretism between these two cases.

these cases with respect to the locative is that their semantics involve motion (to or from). I extended this feature specification to the accusative and the ergative. Finally [X] is [Source]. I needed this feature to distinguish the instrumental [−X] from the ablative [+X]. I also assigned [+source] to the genitive, which is often syncretic with the ablative (see Classical Greek), and to the ergative.

(6.78)

	Erg.	Nom.	Acc.	Gen.	Dat.	Loc.	Abl.	Inst.
Z				+	+	+	+	+
X				+	−	−	+	−
Y				−	−	+	+	+
W				−	+	−	+	+

(6.79)

	Erg.	Nom.	Acc.	Gen.	Dat.	Loc.	Abl.	Inst.
Z (Peripheral)	−	−	−	+	+	+	+	+
X (Source)	+	−	−	+	−	−	+	−
Y (Location)	−	−	−	−	−	+	+	+
W (Motion)	+	−	+	+	+	−	+	+

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