Inheritance and Inflectional Morphology: Old High German, Latin, Early New High German, and Koine Greek

By

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Professor Gary Holland

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Abstract

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The inheritance framework originates in the field of artificial intelligence. It was incorporated first into theories of computational linguistics, and in the last two decades, it has been applied to theoretical linguistics. Inheritance refers to the sharing of properties: when a group of items have a common property, each item is said to inherit this property. The properties may be mapped in tree format with nodes arranged vertically. The most general (i.e. the most widely shared, unmarked) properties are found at the highest nodes, and the most specific (marked) information is found at the lowest nodes.

Inheritance is particularly useful when applied to inflectional morphology due to its focus on the generalizations within and across paradigms. As such, it serves as an alternative to traditional paradigms, which may simplify the translation process; and provides a visual representation of the structure of the language's morphology. Such a mapping also enables cross-linguistic morphological comparison.

In this dissertation, I apply the inheritance framework to the nominal inflectional morphology of Old High German, Latin, Early New High German, and Koine Greek. The corpus consists of parallel biblical passages in each language which will serve as the basis for comparison. The trees may be used as a translation aid to those reading these texts as an accompaniment to or substitute for traditional paradigms. Moreover, I aim to shed light on the structural similarities and differences between the four languages by means of the inheritance trees.

For Ellie

Table of Contents

Abbreviations and Symbols

abl	ablative
acc	accusative
AI	Artificial Intelligence
cons	consonantal
COR	coronal
dat	dative
decl	declension
DET	determiner
diph	diphthongal
ENHG	Early New High German
f	feminine
fem	feminine
gen	genitive
GEND	gender
HPSG	Head-Driven Phrase Structure Grammar
inf	infinitive
inst	instrumental
loc	locative
m	masculine
masc / mask	masculine
MHG	Middle High German
MM	Minimalist Morphology
N	(typical) noun
neut	neuter
NHG	New High German
nom / NOM	nominative
nonfem	nonfeminine
nonobl	nonoblique
NP	noun phrase
NUM	number
obl	oblique
p	plural
part	participle
PHON	phonological form
PIE	Proto-Indo-European
pl	plural
plu	plural
pres	present
pret	preterite
OHG	Old High German
S	sentence
sg	singular

subj	subjunctive
UML	umlaut
v	verb
voc	vocative
voc stems	vocalic stems
VP	verb phrase

¬	not
∧	and
∨	or
~~V~~	all cases
ø	none

Corpus Passages

Luke 1:1-4

John 1:1-5

Luke 1:5-80

Luke 2:1-7

John 4:4-42

John 12:20-36

Interpolated passage incorporating Matthew 27:27-32; Mark 15:17,20; John 19:2; and Luke 23:26-31

Matthew 6:9-13

Matthew 12:32-50

Matthew 13:1

Matthew 13:41-53

Matthew 28:16-20

Pages in respective sources:

Braune 1994: 24-27; 46-56 (OHG and Latin)

Luther 1522/2001: 208; 326; 208-16; 336-40; 378; 126/202/400/316; 32; 58-60; 64-66; 132 (ENHG)

Tregelles 1857-61: 217; 376; 217-25; 390-4; 442-4; 112-3/208-9/470-1/364-5; 16-17; 40-43; 47-49; 118 (Greek)

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Chapter 1
Introduction

Grammars of historical languages traditionally present inflectional morphology via paradigms listing all possible forms of the lexeme. Nominal paradigms are divided by case, number, and gender. Further, if required for the language in question, they are grouped by inflectional class. Such paradigms are familiar to those working with historical languages, and while grammars may focus on the lexical items in their entirety or only the suffixes, lists of grammatical forms are the norm. Grammars using other formats to present the data (alongside paradigms) include Rauch 2003, 2nd ed. 2011.

Approaches to morphological analysis in the last century have varied in their treatment of lexical items. They have dealt with discrete morphemes (item-and-arrangement approach), full lexical items (e.g. Optimality Theory), or, in an intermediate approach, changes to the lexeme (item-and-process, i.e. generative, approach). Each presents a different perspective on morphological structure: the item-and-arrangement approach deals with the patterns that emerge from the surface forms; the item-and-process approach considers changes to an underlying form in order to produce the surface form; and Optimality Theory deals with the constraints that produce the surface forms, the most favorable of the possible underlying forms.

In this dissertation, I will present an alternate means of morphological analysis: inheritance trees. This refers to the mapping of inflectional suffixes in tree format, organizing them as a series of nodes. The trees employ a minimalistic presentation of the data in which shared properties are listed only once on the tree, namely on a parent node, and are then inherited by its subnodes. This allows the tree to capture useful generalizations about the data. In order to most effectively generalize these properties, I will not treat the full lexical items, but only the inflectional endings. (Examples of full lexical items with the inflectional endings will be provided in the appendix; cf. p. 66.)

Inheritance has its roots in artificial intelligence (e.g. Etherington & Reiter 1983) and was applied first to computational linguistics. Initially, it was primarily used for semantic analysis (i.e. semantic nets, cf. Chapter 2). Early applications to linguistics include Head-Driven Phrase Structure Grammar (Pollard & Sag 1984), among others; subsequently, inheritance has been utilized in a variety of linguistic theories. In this dissertation, I aim to present the inheritance framework as a fruitful means of morphological description and analysis. In particular, I will focus on the generalizations that the trees reveal.

I will utilize inheritance trees to analyze the nominal inflectional morphology of four historical languages: Old High German (Chapter 3), Latin (Chapter 4), Early New High German (Chapter 5), and Koine Greek (Chapter 6). These languages represent two pairs of translated texts and thus form one basis for comparison. Finally, I will compare and contrast the morphology of these languages through the lens of inheritance in Chapter 7. I aim to shed light on the structure of the morphological inventory of each as well as on diachronic changes in German via the synchronic analysis of two stages of the language (Old as well as Early New

High German). Moreover, I aim to make this framework accessible to the language learner or translator as an alternative to the traditional paradigm format. Inheritance trees provide an alternate visual and cognitive representation of the data that is of benefit to the translator.

Chapter 2
State of the Research; Method

1. Inheritance

In the context of computational linguistics, inheritance refers to the sharing of properties by related items. These items can be organized in a tree diagram (inheritance tree) in which the most basic item, that is, one with the fewest properties, is placed at the top; items sharing the properties of the highest node (root node) and adding more specific information are placed below on subnodes. More subnodes can be added as needed, such that the least general items are found furthest from the root. As will be shown below, this method of organization has numerous applications, ranging from presentation of hierarchies of objects to the representation of morphology. The following example from Etherington & Reiter 1983:104 provides a straightforward example of inheritance:

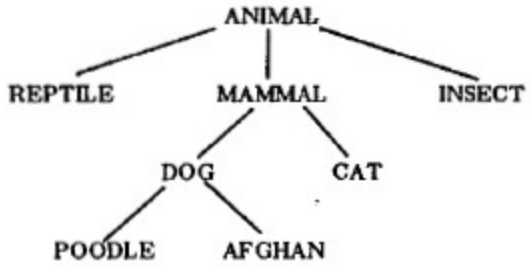

Fig. 2.1

In this hierarchy, each item is a member of the category of its parent node, e.g. a poodle is a member of the category DOG and a dog is a MAMMAL. Such statements specifying a lexical item's category membership are called IS-A relations. Without bringing specific properties into the discussion, one infers that a poodle possesses all of the properties that a dog has, plus some additional specific characteristics; and a dog shares all basic properties of mammals.

Daelemans et al. (1992) provide an overview of the concept of inheritance, including the different types that may be employed. The simplest is monotonic inheritance, in which each node has only one parent node and inherits all properties of the parent node. The authors illustrate monotonicity via the following network of English verbs (206):

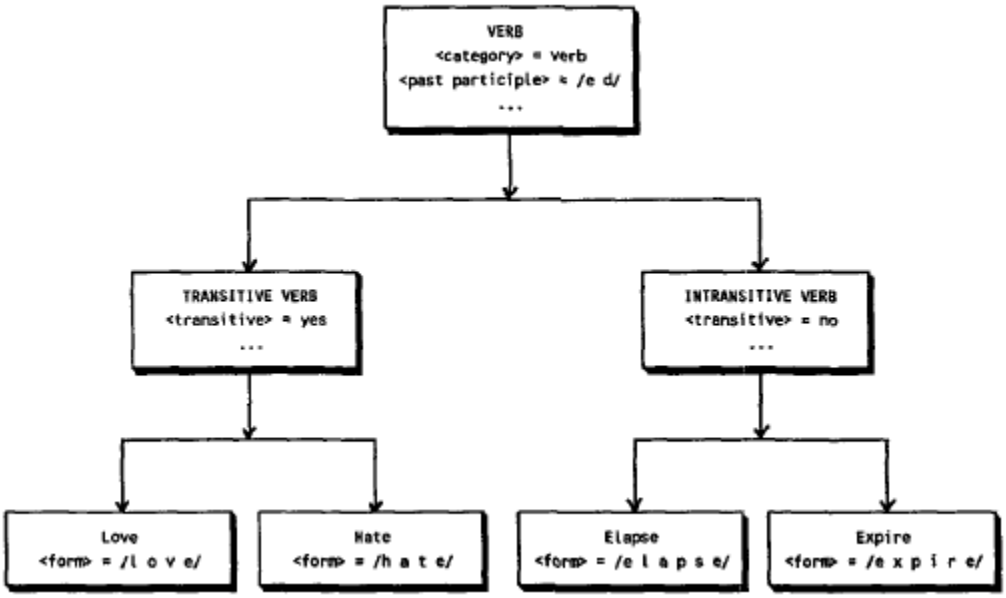

Fig. 2.2

Thus, the verb *love* has as its parent TRANSITIVE VERB: it inherits the transitive property as well as the properties associated with the root node VERB, namely a past participle in *-ed*. A monotonic network requires a set of properties that fit neatly into categories, which is rarely the case in a description of natural language. One alternative is to turn to multiple monotonic inheritance, which permits multiple parent nodes and thus allows for exceptions. The authors propose the following amendment to Fig. 2.2 to include such verbs as *beat* that have a past participle in *-en* (208):

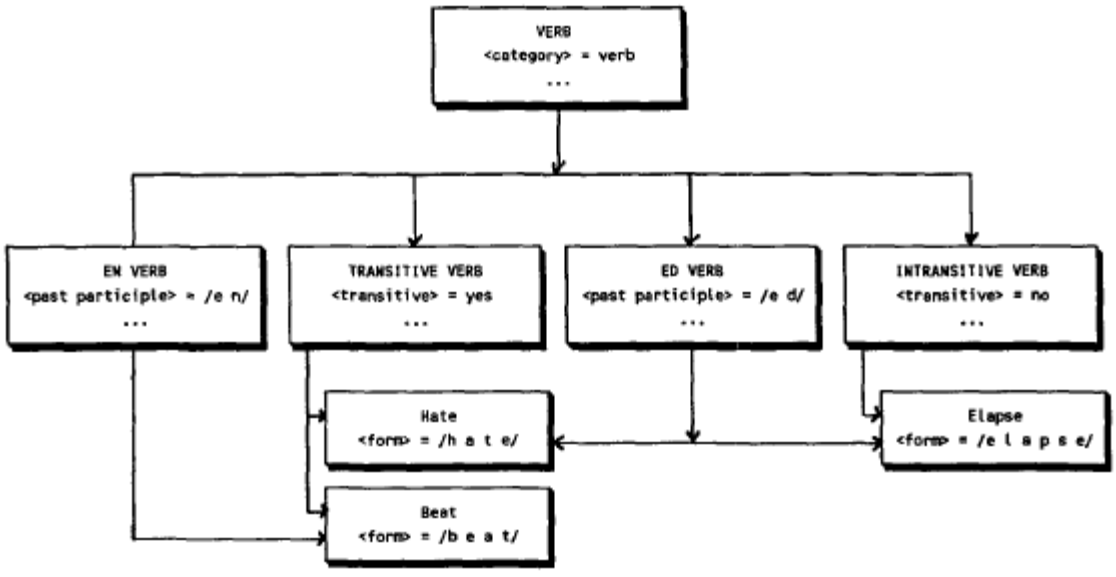

Fig. 2.3

Beat inherits transitivity from the TRANSITIVE node and its past participle form from the EN VERB node. Because there are no contradictory properties specified on those two nodes – e.g. EN VERB does not specify intransitivity – this is a viable option. However, contradictory information is a potential issue in other cases. Alternatively, one may include exceptions by permitting information specified on subnodes to override information that would otherwise be inherited. This creates a nonmonotonic, or default, inheritance network. Fig. 2.4 below reformulates the information from Fig. 2.3 (208):

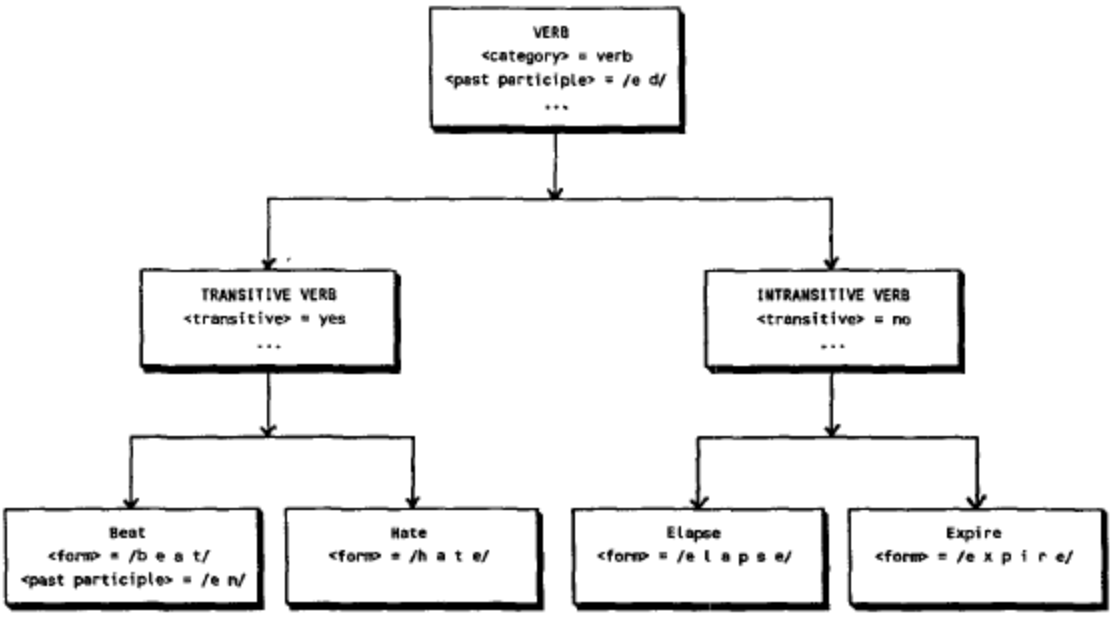

Fig. 2.4

In the above tree, the authors classify the verbs according to transitivity. Within each category, the past participle suffix *-ed* specified on the root node is assumed; the verb *beat*, which does not follow this model, has its participial suffix *-en* specified at the lexical level (i.e. the lowest node). The other three verbs listed, namely the transitive verb *hate* and the intransitive verbs *elapse* and *expire*, do not have a past participle suffix listed, and are accordingly assumed to inherit the default suffix *-ed*. This format lends itself well to the description of natural languages, as it permits both useful generalizations and the inevitable exceptions to these. For this reason, I have elected to employ the default inheritance model in my analysis below.

Daelemans et al. (1992:209) also provide a useful overview of the literature on inheritance. They trace its origins to

> three rather separate traditions. The first is that of 'semantic nets' in AI, which goes back to Quillian (1968) through Fahlman's (1979) NETL to the late 1980s monographs by Touretzky (1986) and Etherington (1988). The second is that of data abstraction in programming languages, which has led to (a) object-orientation[1] in computer science

[1] Cf. Meyer 1997 for an in-depth explanation.

> with its notions of classes and inheritance as embodied in such languages as Smalltalk, Simula, Flavors, CLOS and C++, and (b) the use of type hierarchies, which have become widely seen in unification-oriented NLP[2] since the appearance of Aït-Kaci (1984) and Cardelli (1984).... The third is the notion of 'markedness' in linguistics, which originates in the Prague School phonology of the 1930s, reappears in the 'generative phonology' of Chomsky and Halle (1968) and Hetzron's (1975) and Jackendoff's (1975) models of the lexicon.... Unlike the other three traditions, the linguistic tradition does not embody a notion of inheritance per se. But the issue of how to decide which operations take precedence over others has been a continuing concern in the literature.

Inheritance thus draws from diverse fields, principally artificial intelligence and knowledge representation, with influence from linguistics. In the following sections, I will look at its roots in artificial intelligence, review early applications of the concept to linguistics, and outline linguistic theories and formalisms that draw upon inheritance. Finally, I will discuss some theoretical issues relating to my methodology, namely the concept of the paradigm and how to deal with syncretism within it, and introduce the data to be analyzed.

1.1. Artificial Intelligence

The inheritance framework originated in the field of artificial intelligence (AI). Etherington and Reiter (1983:104) provide an early implementation of default inheritance to semantic networks. They begin with the existing inheritance framework, illustrating the concept with an inheritance tree which is "a taxonomy organized by the usual IS-A relation." This tree is provided in section 1 above (Fig. 2.1). In this example, no exceptions are permitted or introduced, e.g. there are no poodles that are not dogs. Next, the authors explore how exceptions can fit into this theory. This is best illustrated with another example, e.g. the following two statements (105):

(1) Elephants are gray, except for albino elephants.
(2) All albino elephants are elephants.

Statement (1) reflects the fact that one assumes an elephant to be gray unless otherwise specified. Albino elephants represent an exception, therefore the IS-A statement does not apply here; however, we can say that gray is the default color. Etherington and Reiter (ibid.) express defaults in the following format:

$$\frac{\alpha(x_1,\ldots,x_n) : \beta(x_1,\ldots,x_n)}{\gamma(x_1,\ldots,x_n)}$$

This is read as "for any individuals $x_1,\ldots, x_n$, if $\alpha(x_1,\ldots,x_n)$ is inferrable and $\beta(x_1,\ldots,x_n)$ can be consistently assumed, then infer $\gamma(x_1,\ldots,x_n)$" (Etherington & Reiter 1983:105). To illustrate with the elephant example (statement (1)), this is reflected as follows:

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[2] Cf. Daelemans et al. 1992:211 for further examples.

$$\frac{ELEPHANT(x) : GRAY(x) \,\&\, \neg\, ALBINO\text{-}ELEPHANT(x)}{GRAY(x)}$$

When the information ELEPHANT is given, GRAY and not ALBINO-ELEPHANT are both possible, so GRAY is to be inferred (and is thus the default). As the authors note (ibid.), if ALBINO-ELEPHANT were instead the given information, GRAY is inconsistent with its properties and the default is blocked. (Etherington & Reiter 1983:105) This default format provides an alternative to the stricter first-order formulae (i.e. IS-A statements). Etherington and Reiter do not, however, illustrate defaults in tree format. Their work provides a foundation for default inheritance trees, including those I will introduce in my data analysis (Chapters 3-6).

The use of defaults is criticized in Brachman's 1985 article. Coming from the field of knowledge representation, he discusses the use of default inheritance networks (here, semantic nets; cf. Etherington & Reiter 1983) in AI and, specifically, the shortcomings of this framework. As mentioned earlier, default inheritance permits cancellation of any property from a parent node at a subnode; according to Brachman, this is a serious flaw for the description of lexical items. Essentially, one relies on the prototype of a given lexical item (he uses the example of elephants), and from there, any property associated with the typical elephant may be canceled. For example, if a typical elephant is gray and has four legs and a trunk, how does one represent an elephant that is jaundiced, or has lost a leg or its trunk? How does it remain classified as an elephant if all of these properties may be negated? Moreover, he (83-4) raises the question of representation of universal properties, that is, those which permit no exceptions. In this manner, default inheritance prevents an accurate, thorough lexical description; he claims that it leaves the field of possible substitutions of properties too open, extending it to things that are not, for example, elephants. To give Brachman's example (85), a rock may be called an elephant, but without the trunk and legs.

While valid arguments against using this framework for lexical description, default inheritance does not introduce these limitations to inflectional morphology. Prototypical forms do play a role in the area of markedness (unmarked forms tend to be prototypical, and found at high nodes); however, the addition or amendment of information on subnodes does not alter the status of the unmarked form on the parent node. A different case or number is not an exception to a rule, but an alternative. Since no definition is involved, Brachman's particular cases do not apply; here, exceptions do occur, but they are limited in number and scope, and can be accommodated within the framework. On the whole, default inheritance is a useful tool for paradigmatic representation without the shortcomings accompanying lexical representation.

1.2. Early Applications to Linguistics

An early application of inheritance to linguistics is Pollard and Sag's 1987 monograph on Head-Driven Phrase Structure Grammar (HPSG). This falls into the tradition of unification grammars (cf. Daelemans et al. 1992:210-12 for overview). Its primary focus is language's transmission of information. (1) HPSG consists of sets of rules, some of which apply to all languages. The following example illustrates the generality of these rules (13):

[SUBCAT < >] → H[LEX -], C

[which] says that "one of the possibilities for an English phrase is to be a saturated sign[3] ([SUBCAT < >]; here "< >" denotes the empty list) whose consitutents are a phrasal head (H[LEX -]) and a single complement (C); this rule subsumes a number of conventional phrase structure rules, such as those shown [below]:

S → NP VP

NP[4] → DET NOM

NP → NP's NOM

The first rule constitutes a generalization inherited on both the sentence and noun phrase level, with more specific information supplied in each case; the universal rules, too, are inherited by every language[5].

Gazdar's 1987 article, "Linguistic Applications of Default Inheritance Mechanisms" encourages the widespread application of the inheritance framework to theoretical linguistics, suggesting that inheritance networks can better account for some linguistic phenomena than existing theories. An example is De Smedt's (1984) analysis of Dutch verbs as found on the inheritance tree below (De Smedt 1984, cited in Gazdar 1987:47):

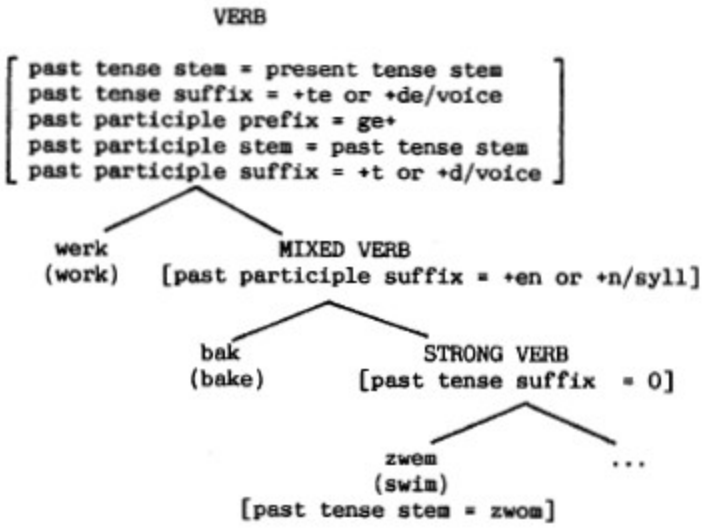

Fig. 2.5

De Smedt provides the default values, i.e. properties of weak verbs, at the highest node VERB; mixed verbs have one departure from the default in their differing past participle form, and

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[3] A saturated sign indicates that the phrasal head has the required set of complements, e.g. a verb accompanied by a nominative NP. (Pollard & Sag 1987:11-12)

[4] i.e. nominative NP

[5] Cf. Flickinger et al. 1985.

strong verbs inherit that property, plus they have a different past tense form. Gazdar (48) comments that "apart from the fact that [the tree] provides a non-redundant and therefore generalization-capturing representation of Dutch inflexions, … it accounts automatically for the phenomenon known to linguists as 'blocking' – the existence of an irregular form in general stops the simultaneous production of a regular form." Thus, default inheritance may have more than just a descriptive function when applied to language.

Furthermore, Gazdar applies this framework to pragmatics (the Gazdar-Soames Pragmatic Theory), which he represents in Fig. 2.6 (Gazdar 1987:52):

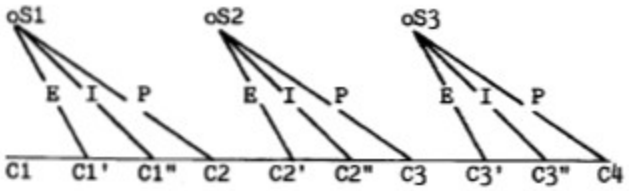

Fig. 2.6

It is interpreted as follows (52-3):

> The line represents the passage of time – well it's really pseudo-time, bits of it are time, and other bits aren't. We're in some context C1 which we can take to be mutually accepted beliefs, or whatever your theory of context is, and we utter sentence S1. That moves us to a new context C1', in which all the entailments E of S1 are added to context C1.
>
> This is a very idealized world in which there are no disagreements. Everything that is said is believed by everybody and so on. Our first step is to move to context C1' augmented with all the entailments. The next step (and this is what I mean by pseudo-time, since this is just a formal ordering, not a genuine temporal ordering) is to augment context C1' with all the implicatures that you can assemble on sentence S1. And by 'assemble', I just literally mean pulling them all out and adding them together, not doing anything fancier than that. You add all those that are consistent with C1' in order to form C1". Then finally, (although of course there's no notion of process here, it's just static definition) you add all the presuppositions P of S1 (again assembled just by lumping them all together) which are consistent with the context C1", which you've got by assembling it with the implicatures. So then you arrive at C2 which is the context in which the next sentence S2 is uttered. Then you go through the routine again.

Gazdar concludes by commenting on the incompleteness of this theory so far in the literature, noting that the work done so far in linguistics has only scratched the surface, and that a full formal theory does not yet exist. (54-5)

2. Linguistic Theories

Following the early implementations of inheritance in the 1980s, its influence expanded.

In the 1990s, more theories were developed that make use of these principles. I will discuss some examples below.

Word Grammar (Fraser & Hudson 1992) is among the first theories to incorporate default inheritance into theoretical linguistics. Word Grammar organizes linguistic facts as propositions, e.g. "noun isa word" (134). Taken together, these propositions describe properties of language. Where "isa" relations exist, inheritance is employed, as shown in the following example (Fraser & Hudson 1992:139):

(a) noun isa word.

(b) word has 1 head.

(c) so: noun has 1 head.

They (138) state the rule as follows: "If A isa B, then for any true proposition P that refers to B, it is possible to infer another true proposition Q that is the same as P except that A is substituted for B in P." The authors' treatment of default inheritance differs from that of most of the literature: while it is standard that an exception found on a subnode overrides the default, Fraser and Hudson make this process explicit instead of automatic, requiring a proposition negating the default in addition to the proposition stating the exception. They (141) call this process stipulated overriding (as opposed to automatic overriding, the usual process). Word Grammar encompasses all levels of language (and knowledge), which the authors have depicted in the following word type hierarchy (143)[6]:

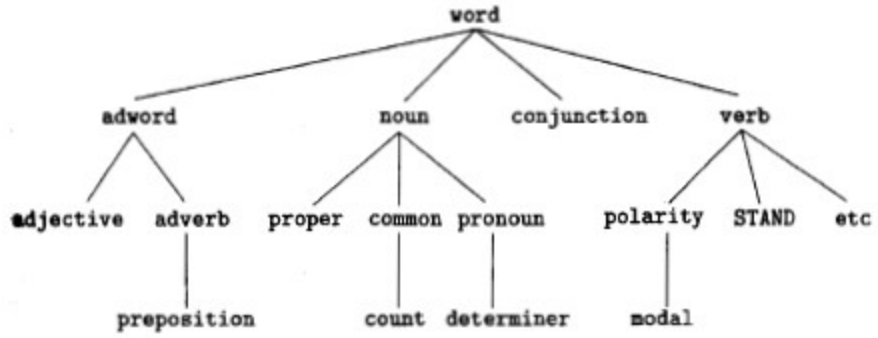

Fig. 2.7

The usual inheritance of properties applies here. (The authors acknowledge that some aspects of this hierarchy are nonstandard and arbitrary.)

Another implementation of inheritance is DATR, a language used for encoding lexical information. Evans and Gazdar (1996) describe how to use this language and how it may be applied. A lexical entry in DATR consists of a set of path/value equations organized as a series of "nodes." These supply the key properties of the lexeme as succinctly as possible, accomplished by the incorporation of inheritance. The following example, a description of the

[6] Adwords encompass words such as adjectives, adverbs, and prepositions, which the tree reflects.

verb *love*, illustrates the general format of a DATR description, as well as the process of inheritance therein (172-73):

VERB:
<syn cat> == verb
<syn type> == main

Love:
<> == VERB
<mor root> == love.

Word1:
<> == Love
<syn form> == present participle
<mor form> == <mor root> ing.

Word2:
<> == Love
<syn form> == passive participle
<mor form> == <mor root> ed.

Fig. 2.8

"Syn cat" represents syntactic category; "syn type" is syntactic type; "mor root" is morphological root; "mor form" is morphological form; Word1 is "loving"; Word2 is "loved"; == indicates a definitional statement; and empty brackets <>, the first subpath, "acts as a 'catch all' – any path for which no more specific definition at Word1 exists will inherit from VERB" (Evans & Gazdar 1996:172).

The first node, VERB, provides the general properties (main verb); the first subpath, <>, indicates that the lexeme *love* inherits these properties. The second (<mor root>) provides the root, *love*. Word1, *loving*, inherits the information from the *love* node, plus the information that it is a present participle with the form *loving*. Word2, *loved*, also inherits from *love*, with the information that it is the passive participle with the form *loved*. (173) This may also be expressed in tree form:

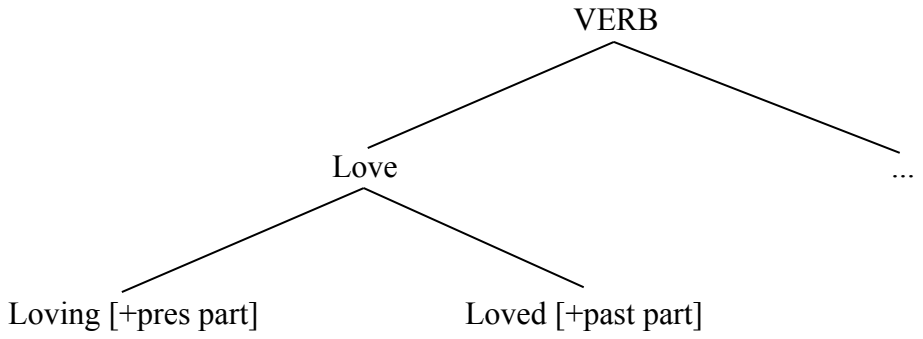

Fig. 2.9

Thus, DATR is an alternate method of expressing inheritance relations. Other methodological considerations include their treatment of multiple inheritance. Where this is necessary, the authors argue for multiple orthogonal inheritance (203), which allows for inheritance from multiple parent nodes without inheritance of contradictory properties (cf. Daelemans et al. 1992, section 2 above, and Fig. 2.13 below for an example of tree representation). The following is a sample DATR expression of orthogonal inheritance (Evans & Gazdar 1996:202-3):

```
VERB:
        <cat> == verb.

NP_ARG:
        <arg cat> == np
        <arg case> == acc.

TR_VERB:
        <cat> == VERB
        <arg> == NP_ARG.
```

Fig. 2.10

(NP_ARG is noun phrase argument; TR_VERB is transitive verb.) This example is a description of the transitive verb, which "is both a verb and a word that takes an NP complement" (203). It inherits the category from VERB, but argument information (i.e. accusative noun phrase complement) from NP_ARG. Thus, this framework elegantly captures multiple orthogonal inheritance.

In their analysis (1993) of Russian nominal inflectional morphology, Corbett and Fraser introduce their theory of Network Morphology. This framework organizes components in a hierarchical fashion and incorporates default inheritance. Each node is associated with morphological properties, explicated using the DATR language (cf. Evans & Gazdar 1996**)** as follows (Corbett & Fraser 1993:117):

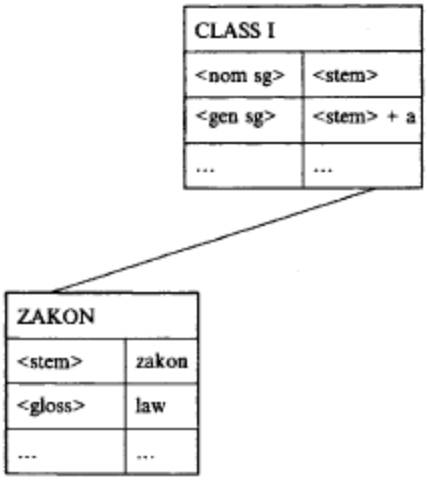

Fig. 2.11

The authors (114) assume four inflectional classes for Russian based on morphological commonalities instead of the traditional three. Their analysis eliminates the need for the canonical notion of the inflectional class; instead, they (127) base it solely on the hierarchy of morphological commonalities and generalizations, which are borne out by this style of analysis.

Hippisley (2001), too, analyzes Russian derivational morphology within the Network Morphology framework. Like Corbett and Fraser, he assembles the four inflectional classes of Russian into a single tree. The root node, MOR_NOUN (morphological noun) has the properties that are common to all nouns (in this example, the dative, instrumental, and locative plurals are common to all classes). Hippisley writes (228): "Where sharing is restricted to only certain declension classes, a node is set up as mother over only those classes. For example, sharing the oblique singular inflections is restricted to N_I and N_IV. A node N_O is set up which will store these facts, and from which N_I and N_IV will draw." The tree represents this as follows (loc. cit.):

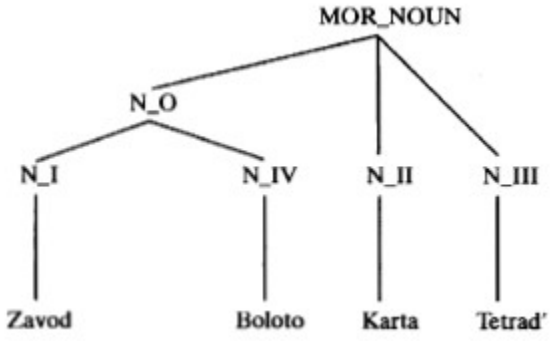

Fig. 2.12[7]

However, there are exceptions not represented on the tree above, e.g. the class I noun *soldat* 'soldier,' which has a genitive plural form like that of class II. Hippisley argues against default inheritance in cases such as this due to the repetition it would require: instead of stating the genitive plural form (bare stem) as additional lexical information, it allows for the generalization that *soldat* shares this form with classes II and IV. Thus, multiple orthogonal inheritance is employed: it is entered once on a single node rather than included three times on three separate nodes. (Hippisley 2001:229) This prevents the inheritance of contradictory information, i.e. *soldat* does not inherit all properties of classes I and II; it inherits all of the properties of class I except for the genitive plural form, as specified in Fig. 2.13 below (233):

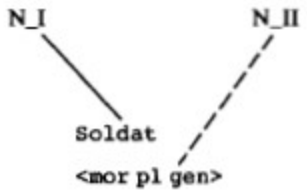

Fig. 2.13

[7] *Zavod* 'factory'; *boloto* 'swamp'; *karta* 'map'; *tetrad'* 'exercise book'

The primary source of inheritance is represented by a solid line; the secondary source, by a broken line. Thus, *soldat* inherits all properties associated with N_I except for those specified as pertaining to N_II.

Wunderlich and Fabri (1995) present another theory that makes use of inheritance, Minimalist Morphology (MM). The name refers to the authors' claim (240) that the theory "minimizes the number of assumptions as well as the number of information types required in the combinatorial system, and it also minimizes the amount of lexical specifications which the speaker has to memorize, thus simplifying the task of the child learning the language." It rests on eight principles; noteworthy in the context of this study are the use of underspecification and the lack of abstract morphemes. (In my analysis, I also refer to the surface forms of affixes and make use of underspecification.) MM also assumes the existence of the paradigm (cf. Wunderlich 1995, section 3.1 below). Moreover, they reject the idea of arbitrary assignment to inflectional classes (cf. Corbett 1982, section 3.1 below); rather, they assert that class membership should be clear to the learner based on phonological, morphological, and/or semantic features. Examples include (242) "the final ('thematic') vowel or consonant, the rhyme of the last syllable, the number of syllables (monosyllabicity or not), the preceding derivational affix, or by the number or the semantic sort of the arguments."

Wunderlich and Fabri make use of inheritance trees to represent lexical entries, which can display both the monotonic process of affixation and nonmonotonic inheritance. In their discussion of the German strong verbs, they present the following tree as a template for the lexical entry for these verbs (256):

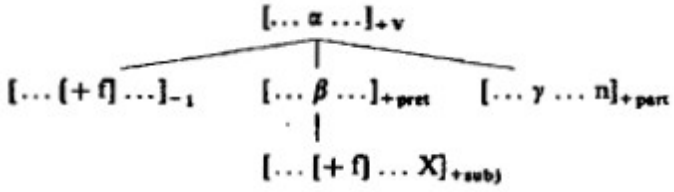

Fig. 2.14

In the tree above, α represents the root vowel in the infinitive form of the verb; β and γ represent the changes in this vowel due to ablaut. [+f] indicates fronting of α due to umlaut (found in the second and third person singular forms as well as in all forms of the subjunctive). The subjunctive inherits from the preterite node, and it is that vowel (β) that undergoes umlaut in the subjunctive (e.g. *fahren* 'to drive', preterite form *fuhr*, subjunctive *führe*). The structured lexical entries (i.e. trees) are designed as follows (255):

> (i) The base is the underlying representation of the lexical item. It is mostly visible in the unmarked categories, for instance in the infinitive of the verb.
>
> (ii) Each additional, not generally predictable, form constitutes a subpath of the tree. The subnodes are maximally underspecified and the information added at the nodes gets preference, so that it either enlarges or substitutes the information of the dominating node (the latter being a case in which non-monotonicity arises). All other information of the base is inherited by the subnodes.

Since I am dealing with paradigms rather than lexical entries, my trees do not contain underlying forms; the nodes from the hierarchy trees serve as root nodes for the properties of each element of the hierarchy supplied. Point (ii), however, does apply to my analysis below. Subnodes may add or replace phonological material, depending on the situation (cf. section 5.1 below for explanation of how I differentiate).

Next, I will discuss two approaches to German morphology that deal with noun plural forms. In his 1999 manuscript, Wunderlich employs several methods, including inheritance, to analyze the German noun plural suffixes. He divides German nouns into nine classes (plus multiple subclasses), arranging them as follows (2):

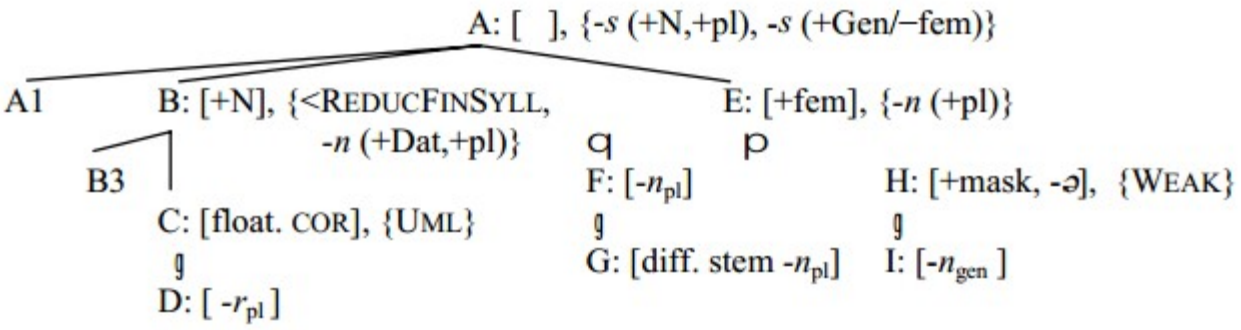

Fig. 2.15[8]

At each node, Wunderlich provides two types of information: lexical information (in square brackets) and regularities associated with the class (in braces). He notes (1999:2) that the regularities provided are inherited monotonically, but gender is not. Wunderlich's approach serves as an efficient method of sorting morphological regularities, reducing the description to only the most necessary and relevant information.

In their 1999 article, Cahill and Gazdar employ the DATR language to provide a description of German noun plural inflection. Using DATR, they (2) explicate phonological, morphological, morphophonological, and lexical features with an approach similar to Corbett and Fraser's Network Morphology. Cahill and Gazdar distinguish the noun classes according to plural desinence: *-s*, *-e*, *-er*, *-en*, and *-i* (*-i* is minor, however – it is a subgroup of a subgroup and thus a highly marked low node). Like Wunderlich (1999), they consider *-s* the default plural form. They encode the properties of each noun class and subclass in DATR and organize them on an inheritance tree. Finally, Cahill and Gazdar (24) note that "by allowing gender and phonology to determine the inflectional realisation of noun forms, we can reduce the declension classes to just those required for defining the plural alternations." This is in contrast to Wunderlich (1999), who includes zero plurals and nouns with umlaut alternations but no plural suffix (e.g. *Vater/Väter* 'father/fathers'). It is, however, in keeping with the minimalist character of DATR and permits generalizations e.g. those possible via inheritance.

Extending his analysis beyond the scope of morphology, Wunderlich (1997) combines morphology and syntax on a single tree by allowing nodes to encompass entire noun phrases.

[8] REDUCFINSYLL means that "all plural forms of typical nouns have a final syllable whose rhyme is reduced to either schwa or a syllabic sonorant … which cannot be stressed" (Wunderlich 1999:3).

After analyzing the definite article (cf. Fig. 2.21 below), he creates trees to represent the weak adjective declension (e.g. *alt* 'old') and the masculine noun (e.g. *Hut* 'hat'). He provides a method for combining these trees to represent the hierarchy of noun phrases as follows (54): "*Kombiniere jedes Element des Kopfes mit dem spezifischsten passenden Element des Nichtkopfes; beginne bei den mehr spezifischen Knoten. Kombiniere außerdem die höchsten unterspezifiezierten Knoten miteinander (wenn es geht)*." The following tree, displaying the declension of *der alte Hut* 'the old hat,' results (55):

Fig. 2.16

Thus, the nominative singular serves as the default; the dative and genitive forms are the most marked, as they are furthest from the root. All combinations are represented on the tree. With this framework, analysis of morphological paradigms may be put to use in syntactic analysis. (Wunderlich 1997:55)

Lastly, Rauch (2003) provides a novel application of inheritance trees, implementing them as an alternate representation of paradigms in her Gothic grammar. While earlier works generally apply inheritance to one aspect of a language, the grammar includes trees for the description of nouns, verbs, and adjectives. For example, Rauch provides an overview of Gothic ablaut on the following tree (82):

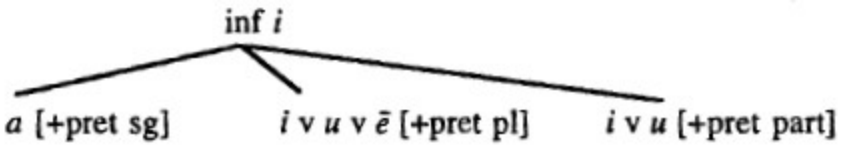

Fig. 2.17

Thus, all infinitive forms have *i* in the root vowel, and the preterite singular has *a* in all ablaut classes. The preterite plural may have *i*, *u*, or *ē,* according to class, while the preterite participle may have *i* or *u.* The verbal paradigms are completed by the addition of the appropriate suffixes. Rauch includes inheritance trees such as Fig. 2.17 alongside traditional paradigms throughout the grammar[9]. Thus, by demonstrating salient morphological regularities, the trees are of practical use to the language learner. The latter is one aim of this paper, and I will use a similar method.

[9] See also Steins (1998), who represents nominal inflectional morphology using both inheritance trees and paradigms.

3. Preliminary Methodological Considerations

A final area of the literature that I will now review deals with methodological issues relevant to this study. First, I will address the status of the paradigm in the literature, i.e. whether it should be considered a relevant entity; and I will review differing approaches to syncretism (within a single paradigm), with a focus on the role of disjunction in inheritance.

3.1. The Paradigm

Lieb (2005) discusses the history of the concept of the paradigm. He notes that the concept dates back to the ancient world, and is attested in ancient Egypt (as far back as 1200 B.C.E.), the Old Babylonian period (1894-1595 B.C.E.), and ancient Greece (as far back as 6th century B.C.E.). (The word *paradigm* – Greek *parádeigma* or Latin *paradīgma* – did not come to be used with this specific meaning until later. (1613) One theoretical consideration was what a paradigm represented, i.e. what "designated word form" the various forms of a paradigm constituted. According to Lieb (1614-15), prior to the Middle Ages, the designated word form was simply the nominative singular form. The concept of the abstract lexeme did not appear until the Middle Ages. Lieb (1617-18) also argues for the Word and Paradigm framework as used by the classical grammarians; while an objection to this has been that it was "bad" morphology, he argues that the classical paradigms do not represent morphological analyses, but syntactic ones. They focused on the various roles of forms in sentences, not on their component morphemes. This enabled, for example, the inclusion of analytic forms in paradigms. Once the focus is taken away from the morpheme unit, this method is, according to Lieb (1619), an effective description. Beyond that, he (1622) sees paradigms as "a vital link between morphology, word meaning, syntactic structure and sentence meaning." His own theory of the paradigm adopts the syntactic type as in the classical literature.

Besides their role in traditional grammars, Lieb (1619) discusses contemporary theories in which paradigms play a key role. A number of these have a connection to the inheritance framework, e.g. Minimalist Morphology and HPSG. My analysis rests on the assumption that paradigms are salient entities with the aim of providing an alternative representation of the data found in traditional grammars. Further, my analysis excludes analytic forms (not found in the nominal declensions of the languages I will analyze), but does essentially assume the existence of morphemes. Often, a single morpheme will be divided (e.g. the OHG strong tree contains *-n*, while the stem class tree indicates the theme vowel, e.g. *-ō-*; cf. Chapter 3), but the endings indicated are single morphemes. Consideration of only whole word forms would exclude some useful generalizations like the dative plural nasal ending and would prevent underspecification.

In his 1995 article, "Minimalist morphology: the role of paradigms," Wunderlich proposes a theory of paradigm structure within the Minimalist Morphology framework (cf. section 2 above). According to Wunderlich (1995:94), the set of possible affixes overgenerates potential forms, and "a paradigm is constructed by means of an ordered set of selection principles that evaluate the candidate word forms[10]." Wunderlich then describes the constraints on affixation and the construction of paradigms. A key principle is underspecification. To

[10] Cf. Fabri et al. (1995), who provide a computational application of MM based on this notion.

illustrate this, he (97) provides the preterite paradigm for the German verb *werfen* 'throw':

+pret		+pl	-pl
	+2	*warf-t*	*warf-st*
	-2	*warf-n*	

Fig. 2.18

The empty cell on the lower right is occupied by the first and third person singular form, *warf*; because it is composed only of the stem, it is the most underspecified and thus not included. Moreover, the paradigm is defined by the maximally specified form, the second person plural form *warft*. This has the most + features, i.e. +2, +pl. Once the paradigms have been constructed, they may be expressed in inheritance tree format.

Wunderlich assumes the existence of the paradigm as a theoretical entity, a notion which has been rejected by others (e.g. Müller (2004), see section 3.2 below). Not only do paradigms exist, but they serve the crucial role of filtering impossible forms. He (2003:1) defines the inflectional paradigm as "a set of inflectional forms of a lexical item (or 'lexeme') L, ordered according to the functional categories the forms express.... More precisely, an inflectional paradigm can be seen as a set of <form, function> pairs of L, each determining possible syntactic contexts of L." Further, he argues that regular paradigms aid in language acquisition, and are no longer needed afterward. Wunderlich then explains his objections to the word and paradigm account, writing (28): "each word form is determined by a function that alters some phonological material of a leading word form," i.e. that there are no explicit morphemes. He also rejects the inflection class feature account, i.e. that (29) "the gender of nouns [is] derivable from inflection class features (rather than the other way around), which associate nouns with paradigms." Wunderlich claims that such sets of features are unnecessary.

The inflection class feature account was proposed by Corbett (1982). His article deals with the problematic task of dividing Russian nouns into inflectional classes. According to Corbett, the attempts to do so based solely on morphological and/or gender information have been unsatisfactory, and scholars have proposed different numbers (two, three or four); in his view, the most effective (and parsimonious) method is to ignore gender and focus instead on inflectional class assignment. He assumes four classes, but this is for pragmatic reasons, namely (227): "with four declensional classes we can eliminate gender from the lexicon." Beginning with the class assignment, one uses his flow chart (216) to determine gender. Thus, Corbett organizes paradigms according to common patterns of inflection in order to minimize lexical information.

Müller (2004), on the other hand, rejects the concept of the paradigm, calling them (191) "epiphenomena, i.e., generalizations that can be derived from more basic assumptions." In his 2002 article, he treats syncretism differently from other scholars (cf. section 3.2 below): instead of analyzing functionally disparate forms separately, he (4) combines all homophonous forms together. Müller concludes (26) that by analyzing the forms in this manner, i.e. by focusing on the syntactic function, paradigms and morphemes are no longer relevant. He agrees with Lieb (2005) on this point: Lieb (2005:1617-18, cf. this section) sees paradigms as descriptions of syntactic forms, not morphological forms. As previously mentioned, I will incorporate the

notion of the paradigm and the morpheme (in its concrete, albeit orthographic, state).

3.2. Syncretism

Given, then, the assumption of the paradigm as a salient entity, one must deal with possible homophony within it. Syncretism presents challenges to the construction of inheritance trees: one can either represent it using disjunction ("or"-statements), which may interrupt the paths of inheritance, or repeat the homophonous forms according to the number of functions, which can be problematic from an underspecification standpoint. I will now review some diverse approaches from the literature.

In his 1995 paper, Blevins deals with syncretism in inheritance trees and lexical entries, seeking to eliminate as much as possible via underspecification. He (114) distinguishes two types of syncretism: "'artifactual' syncretism, which reflects an overarticulated grammatical description, ... [and] fortuitous syncretism, which involves simple homophony within a paradigm." The former is a result of neutralization of categories and may be reduced, while the latter cannot be eliminated. For example, the English verb *walk* has two forms in the present tense, *walk* and *walks*. The latter is the third person singular form; the former corresponds to first and second person singular and all plural forms. This is a matter of artifactual syncretism. Blevins suggests designating *walk* as the general form and *walks* as the exception, specified as third person singular. Given the lack of functional distinction between e.g. the first and second person plural forms, there is no need to distinguish them in the paradigm. Fortuitous syncretism, or homophony, exists where grammatical functions are not neutralized. Blevins provides the example of the German definite article declension:

	Masculine	Feminine	Neuter	Plural (all genders)
Nominative	der	die	das	die
Accusative	den	die	das	die
Dative	dem	der	dem	den
Genitive	des	der	des	der

Fig. 2.19

Note that the article *der* may represent masculine nominative singular, feminine oblique, and genitive plural. While the last two functions may be generalized as oblique forms, there is no single generalization that can encompass both those functions and the masculine nominative singular. Thus, *der* represents a case of simple homophony in this paradigm and will appear on two nodes on the corresponding inheritance tree. When mapping paradigms such as this, Blevins notes that multiple approaches to organization are possible; for reasons of economy, he suggests adopting an inheritance tree that reduces syncretism as much as possible (i.e. has the fewest repeat nodes). He proposes the following analysis for the German definite article (145):

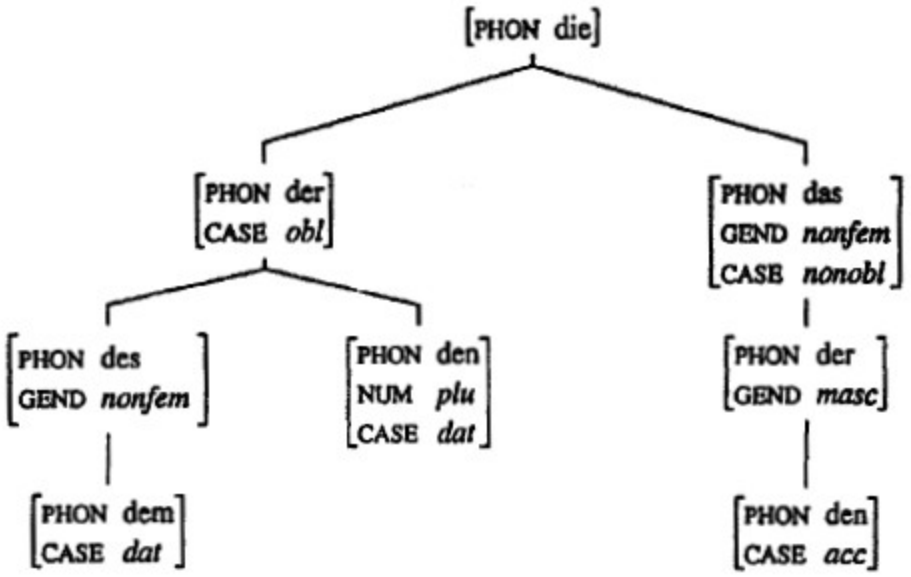

Fig. 2.20

Note also the multiple entries for *den*, which may denote either the dative plural or masculine accusative singular. Like *der*, these functions are incompatible and lack a single generalized description.

Blevins finds repetition preferable to disjunction, e.g. for *der* [CASE *obl* or *nonobl*], rejecting this on the grounds that disjunctive analyses (125) "do not support a distinction between linguistically significant generalizations, neutralizations in this case, from random assemblages of feature specifications." In other words, the two types of syncretism cannot be distinguished this way, while they are in analyses like Blevins' definite article hierarchy above. Such a tree allows for maximum underspecification, and where it is not possible, multiple items with the same phonological shape are listed separately.

For a counterexample, Blevins (120) refers to Karttunen (1984), who suggests that "the use of single entries with negative and disjunctive specifications yields more concise and revealing descriptions than the corresponding disjunction of nondistinctive lexical entries." In the description of his computational formalism of feature notation, Karttunen proposes the inclusion of negative values and disjunction. He argues that this is the most efficient way to deal with syncretism in paradigms such as the English present tense verb: when expressing the values of the verb *walk* (as opposed to *walks*) it is more efficient to say it is not third person singular than to list all of the forms it may be (first person singular, second person singular, and so on).

Wunderlich 1997 provides an alternate analysis of the data discussed by Blevins (1995)[11]. Like Blevins, Wunderlich employs inheritance to analyze the German definite article paradigm with emphasis on treatment of syncretism. Wunderlich also seeks to reduce syncretism via meaningful generalizations (underspecification), but their approaches differ in their treatment of disjunction. While Blevins seeks to eliminate it, Wunderlich (49) employs it in cases of

[11] Cf. Kilbury 1999 for a third analysis of the German definite article.

neutralization, arguing that it simplifies the analysis. Moreover, Wunderlich proposes the neuter singular article *das* as the default, most unmarked form in the definite article paradigm (thus placing it at the root of the trees); he (51) disputes Blevins' choice of the feminine singular and plural (all genders) form *die* as the default based on frequency in the paradigm. The syncretism makes the inheritance trees more difficult to design, so Wunderlich proposes three options. While he states that none are perfect, he chooses the following tree to follow through the rest of his analysis (51):

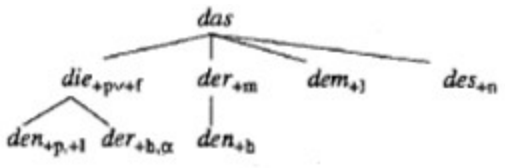

Fig. 2.21[12]

Thus, the neuter nominative singular serves as the default form; the neuter dative and genitive singular forms, *dem* and *des* respectively, are found to the right, while the left two branches contain feminine and plural forms and the masculine forms. Note the disjunction at the *die* node (plural or feminine) and the use of *α* which indicates two possible cases. There are still two instances of syncretism remaining on Wunderlich's tree, namely the two instantiations of *der* and *den*. Like Blevins, Wunderlich chooses to keep these two sets distinct because they are simply cases of homophony and do not reflect grammatical neutralization.

Evans and Gazdar (1996, cf. section 2 above) describe the treatment of homophony in the DATR language. They, too, keep homophonous forms separate, as there is no disjunction in DATR. Instead, they handle homonymy by providing separate nodes for each form, as shown in the following lexical example (196):

Bank1:
<> == NOUN
<mor root> == bank
<sem gloss[13]> == side of river.

Bank2:
<> == NOUN
<mor root> == bank
<sem gloss> == financial institution.

Fig. 2.22

These lexemes are treated separately, despite their homonymy. In tree form, there would be two separate nodes. Thus, following this framework, homophonous inflectional endings are kept separate and disjunction avoided.

[12] n=gen, l=dat, h,α (h,l or h,n)=dat or gen, h=acc.

[13] Semantic gloss

Müller (2004:197; cf. section 3.1 above) takes the opposite stance. He proposes the Syncretism Principle, which states that "identity of form implies identity of function (in a domain Σ, and unless there is evidence to the contrary)." Thus, grammatical neutralization should be assumed. He excludes syncretism of singular and plural forms from this statement.

4. Method

4.1. Data

I have chosen as my departure point two historical stages in the German language, Old High German and Early New High German. One motivation for this choice was, to my knowledge, no existing study of the inflectional morphology of these languages using inheritance trees. The biblical translations of *Tatian* (Old High German) and Martin Luther (Early New High German) are major texts in their respective eras, and, as parallel texts, serve as a convenient point of comparison. Moreover, each has a non-Germanic analogue: the *Tatian* text is accompanied by the corresponding Latin rendition, while Luther employed the Greek New Testament to carry out his translation. Thus, I have chosen to compare Old High German with Latin, and Early New High German with Koine Greek. It is hoped that this presentation of the morphological data would be of use to a translator confronted with these pairs of texts. Because the *Tatian* text is the most limited corpus – it not a complete biblical translation, encompassing passages primarily from Luke, John, and Matthew[14] – I have elected to consult these same passages in the remaining three texts for data purposes. The Old High German and Latin *Tatian* texts are found in Braune 1994. Further, I referred to the 1522 version of Luther's Bible published by Hermann Böhlaus Nachfolger (2001); and the Greek New Testament that I consulted is the edition by Tregelles (1857-61). The grammars that I consulted include Braune 2004 for Old High German; Buck 1933 and Greenough & Allen 2001 for Latin; Wegera 1987 for Early New High German; and Moulton 1955 for Koine Greek.

In the paradigms, a single morphological function may correspond to multiple possible forms. The reason for this may be diachronic (e.g. one form gives way to another over time so that the attested form depends on the date of a manuscript) and/or dialectal. In other cases, there may be considerable variation within a single text. This is especially true of Old High German and applies also to Early New High German. Thus, where there is clearly a single form used consistently in the *Tatian* text, I have elected to give only the *Tatian* form; this is often the case due to era and dialect (East Franconian). In other cases, there is no clearly predominant form, so I have chosen to provide both, marked with a slash (e.g. the masculine and neuter instrumental *-u/-o*). This may or may not affect the structure of the tree. However, due to the great diversity of the German dialects, generalizations across the dialects would only be possible at the highest levels (e.g. strong, weak); it would be impractical to depict the paradigms in tree form.

Additionally, as has previously been discussed, inheritance trees capture the most significant morphological generalizations. For example, in OHG, the dative plural of strong nouns always has a nasal ending (*-n* or *-m*). For the sake of clarity in the tree (and generalizations), thematic vowels are found on a single node with *(-)* following, to indicate that

[14] Cf. p. vi for the complete list of passages in *Tatian*.

the vowel may be in coda position or preceding a consonantal coda. Other morphological information, including more details on variation, is found in the prose accompanying the trees. Because I have chosen to include the most underspecified forms possible, the prose will indicate homophonous forms, should there appear to be gaps on a tree.

4.2. Theoretical Considerations

The following analysis assumes the theoretical existence of the morpheme and that nouns are inflected by means of affixation. Because I use the inheritance trees to represent the possible forms of a given noun as concisely as possible, it is necessary to extract generalizations such as "all first declension Latin nouns have the ending *-a* in the nominative singular." The phonological/orthographic information provided on the trees may represent an entire morpheme or a portion of one. If the same category appears twice, e.g. once on a high node and once on a subnode (e.g. the Old High German dative plural has *-n* on the strong noun tree, and the theme vowel indicated on the stem class trees), addition of phonological information is indicated by hyphens on both sides, e.g. *-ō-*. Phonological material from the right edge of the affix is found on the higher node, while the left edge of the affix is found at the lower of the two. If a new ending is indicated, the form given on the subnode overrides the inherited form.

I have elected to design inheritance trees in a manner similar to those of Wunderlich (1997) and Rauch (2003), that is, I make use of disjunction where necessary. Disjunctive statements enable the clearest presentation of the data, particularly if the trees are to be used as a translation aid: they permit the inclusion of multiple functions for a single ending so that the ending need not be listed multiple times (in cases of highly syncretistic paradigms). This is an advantage of this format over a traditional paradigm. Following Wunderlich (1997), in cases of true neutralization, affixes are merged onto a single node; in cases of homophony (i.e. highly dissimilar functions that have not undergone leveling), separate nodes are used (cf. section 3.2 above). The symbols ∨ 'or' and ∧ 'and' are used to express disjunction. [+gen] ∨ [+dat], for example, indicates that the affix may represent the genitive or dative case. The statement, [+dat ∧ +pl], indicates the properties of dative singular and dative plural, i.e. that the affix in question may be either singular or plural, representing a form of disjunction. A comma indicates 'and', e.g. an affix that is [+masc, +gen] is both masculine and genitive.

4.3. Structure of the Analysis

I have arranged the analysis to follow by language. I will begin with Old High German and Latin, and will end with Early New High German and Greek. For each language, a tree encompassing generalizations which pertain to all inflectional classes is included. Moreover, the hierarchy of inflectional classes and subgroupings is provided. I then include trees with high nodes as the root (groupings such as strong and weak nouns in OHG/ENHG, then gender); and, lastly, provide individual trees for each stem class. Each of these trees displays morphological properties associated with the node. Because the four languages differ structurally, the format of the analyses differs somewhat. (For example, there is no strong/weak distinction in Latin or Greek.)

Chapter 3
Old High German

1. Introduction

Old High German (OHG) is the earliest attested stage of the German language, with texts dating back the eighth century. It is said to end (and Middle High German to begin) in the eleventh century. Overall, Old High German shows a large degree of variation in inflection. The corpus encompasses six diverse dialects, so clear generalizations about the morphology are not always possible. For this reason, I have elected to focus on the *Tatian* corpus in this study. The *Tatian* text dates from the 9th century and is composed in the East Franconian dialect. Despite this narrow focus, there remains some orthographic variation, as is described below. Where the *Tatian* forms are inconsistent or forms are not well attested, multiple forms are provided (e.g. the *a*-stem instrumental, section 2.1.1); where one clearly predominates, the single dominant form is provided on the tree (e.g. the dative plural, this section). (Braune 2004:1, 5)

Old High German nouns fall into two major declension types, strong and weak. Strong nouns include those with historically vocalic stems, while the weak nouns have consonantal stems. Five total cases are marked: nominative, genitive, dative, accusative, and instrumental. The instrumental case had become uncommon by the Old High German period and is not attested in all classes and genders. The strong noun classes include *a*, *ja*, *wa*, *iz/az*, *u*, *ō*, *jō*, and *i*-stems; some nouns from the minor stem classes (see below) also follow the strong pattern. The weak declension encompasses the *-n* declension, of which the feminine has two subclasses, the *ōn*- and *īn*-stems.

The inheritance tree below displays the hierarchy of declension types and inflectional classes in Old High German:

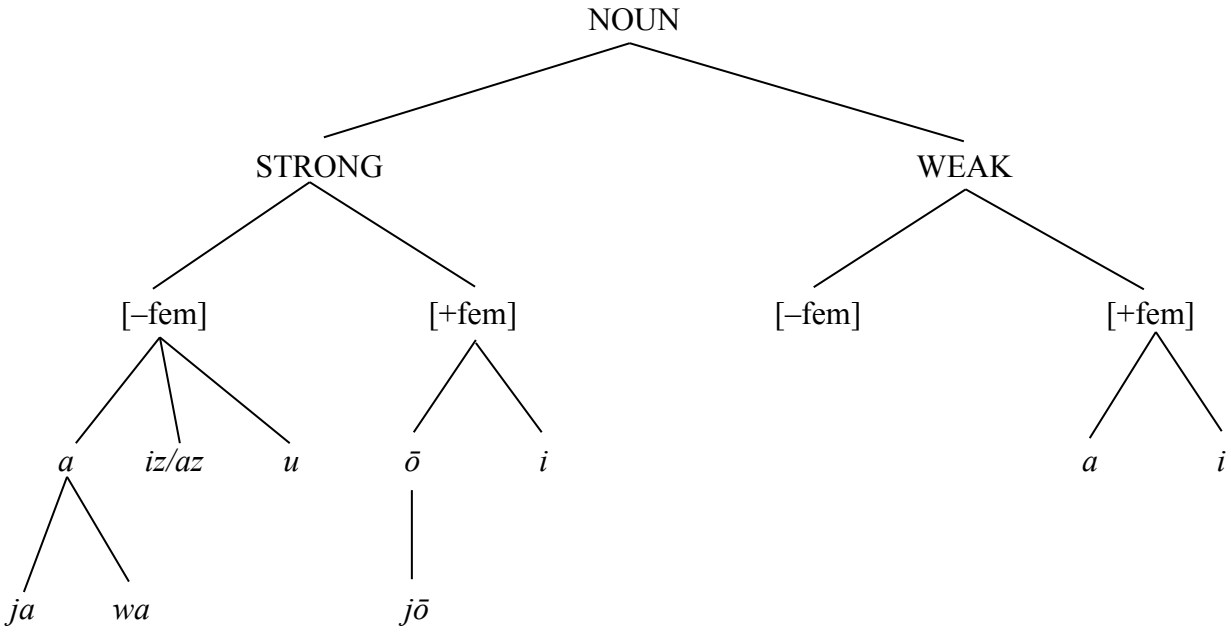

Fig. 3.1

Each node is associated with morphological properties, depicted on inheritance trees in the sections to follow below. These properties are generalizations, e.g. that all nouns have a nasal ending in the dative plural. Each subnode inherits the inflectional information associated with the nodes above it, such that all stem classes under NOUN (Fig. 3.1) inherit the aforementioned dative plural *-n* (Fig. 3.2). Likewise, the *ja*-stem node inherits the properties associated with NOUN, STRONG, [–fem], and *a*-stem. The default, underspecified properties are neuter gender, nominative case, and singular number. Neuter is the default gender due to its status as [–masc, –fem]. The nominative case and singular number are unmarked and therefore the default.

I exclude minor noun classes (i.e. those comprising one or two nouns) when they are completely or nearly completely subsumed under other classes. The kinship terms in *-er* are subsumed under NOUN (Fig. 3.2) with the exception of *fater* 'father', which shares the nominative and accusative plural ending with the *a*-stems (Fig. 3.4) in the *Tatian* corpus. The participial stems (i.e. *friunt* 'friend' and *fiant* 'enemy'), too, are declined like the *a*-stems. Of the root stems, the feminine nouns are subsumed under NOUN; the masculine noun *man* follows the *a*-stem declension, with the exception of the nominative and accusative plural, which consist of the bare root. (Braune 2004:213-17)

Fig. 3.2 below illustrates the morphological commonalities among the nouns of all genders and stem classes:

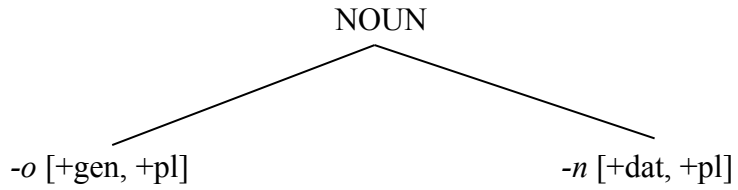

Fig. 3.2

Each noun has final *-o* in the genitive plural; this may be part of a longer ending, e.g. in the feminine *ō*-stems (full ending *-ōno*, cf. section 2.2.1). The Old High German dative plural form of strong nouns varies, including within a single text, but a nasal ending (*-m* or later *-n*) is consistently found. Because the *Tatian* corpus has only one example of the historically inherited *-m* (*tuochum* 'cloths, garments' (dat. pl.) (Luke 2:7; 51 line 19), the ending is generalized to *-n* on the tree above. The weak nouns consistently have *-n* in the dative plural, e.g. *nollōn* 'hills' (dat. pl.) (Luke 23:30; 56 line 35), although *-m* is attested in other texts. (Braune 2004:185) The nasal is preceded by a vowel: the feminine strong nouns contain a thematic vowel dependent on stem class (see below), while the masculine and neuter strong nouns have a back vowel (*-u-* or *-o-*). The vowels completing the weak endings vary according to gender.

2. Strong Nouns

The strong nouns inherit the morphological information from the NOUN tree above (Fig. 3.2); otherwise, there are no properties common to all strong noun classes, as each class is defined by distinct vocalic endings.

2.1. Masculine and Neuter

The tree below exhibits the features common to the OHG masculine strong nouns. Because the masculine shares common endings with the underspecified neuter gender, they are considered together here.

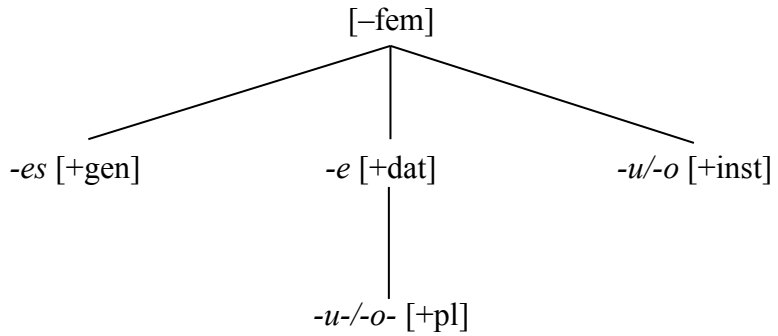

Fig. 3.3

In the singular, shared forms include the genitive singular desinence *-es* and the dative singular *-e*. The instrumental singular may be either *-u* or *-o*; *Tatian* has only one example of the

instrumental, *stedu* 'bank (inst.)', (Matt. 13:48; 26 line 22). Due to its limited attestation in the corpus, I include both variants above.

Additionally, *-u-* and *-o-* both occur as thematic vowels before the dative plural nasal ending. This completes the suffix, which may be *-on* or *-un* (plus one attestation of *-um*; *-om* is found in other texts). The vocalic variation is illustrated by *tagun* (Luke 1:7; 47 line 11) alongside *tagon* 'days (dat pl)' (Luke 1:25; 48 line 65). The *-un* ending occurs thirteen times in the text, while the *-on* ending occurs five times.[15] In addition to the above, one adds the inherited genitive plural *-o*.

Beyond the generalizations above, however, there are differences. For all neuter nouns, nominative and accusative singular forms are homophonous. In most stem classes, the singular and plural nominative and accusative forms are the same, e.g. the form *wort* 'word' may be nominative or accusative, singular or plural.

The masculine strong nouns exhibit all of the suffixes found in the neuter paradigm above. Nominative and accusative forms are, as in the neuter, homophonous; however, singular and plural forms are not. While the singular forms consist of the root alone, the nominative and accusative plural exhibit a vocalic ending (added to the root) dependent upon stem class.

2.1.1. *a*-stems

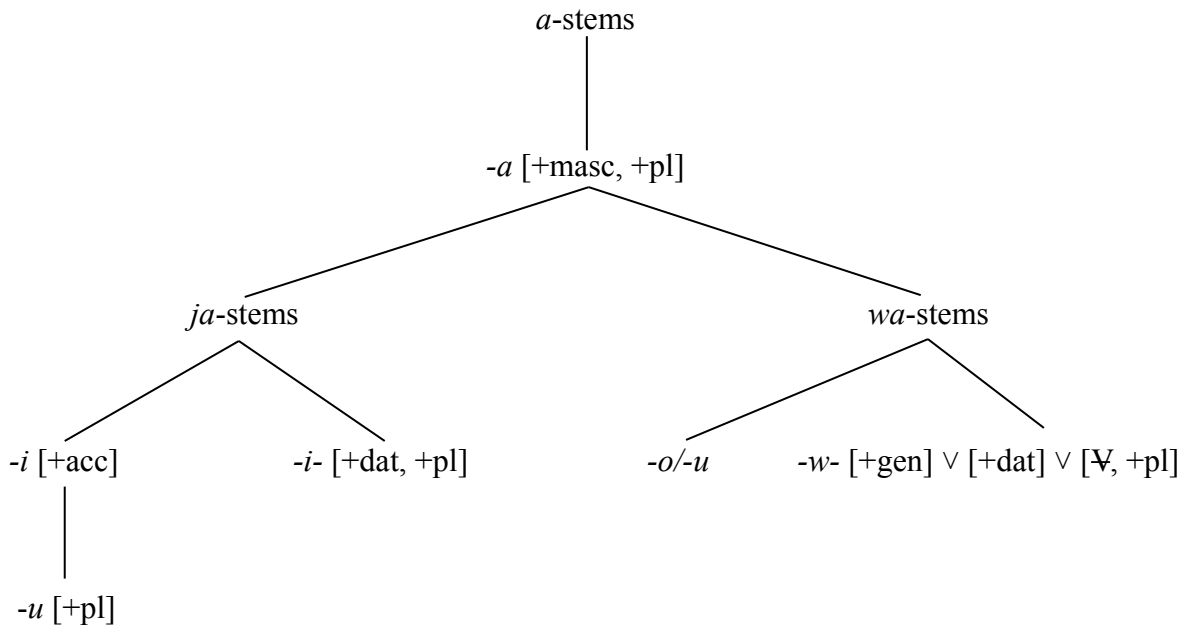

Fig. 3.4

Masculine and neuter *a*-stem nouns inherit the endings outlined in the [-fem] tree (Fig.

[15] The text counts given here reflect the forms found in the original manuscript. Later scribes changed nine of the *-un* forms to *-on* and the sole *-um* form to *-un*, yielding five *-un* forms and fourteen *-on* forms (and none with *-m*). Braune (2004:185) notes that *-on* is the typical Franconian form.

3.3); additionally, the masculine nouns have -*a* in the nominative and accusative plural. All other endings are already outlined above. (Braune 2004:184)

The masculine and neuter *ja*-stem nouns are characterized by the ending -*i* in the nominative and accusative singular and by the occasional presence of a glide -*i*- preceding the inherited desinences. According to Braune (2004:189), the glide was uncommon even in early texts, and it is unattested in the *Tatian* text. The masculine plural ending -*a* is present, as in the *a*-stems. The neuter nominative and accusative plural may have -*i* as in the singular; however, *Tatian* has the irregular plural form -*u*, e.g. *cunnu* 'people' (Luke 1:48; 49 line 62). Additionally, there is variation in the dative plural ending: -*i*-, -*u*-, and -*o*- are all possible. I have included -*i*- above, as it is the form Tatian uses (e.g. *finstarnessin* 'darkness (dat pl)' [John 1:5; 46 line 9]) and is typical of the Franconian dialect (Braune 2004:190).

The *wa*-stems distinguish themselves from the *a*-stems in that the nominative forms end in a back vowel (-*o* or -*u*); and that the back vowel is carried through the paradigm as a glide -*w*- preceding the inherited endings. Unlike the glide -*i*- occasionally present in the *ja*-stems, the -*w*- occurs consistently. Instances include the neuter dative singular *tresouue* 'treasure' (Matt. 12:35; 24 line 15) and the masculine dative singular *seuue* 'sea' (Matt. 12:50; 25 line 75). (Braune 2004:193)

2.1.2. -*iz*-/-*az*-stems and *u*-stems

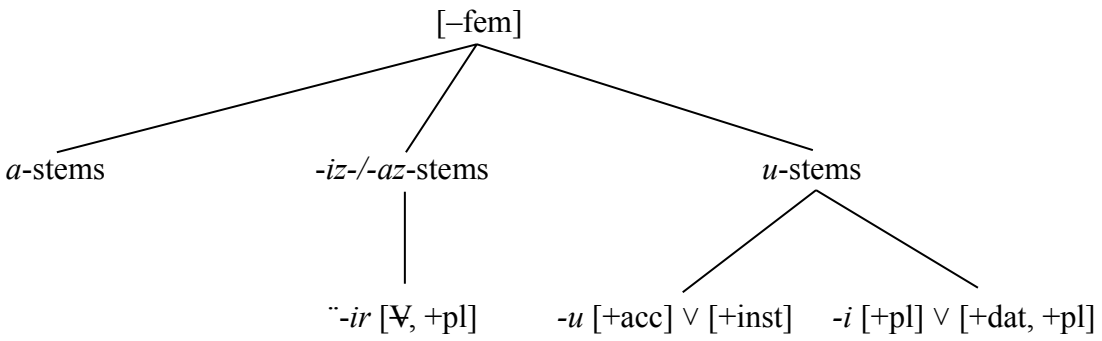

Fig. 3.5

Neuter nouns of the -*iz*-/-*az*-stem class deviate from the template outlined in Fig 3.3 above. In this class, the plural forms of all cases have -*ir*, accompanied by the requisite umlaut of *a* in the stem. As a result, the nominative and accusative singular and plural forms are not homophonous. In the genitive and dative plural, this syllable precedes the expected endings, yielding the forms -*iro* and -*irVn*. No examples of the dative plural alternants exist in the *Tatian* corpus. (Braune 2004:188)

Most *u*-stem nouns are masculine, with the exceptions of the feminine noun *hant* 'hand' and the neuter noun *fihu* 'cattle' (Braune 2004:206). Many forms in this declension mirror those of the *i*-stems (section 2.2.3). The nominative and accusative forms are homophonous; this applies in the singular and the plural. The ending -*u* is found in the nominative, accusative, and instrumental singular forms. The nominative and accusative plural ending is -*i*, and -*i*- is the

thematic vowel in the dative plural, e.g. *hentin*[16] (Luke 1:74; 50 line 44**)**. (Braune 2004:205-6)

2.2. Feminine

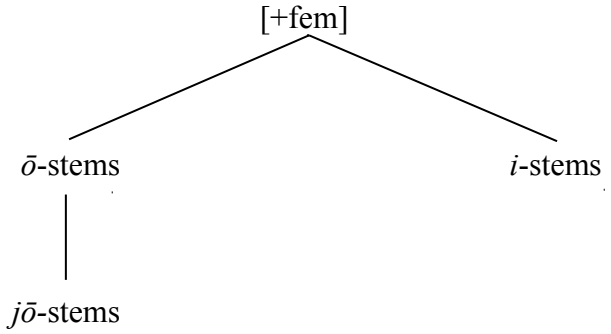

Fig. 3.6

The feminine forms differ from their neuter and masculine counterparts in their greater degree of consistency within the stem classes. While there are multiple variants of some neuter and masculine forms, e.g. the dative plural, the feminine declensions carry the thematic vowels fairly consistently through the paradigm. Thus, back vowels are typical of the *o*-stems, while i-stems contain *i*. Due to this consistency, however, the only feature the stem classes have in common is vocalic endings. The only feature associated with the [+fem] node, then, is feminine gender; desinences are specific to the respective stem classes.

2.2.1. *ō*-stems

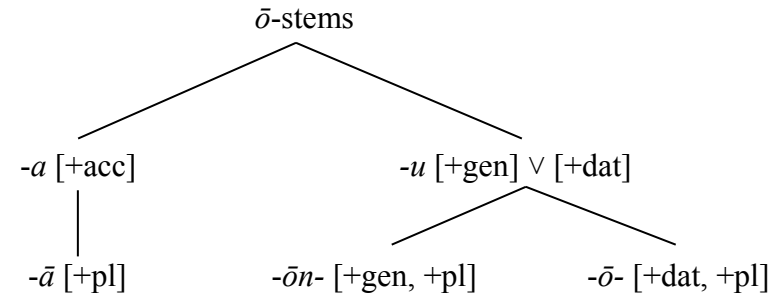

Fig. 3.7

Among the feminine *ō*-stems, nominative and accusative forms are homophonous: in the singular, the ending is *-a* (which may also be the genitive singular ending). In the plural, the *Tatian* text has forms with long *-ā*: *rātissā* 'parables' (acc) (Matt. 13:53; 26 line 36) and *thiotā* 'peoples' (acc) (Matt. 13:19; 26 line 10). While Braune (2004:195-6) lists *-a* as the most common genitive singular ending, he also mentions that leveling with the dative ending (here, *-u*) often occurs. In *Tatian*, this is indeed the case: the genitive singular ending is *-u* in all but two

[16] According to Braune (2004:204), the form *hentin* is unusual. The dative plural of *hant* more commonly mirrors that of the *a*-stem nouns, i.e. *-um*, *-un*, or *-on*.

instances, namely *uuamba* 'of the womb' (Luke 1:42; 49 line 49) and *sibba* 'of peace' (Luke 1:79, 51 line 57). Examples of leveling include *erdu* 'earth' used in the genitive (*in herzen erdu* 'in the heart of the earth' [Matt. 12:40; 24 line 32]) and in the dative (*fon erdu* 'from the earth' [John 12:32; 55 line 39]). The genitive and dative plural forms exhibit the thematic vowel *-ō-*, yielding the genitive plural ending *-ōno* and the dative plural *-ōn*[17]. (Braune 2004:195)

2.2.2. *jō*-stems

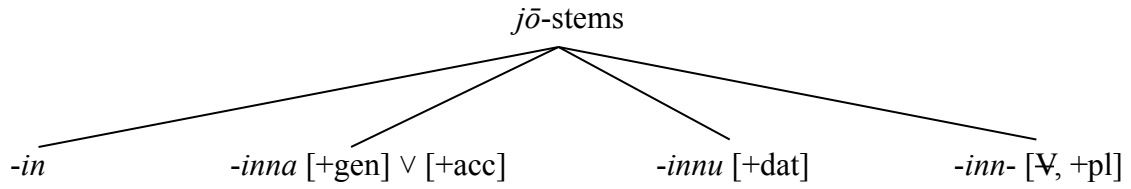

Fig. 3.8

The *jō*-stems comprise two types: the first historically ended in a glide (cf. the *ja*-stems, section 2.1.1), but by the era of the *Tatian* manuscript, these had for the most part lost the glide, and were declined like *ō*-stems (Braune 2004:197). This group is thus subsumed by the *ō*-stem tree. The second type, containing the additional syllable *-inn-*, deviates from the usual feminine strong noun pattern outlined above. The nominative forms have the ending *-in*, and the accusative singular is homophonous with the genitive instead of nominative, with the ending *-inna*. The dative singular mirrors the *ō*-stems with its *-u* ending (*-innu*). The nominative and accusative plural are homophonous; all plural forms contain *-inn-* before the inherited endings. (Braune 2004:197-8)

2.2.3. *i*-stems

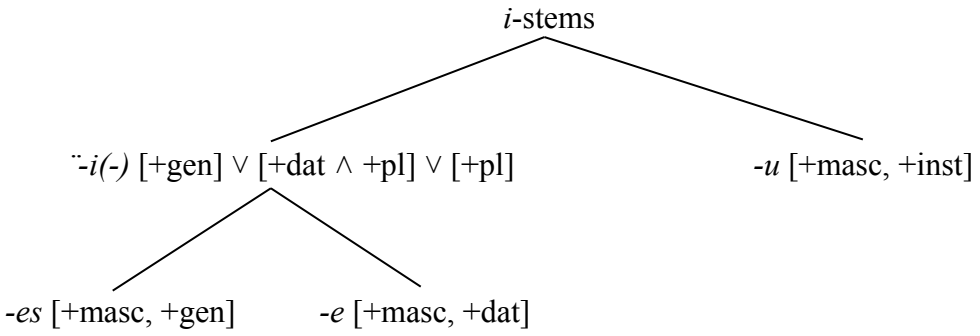

Fig. 3.9

i-stem nouns may be masculine or feminine. Because they fall under the [+fem] node, all features are [+fem] unless otherwise specified as [+masc], overriding the inherited feature. This stem class is characterized by the thematic vowel *i*. The nominative and accusative forms are

[17] Later texts may have a variant with short *-o-* (Braune 2004:195).

homophonous. The ending *-i* occurs in the nominative plural forms in both the masculine and feminine, as well as the feminine genitive and dative singular; *-i-* is also the thematic vowel preceding the nasal in the dative plural. Stems containing *a* undergo *i*-umlaut in these instances. The masculine instrumental ending is consistently *-u*[18]. (Braune 2004:201, 203) In the feminine, *i*-umlaut of *a* in the root occurs in all cases but the nominative; in the masculine, umlaut is found in all cases in the plural, but in the singular, only in occasional instrumental forms. Unlike the other forms with umlaut, the genitive plural form may occur with or without the umlaut trigger *-i-*. For example, *Tatian* has two variants of the genitive plural of *zan* 'tooth': *zeno* (Matt. 13:42; 26 line 6) and *zenio* (Matt. 13:50; 26 line 28). The *-o* form is more common by the 9th century (Braune 2004:201).

3. Weak Nouns

Figs. 3.10 and 3.11 below display the hierarchy of weak inflectional classes and the features associated with the WEAK node, respectively:

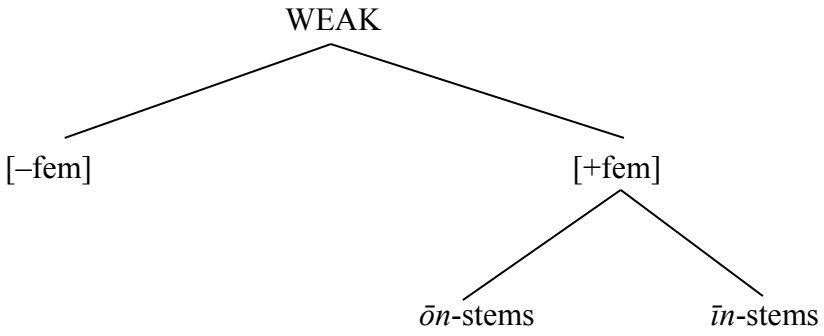

Fig. 3.10

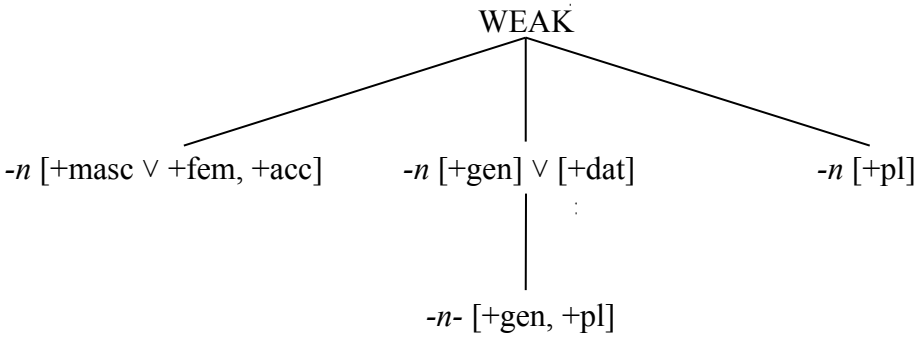

Fig. 3.11

Weak nouns are characterized by final *-n* throughout the singular oblique forms, plus the nominative and accusative plural forms, which are consistently homophonous. (The nominative and accusative singular, however, are not.) The genitive plural combines *-n-* with inherited *-o* to

[18] The later form, typical of the 9th century, is *-u*, while the earlier form was *-iu*, with or without umlaut of *a* in the root. (Braune 2004:201)

yield the desinence *-no*, and the dative plural has the inherited nasal ending, as in the strong declension.

3.1. Masculine and Neuter

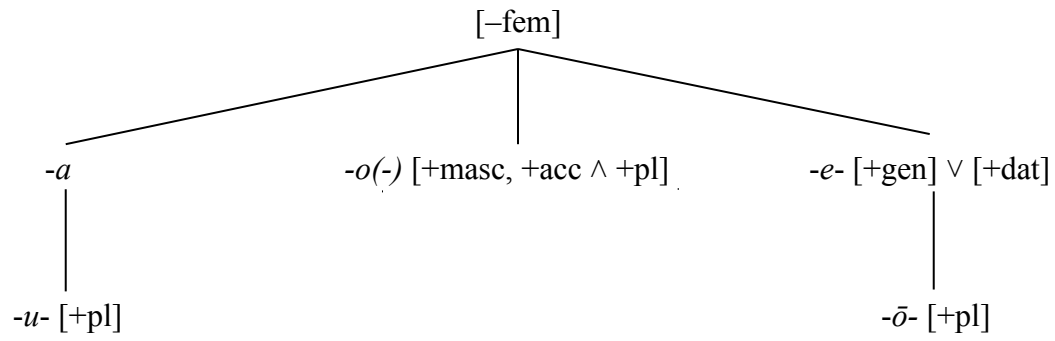

Fig. 3.12

The vocalic ending of the neuter nominative and accusative singular is *-a*; the plural has *-u-*, e.g. *herzun* 'hearts' (acc.) (Luke 1:17; 47 line 38). The genitive and dative forms are homophonous: in the singular, the thematic vowel is consistently *-e-* in the *Tatian* corpus (as is typical of the Franconian dialect, though *-i-* is found elsewhere)[19], while the plurals of both have *-ō-*, e.g. *nollōn* 'hills' (dat. pl.) (Luke 23:30; 56 line 35). (Braune 2004:207) The weak masculine nominative singular ends in *-o,* and in the *Tatian* text, the masculine accusative singular and the nominative and accusative plural have the thematic vowel *-o-*, e.g. *namon* 'name' (acc. sg.) (Luke 1:13 ; 47 line 28); this is also the Franconian form, and *-u-* may be found elsewhere. The genitive and dative mirror the weak neuter forms above. (Braune 2004:207)

3.2. Feminine

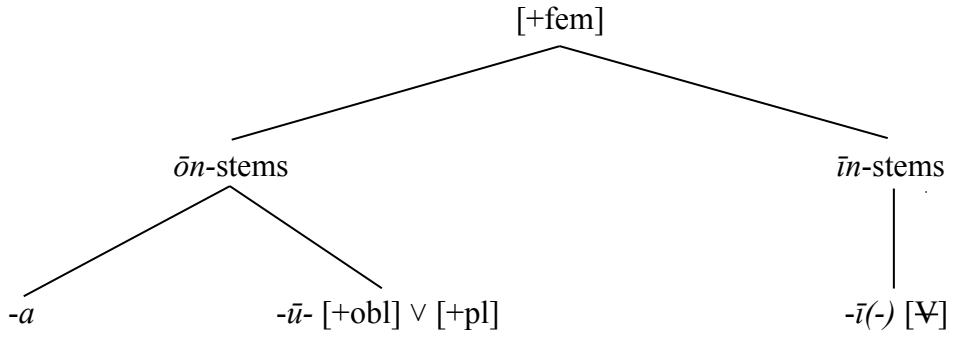

Fig. 3.13

The weak feminine nouns fall into two stem classes, the *ōn*-stems and *īn*-stems. *ōn*-stems are characterized by the nominative singular ending *-a*; the nominative plural and oblique

[19] The genitive and dative singular ending *-in* is found in southern dialects. (Braune 2004:207)

singular forms contain -*ū*-. The genitive and dative plural forms mirror the neuter and masculine with -*ō*-. The *īn*-stems contain -*ī* in all cases in both singular and plural. This stem class distinguishes itself from the other weak nouns in that in the singular oblique cases, the weak -*n* ending is often not found. The desinence is most commonly -*ī* for all singular cases: the phrase *fon hohī* 'from on high' (Luke 2:78; 51 line 54), for example, contains a dative. The nominative and accusative plural may also lack -*n*, and thus may override the inherited -*n* endings. (Braune 2004:207, 211)

Chapter 4
Latin

1. Introduction

Latin nouns are divided into five stem classes, or declensions. The first four developed from the inherited PIE stem classes, while the fifth is an independent development. Classical Latin distinguishes seven cases: nominative, genitive, dative, accusative, ablative, locative, and vocative. Among these seven cases, some case syncretism exists in all declensions. Unless specified on the subnodes, the following pairs of forms are always homophonous: nominative singular and vocative singular; locative singular and genitive singular; locative plural and ablative plural; dative plural and ablative plural; and neuter nominative and accusative, regardless of number. Due to its number of homophonous forms, the neuter is the most underspecified gender in Latin.

The inheritance tree below displays the hierarchy of inflectional classes in Latin:

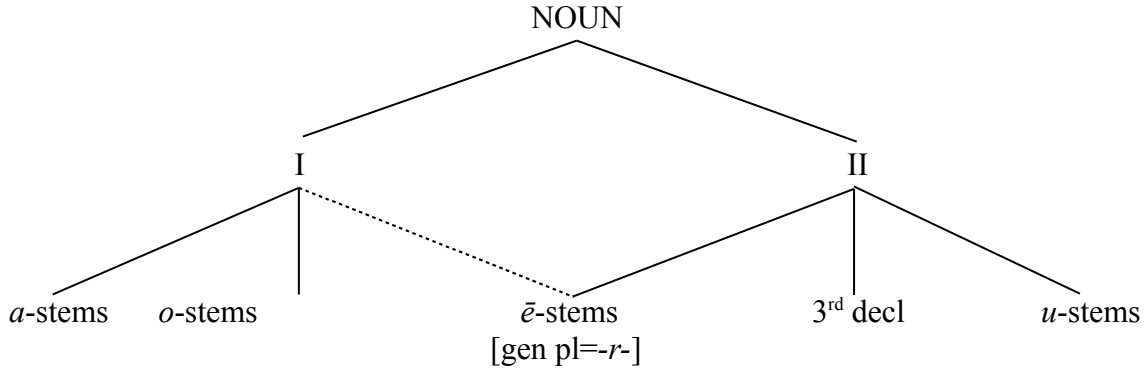

Fig. 4.1

As on the Old High German tree, each node above is associated with morphological properties. Latin, however, has a somewhat different structure. Here, the node NOUN is associated with several affixes, and there is no sharp division between strong and weak. Instead, there are two groups, I and II, that represent classes with certain common inflections. Moreover, in Old High German, there is usually a clear correlation between stem class (and thus, affixes) and gender, making two gender-based nodes necessary and salient. In Latin, on the other hand, stem class membership (which often may be determined by phonological shape of a lexical item) alone is usually not a good predictor of gender. Thus, gender will not be specified on nodes above the level of the stem class. The only salient contrast is that between masculine/feminine and neuter, which occurs only in stem classes that have neuter nouns (second, third, and fourth).

Additionally, the *ē*-stems present a complicated case in that they share properties with both groups I and II. Because of this, multiple inheritance is employed to show this declension's relationship to both nodes. The solid line indicates the primary parent node (in this case, group II) from which most properties are inherited, while the broken line indicates inheritance of a

smaller number of properties. The property inherited from group I, namely the genitive plural, is specified on the tree to avoid contradictions.

The following inheritance tree illustrates the properties associated with the NOUN node, which are the common desinences found in all classes:

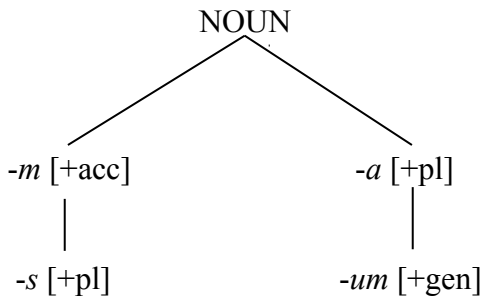

Fig. 4.2

The commonalities include the ending *-m* in the accusative, preceded by a thematic vowel; *-s* in the accusative plural, preceded by a (long) thematic vowel; and *-um* in the genitive plural. The latter may appear alone or be preceded by *i* (*-ium*) or a long thematic vowel plus *r* (e.g. *-ārum*). Further, the ending *-a* indicates the neuter plural. This is overridden on subnodes specifying masculine and/or feminine gender. Note that the endings listed above may represent other categories: for example, the masculine nominative singular of the second declension also has final *-s*.

2. Group I

The following tree shows the morphological properties common to the group I nouns:

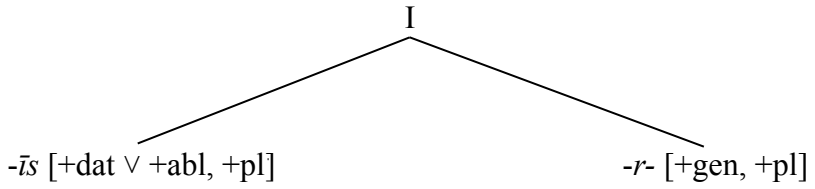

Fig. 4.3

Thus, the nouns in group I have *-īs* in the dative and ablative plural, as well as an extended genitive plural ending. To the inherited *-um*, one adds a long thematic vowel plus *r*. The other affixes from Fig. 4.2 above are also inherited.

2.1. *ā*-stems

The inheritance tree below illustrates the endings for *ā*-stem nouns:

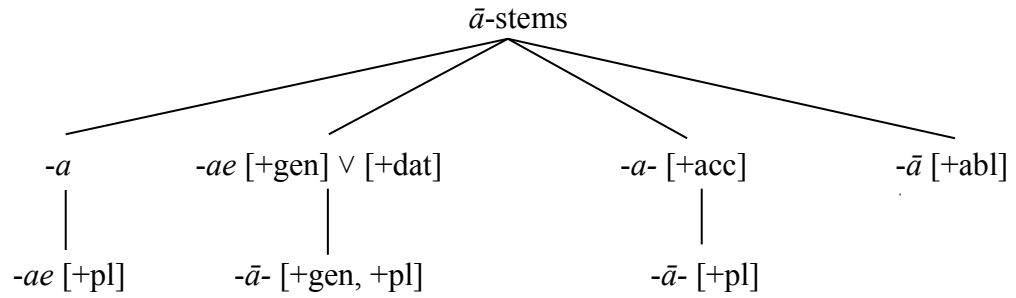

Fig. 4.4

This stem class consists primarily of feminine nouns with a small group of masculine nouns. The nominative singular ending is *-a*; *-ae* represents genitive and dative singular, as well as the nominative plural; *-am* is the accusative singular ending; and *-ā* occurs in the ablative singular. The genitive plural is *-ārum* and accusative plural is *-ās*. (Buck 1933:175)

2.2. *o*-stems

The inheritance tree below displays the commonalities among the Latin o-stem nouns, or the second declension:

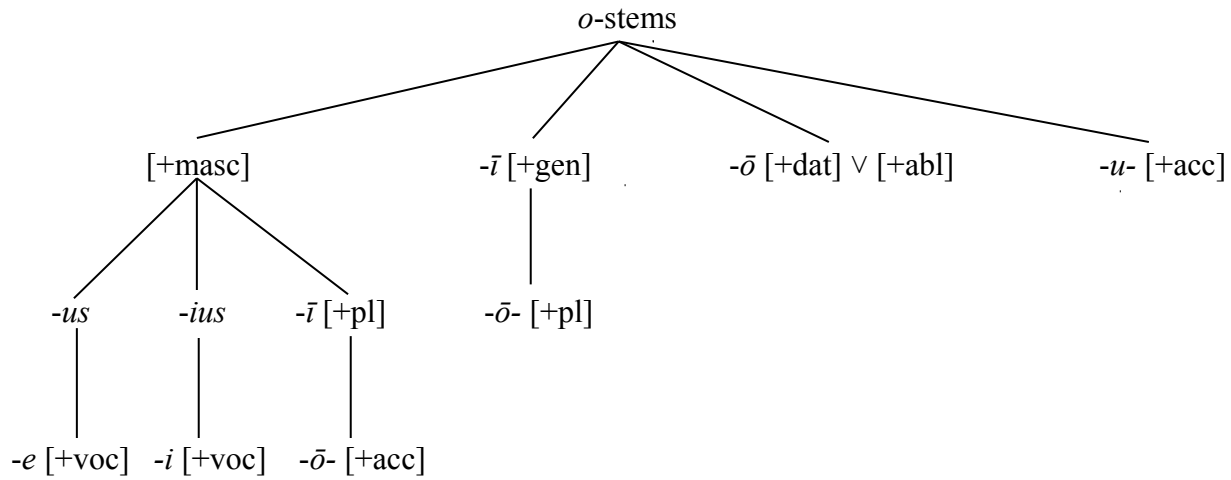

Fig. 4.5

The majority of the nouns in this stem class are masculine and neuter, all of which are represented above. Feminine *o*-stem nouns are declined like the masculine nouns. (Greenough & Allen 2001:21) As previously mentioned, neuter nouns are homophonous in the nominative and accusative; thus, as shown above, the ending *-um*, marked as [+acc], is found in the neuter nominative and accusative, as well as the masculine accusative. The masculine singular ends in *-us*. The masculine vocative singular, unlike the nouns of other classes, differs from the nominative: masculine nouns in-*us* have the vocative ending *-e,* while masculine nouns ending in *-ius* have the vocative ending *-i.* In the remaining oblique singular cases, the masculine and neuter nouns agree: the dative and ablative singular have *-ō*, and the genitive and locative

singular have -*ī*.

The plural forms exhibit a similar pattern. The neuter nominative and accusative plural have -*a*, while the masculine nominative and accusative plural have -*ī* and -*ōs*, respectively. The remaining affixes are common to all genders, namely genitive plural -*ōrum* and dative, ablative, and locative plural -*īs*.

This declension also includes a second masculine noun type with -*er* in the nominative singular, e.g. *ager* 'field' and *puer* 'boy.' These nouns decline alike in all other cases, e.g. the genitive singular forms *puerī* and *agrī*. Those that (historically) have a consonant preceding the -*er* syllable (e.g. *ager*) undergo syncope in the oblique cases (-*er-* > -*r-,* e.g. *ager*, gen. *agrī* but *puer,* gen. *puerī*). (Buck 1933:99-100, 180)

3. Group II

Below is the hierarchy of the group II stem classes:

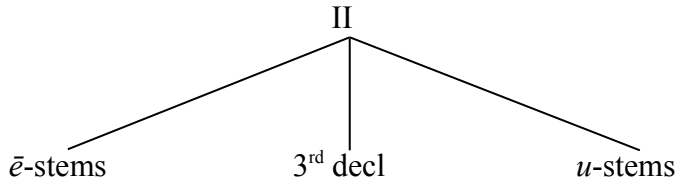

Fig. 4.6

Note that the *ē*-stems node contains the additional specification of the genitive plural form, which is inherited from the I tree (Fig. 4.3). The following inheritance tree illustrates the properties of the second group of nouns (II):

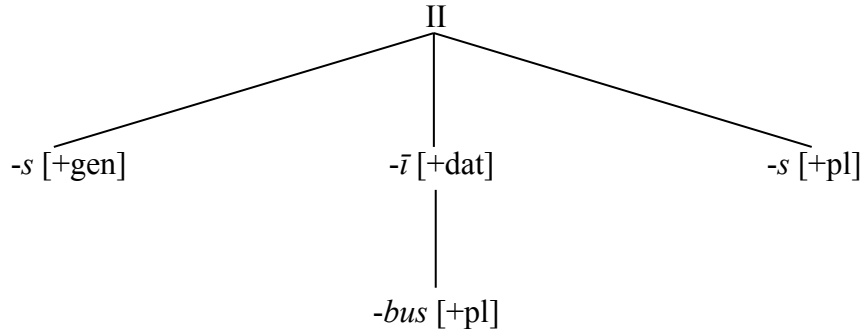

Fig. 4.7

In Group II, the genitive singular forms contain a final -*s*, while the dative singular is marked by -*ī*. In the plural, the nominative and accusative also have final -*s* preceded by a long vowel. The dative and ablative plural are homophonous, ending in -*bus*.

3.1. *ē*-stems (Fifth Declension)

The Latin fifth declension consists of feminine nouns with the exceptions of *diēs* 'day' and *meridiēs* 'noon' (both masculine). It is marked by the thematic vowel *-ē-* and appears to be an Italic innovation that is "built up from some few forms containing an inherited *ē*, on the analogy of the *ā*-declension" (Buck 1933:204). Fig. 4.8 provides the morphological information specific to this class.

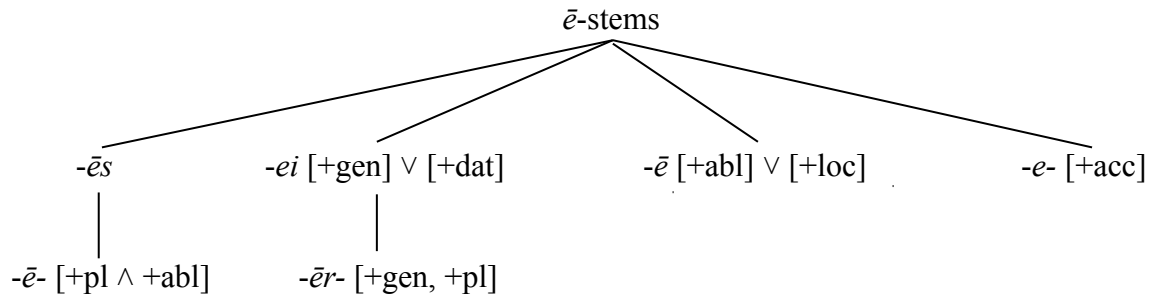

Fig. 4.8

Thus, the nominative singular has *-ēs*, while the thematic vowel shortens in the genitive and dative singular *-ei* and accusative *-em*; the ablative singular is *-ē*. In the plural, the nominative and accusative are homophonous, namely *-ēs*; the genitive plural is *-ērum* and the dative and ablative plural affix is *-ēbus*. (Greenough & Allen 2001:38) Note that the genitive plural ending (long thematic vowel plus *r* preceding the inherited ending) differs from the suffixes in the other group II stem classes. I treat this as a case of multiple inheritance instead of a simple overriding of the default: the *ē*-stems inherit the *-V̄rum* genitive plural type (and the vocalic genitive singular) from group I and the nominative and accusative plural *-s* as well as dative and ablative plural *-bus* from group II (cf. Fig. 4.1).

3.2. Consonantal and *i*-stems (Third Declension)

The Latin third declension comprises multiple PIE stem classes which decline alike in the singular oblique cases and most cases in the plural. The nominative forms vary as a result of phonological change, often obscuring a lexeme's stem class membership, which is apparent instead from the oblique stem. Third declension stem classes include the stems ending in a stop, e.g. *pēs*, gen. *pedis*; *r*-stems, including kinship terms e.g. *pater,* gen. *patris* 'father'; *n*-stems, e.g. *nōmen*, gen. *nominis* 'name'; *s*-stems, e.g. *genus*, gen. *generis* 'descent, class' (*r* replaces *s* in the stem as a result of rhotacism); and *i*-stems, e.g. the masculine noun *turris*, gen. sg. *turris*, gen. pl. *turrium* 'tower' and the neuter *mare*, gen. sg. *maris*, nom. pl. *maria* 'sea.' *i*-stem nouns are the only subset of the third declension to include *i* before the genitive plural and nominative neuter singular endings, indicated in parentheses below. (Buck 1933:185, 187, 189, 191, 193) Suffixes for all three genders are found on Fig 4.9 below.

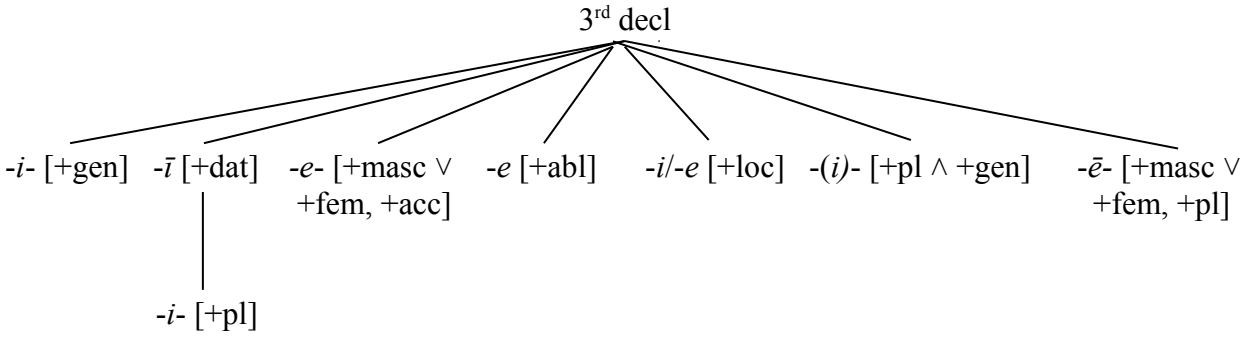

Fig. 4.9

The endings depicted on the tree above are the result of a merger of the endings historically belonging to the consonantal stems with some belonging to *i*-stem nouns. In the singular, all nouns have the genitive singular in *-is*, dative singular *-ī,* and ablative singular *-e*. Masculine and feminine nouns have the accusative singular ending *-em*. The locative suffix is *-i* or *-e*, neither of which is attested in the *Tatian* text. In the plural, masculine and feminine nouns have *-ēs* in the nominative and accusative, while neuter nouns have *-(i)a* in both; all have *-(i)um* in the genitive plural and *-ibus* in the dative and ablative plural. Unlike the first two declensions, the nominative and accusative plural forms are homophonous in all three genders. (Buck 1933:193)

3.3. *u*-stems

The tree below depicts masculine and feminine endings o the inherited *u*-stem class:

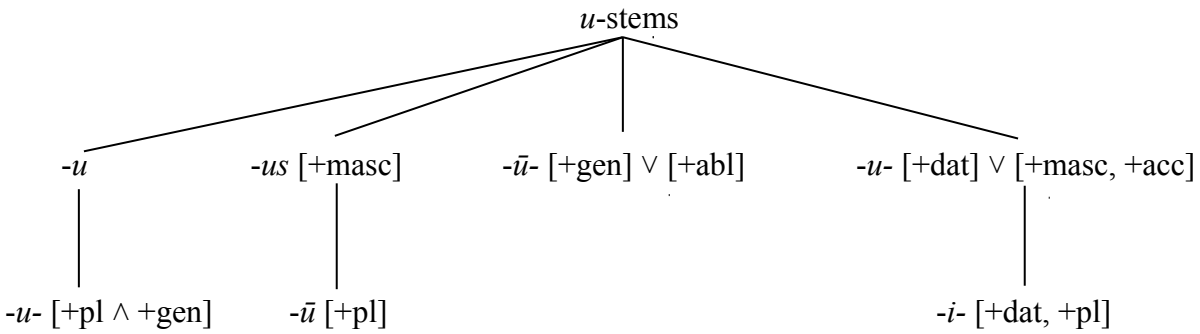

Fig. 4.10

This stem class is comprised of nouns of all three genders, but masculine nouns are most common. (Greenough & Allen 2001:36) The declension is clearly marked by the thematic vowel *u* in all desinences (with the exception of the dative and ablative plural variant *-ibus*). In the masculine and feminine (e.g. the feminine noun *tribus* 'tribe'), nominative singular forms have *-us*; in the genitive singular, the vowel is long, yielding *-ūs*. The dative singular is *-uī*, accusative singular is *-um*, and ablative singular is *-ū*. In the plural, the nominative and accusative are homophonous, namely *-ūs*; the genitive is *-uum*, and the dative and ablative plural

form in the Latin *Tatian* text is -*ibus*. The variant -*ubus* is found elsewhere, but is less common. (Buck 1933:198, 200).

The neuter nouns of the fourth declension, e.g. *genu* 'knee', decline similarly to the masculine and feminine nouns above. As in the other declensions, the differences rest in the homophony of nominative and accusative in both the singular and plural. The nominative and accusative singular ending for this declension is -*u*, and the plural is -*ua*, displaying the expected neuter plural -*a* ending in addition to the thematic vowel. (Buck 1933:198)

Chapter 5
Early New High German

1. Introduction

Early New High German (ENHG) is a direct descendant of Old and Middle High German, but unlike OHG and MHG, the status of ENHG is controversial. Jakob Grimm's tripartite periodization was challenged by Wilhelm Scherer in 1878 with his proposal of a transitional period between MHG and NHG. External factors such as the the founding of the first German university at Prague (1348), the invention of the printing press (1436), among others, play a role in dating the beginning of ENHG. Internal criteria such as the ENHG Diphthongization and the ENHG Monophthongization are not found simultaneously in all dialects (Penzl 1984: 9-13, 49-68).

Penzl argues for the late 14th century as the beginning and circa 1730 as the end of ENHG. By the end of the 14th century, the written language reflects the medley of regional dialects (unlike in MHG); by the early 18th century, it has become standardized and dialectal characteristics are diminished (but, as he notes, this is not the case for the spoken language). (Penzl 1984:12-13)

Rauch (1991) proposes a language-internal criterion for the end of the ENHG period, namely the increased use of the *e*-plural on lexemes counter to the tendency toward apocope: "The startling fact is that for all genders, whether with or without genetic reflex, the apocopated *-e* makes a dramatic seventeenth century return to signal the plural" (Rauch 1991:372). This morphological shift can thus mark the end of the ENHG period without appealing to external factors.

The dialects of ENHG parallel the modern German regional varieties: in the south, Bavarian and Alemannic; in the west, Franconian dialects; and in the northern and eastern High German territory, Saxon, Thuringian, and Silesian**.** In this period, High German begins to replace Low German as the standard written language in northern Germany. (Penzl 1984:15, 17)

Beginning in the Old High German period, full vowels in unstressed syllables become reduced to schwa (orthographically *e* in Middle High German), a process begun by the fixing of initial stress in Germanic (Wegera 1987:69). In ENHG, apocope of unstressed final *-e* occurs frequently. As a result, case marking on nouns is often either unclear or nonexistent, and morphological information is conveyed chiefly through the declension of other parts of the noun phrase (determiners, adjectives).

The suffixes provided below have *-(e)-* as the syllable peak[20]. The parentheses indicate that syncope may occur, though it occurs with varying frequency depending upon the form. The ending *-er*, for example, has very few attested syncopated forms, and *-(e)ns* retains the *e* unless the root has a final *-e*. More variation is found with *-(e)s*: syncope tends to occur in polysyllabic

[20] In Luther's Bible, *i* often occurs instead of *e*, e.g. *Gottis* 'of God' (Luke 1:35; 212)

lexemes with a final nasal or liquid (in addition to those with final *-e*, as above), while *-e-* tends to be retained following a dental consonant. Finally, *-(e)n* tends to be syncopated following a liquid (with a polysyllabic root), but otherwise tends to retain the *e*. Syncope is otherwise not to be expected. (Wegera 1987:64-5, 67)

Apocope may occur in the dative singular form in *-(e)* and becomes more frequent over time (and is very common in southern dialects throughout the ENHG period), with the exception of the Saxon dialect. (Wegera 1987:115-9) Given that the latter was Luther's dialect, the masculine and neuter dative singular *-e* is attested my corpus (i.e. the passages parallel to the Tatian text[21]): there are seventeen instances of *-e* and 68 instances of apocope. Several pairs attest to variation: *hymele* (Matt. 6:10; 32) vs. *hymel* 'heaven (dat. sg.)' (Matt. 28:18; 132); g*eschlechte* (Matt. 12:45; 60) vs. *geschlecht* 'generation (dat. sg.)' (Matt. 12:41; 58); and *tage* 'day (dat. sg.)' (Luke 1:59; 214) vs. *mittag* 'noon (dat. sg.)' (Matt. 12:42; 58).

Early New High German distinguishes four cases: nominative, accusative, dative, and genitive; and singular and plural number. Like the other languages already discussed, the grammatical genders include masculine, feminine, and neuter. Nouns fall into two broad declensional patterns: strong and weak. Strong nouns are characterized by a variety of possible endings, including oblique forms without suffixation, while weak nouns have *-n* in the oblique cases. Despite the general trend toward syncretism, Early New High German has 21 inflectional classes. (I will discuss eighteen here, excluding three minor classes which, according to Wegera 1987:89, have a very limited attestation in a single dialect.) These are based on combinations of five singular paradigms and seven plural forms. I will use the singular paradigms as the main subgroupings below. Fig. 5.1 shows the hierarchy of the noun subgroups, and Fig. 5.2 the property associated with the NOUN node:

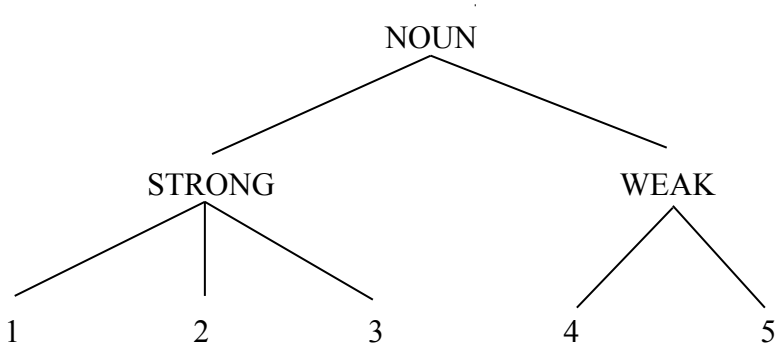

Fig. 5.1

[21] Cf. p vi for the complete list of passages.

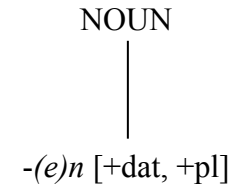

Fig. 5.2

The desinence common to all nouns is *-(e)n* in the dative plural. In the remaining cases (i.e. in the nominative, accusative, and genitive), plural forms are homophonous. The strong nouns encompass groups 1, 2 and 3, while the weak nouns encompass groups 4 and 5. As previously mentioned, these numbers correspond to Wegera's (1987:87) singular paradigms.

2. Strong Nouns

The strong nouns can be divided into three diverse singular declensions that do not share any specific affixes. The sole commonality is homophony (i.e. the root form) in the nominative and accusative singular.

2.1. Group 1

The first group, based upon the singular desinences, is outlined on the inheritance tree below:

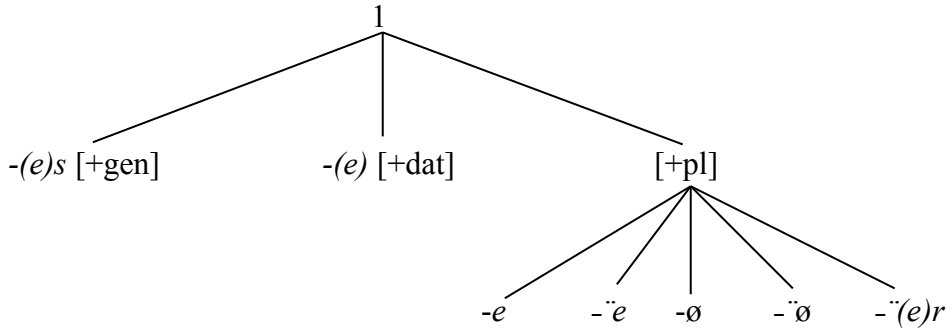

Fig. 5.3

Thus, the hallmarks of this group are *-(e)s* in the genitive singular and sometimes *-e* in the dative singular. Five plural forms may combine with this singular declension: *-e-*, *¨e,* -ø-[22], ¨ø, and -*¨er*. As previously mentioned, the plural forms are homophonous in all cases but the dative, to which the suffix inherited from the NOUN tree is added, yielding e.g. -*¨(e)r(e)n*. Nouns in Group 1 are consistently masculine or neuter.

[22] While a ø ending would normally not be included on an inheritance tree due to underspecification, it is necessary in this instance in order to set apart the bare root as a possible plural form.

2.2. Group 2

The following tree provides the suffixes for the second group of strong nouns:

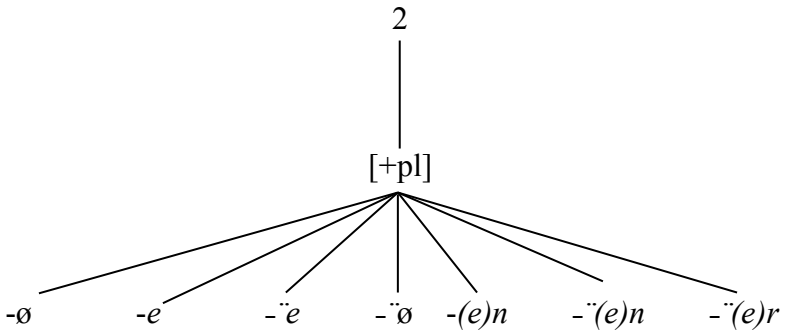

Fig. 5.4

The second group is characterized by a lack of suffixation in all cases in the singular. In the plural, there are seven possible desinences, namely -ø, *-e, -¨e, -¨ø, -(e)n, -¨(e)n,* and *-¨(e)r*. Nouns in this group are historically feminine, but masculine and neuter nouns may fall into the same pattern for phonological reasons. (Wegera 1987:133)

2.3. Group 3

Lastly, the third group of strong nouns is outlined below.

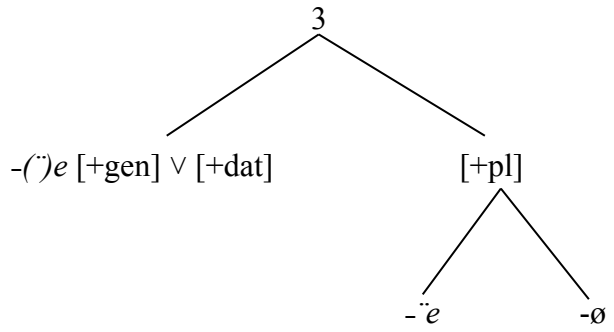

Fig. 5.5

In this group, the genitive and dative singular are marked by *-(¨)e.* In the plural, the ending may be either *-¨e* or -ø. This group is less common than the previous two and contains feminine nouns only. (Wegera 1987:132-3) Thus, the strong noun classes account for fourteen declensional patterns (five in group 1, seven in group 2, and two in group 3).

3. Weak Nouns

Unlike the strong noun declensions, the weak nouns have numerous suffixes in common,

as summarized on the inheritance tree below.

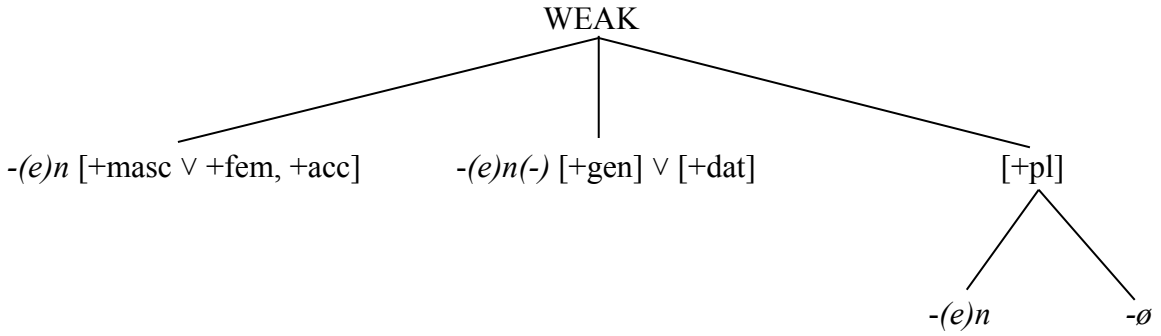

Fig. 5.6

In the weak declension, the masculine and feminine nominative and accusative singular forms are not homophonous: here, the accusative singular adds *-(e)n* to the root. The genitive and dative singular also add *-(e)n*, and the same ending marks the plural.

The aforementioned weak endings account for the entire group 4 declension, thus the node for this group does not add any morphological information. Group 5, on the other hand, adds one more ending, as shown below:

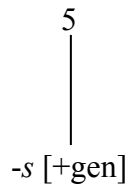

Fig. 5.7

This *-s* is added to the inherited *-en* ending, yielding *-ens* in the genitive singular, the sole distinguishing feature between the two paradigms. Group 4 nouns may be any gender, while group 5 contains masculine and neuter nouns only.

A summary of the distribution of plural forms can be found on the following inheritance tree. More common (i.e. found in a larger number of inflectional classes) plural suffixes are found on higher nodes than those pairing with the fewest singular declensions.

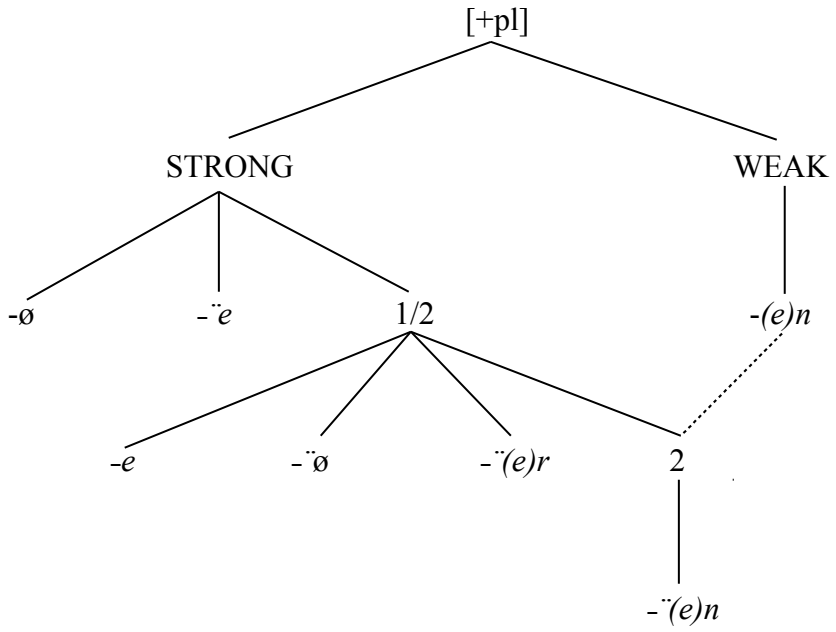

Fig. 5.8

Thus, the strong nouns (groups 1, 2, and 3) can all take -ø or -¨*e* plural endings. In addition, groups 1 and 2 may also have -*e,* -¨ø, or -¨*er* in the plural. Group 2 has its own node to show the -¨*(e)n* affix that combines only with the group 2 singular declension. The weak nouns have only -*(e)n* (encompassing both groups 4 and 5); the weak node serves as a second parent node for group 2, as this plural ending is also found in group 2. Note that in this case of multiple inheritance, the primary parent node for 2 is the 1/2 node; it inherits only the phonological form from WEAK, not weak noun status.

The association of gender with the plural endings varies throughout the ENHG corpus[23]. Most are found on nouns of all genders; notable exceptions are the -¨*e* plural, which is not found on neuter nouns, and -¨*er*, which is not used for feminine nouns. (Wegera 1987:82) As is the case in Wegera's corpus, there is no clear link between plural form and gender in the nouns in the passages of the Luther Bible to which I have referred (cf. p. vi).

[23] In Wegera's corpus, which does not include Luther's Bible.

Chapter 6
Koine Greek

1. Introduction

In this chapter, I will deal with Koine Greek of the New Testament. The Koine is the descendant of Attic Greek, incorporating influence of the Ionic dialect. While the Attic dialect preserved archaic features, e.g. the dual number, Ionic lost many of these, resulting in simpler forms in the Koine. (Horrocks 1997:27-9) The Koine was the official language under Macedonian rule, i.e. from the fourth century BCE to 31 BCE, and came to be used throughout the Hellenistic world. (Horrocks 1997:33, 36-7) Later, under the Roman empire, it continued as a spoken language, while Attic was the preferred literary language. An exception to this is popular works such as the New Testament. (Horrocks 1997:70)

The Koine distinguishes five cases: nominative, vocative, genitive, dative, and accusative. Singular and plural number are distinguished morphologically. There are three grammatical genders: masculine, feminine, and neuter; as in the other languages discussed so far, the neuter is the most underspecified due to its consistent syncretism. (Moulton 1955:17) Koine Greek has a total of three declensions. The first two (*α*-stems and *o*-stems, respectively) can be grouped together due to common inflections (group I below), while group II represents the third declension (all other stem classes):

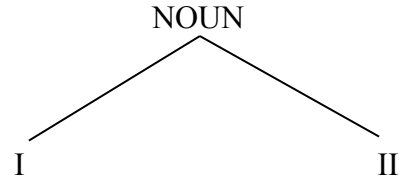

Fig. 6.1

Fig. 6.2 illustrates the suffixes that are common to all nouns:

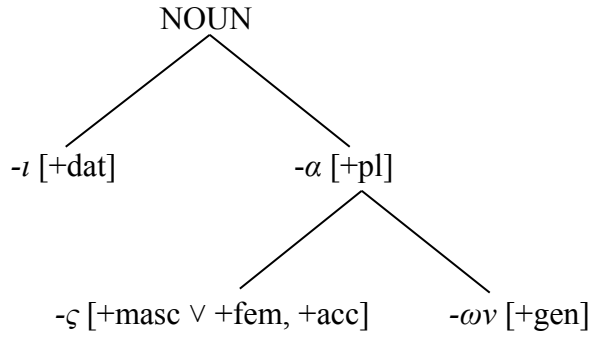

Fig. 6.2

In the dative singular, all nouns have *-ι*, which may occur alone as a suffix or combine

with another vowel in the form of a full vowel or *ι* subscript. The default nominative plural form (i.e. the neuter plural) is -*α*. The genitive plural is consistently -*ων* and the masculine and feminine accusative plural forms have -*ς* preceded by a thematic vowel. Further, the neuter nominative and accusative forms are always homophonous regardless of number. The vocative singular form is often homophonous with the nominative singular (the vocative is only specified on the trees below if a distinct form exists); in the plural, the two are always homophonous.

2. First and Second Declensions

The first and second declensions refer to the *α*-stems and *o*-stems, respectively (as in Latin). The following suffixes are common to both declensions, in addition to those outlined on the NOUN tree above:

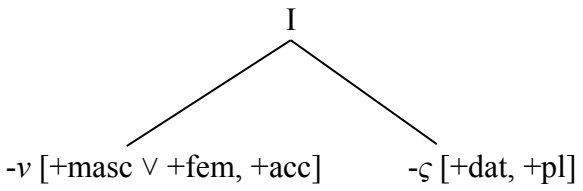

Fig. 6.3

Thus, masculine and feminine nouns belonging to these stem classes have final -*ν* in the accusative singular, and all have -*ς* in the dative plural. Both of these are codas preceded by a thematic vowel.

Fig. 6.4 below shows the subtypes pertaining to each stem class. In the first declension, the masculine and feminine nouns decline differently (there are no neuter nouns in this class). In the second declension, masculine and feminine nouns decline alike, but are set apart from the neuter nouns. Since the neuter gender is underspecified, there are no endings specific to second declension neuter nouns; rather, they are subsumed under those specified for masculine/feminine, as will be shown below.

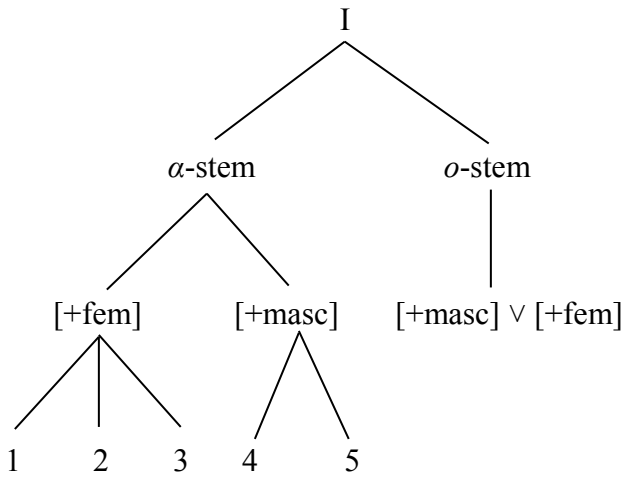

Fig. 6.4

2.1. *α*-stems (First Declension)

The following tree displays the endings common to all first declension (*α*-stem) nouns. Due to variation in the singular forms, all of the following are plural:

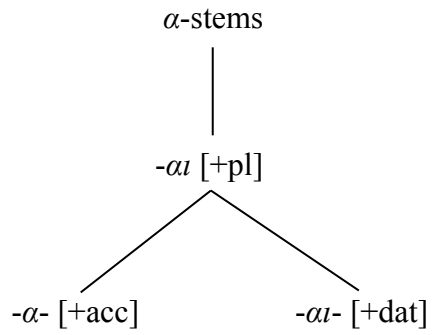

Fig. 6.5

The nominative plural ending is consistently -*αι*. To the codas specified in Fig. 6.3, one adds the thematic vowels -*α*- to the accusative plural and -*αι*- to the dative plural, yielding -*ας* and -*αις*, respectively. To add to the morphological information given so far, Fig. 6.6 provides the suffixes (or codas of suffixes to be completed later) that are specific to each gender:

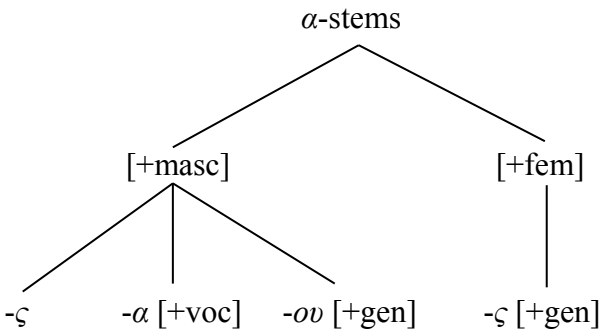

Fig. 6.6

The masculine nouns of the first declension are characterized by final -ς in the nominative singular, as well as a distinct vocative singular form in -α. The genitive singular form matches that of the second declension (see below), namely -ου. The only suffix to consistently mark feminine nouns is the genitive singular -ς. (Moulton 1955:18) The α-stem suffixes are summarized on the inheritance tree below.

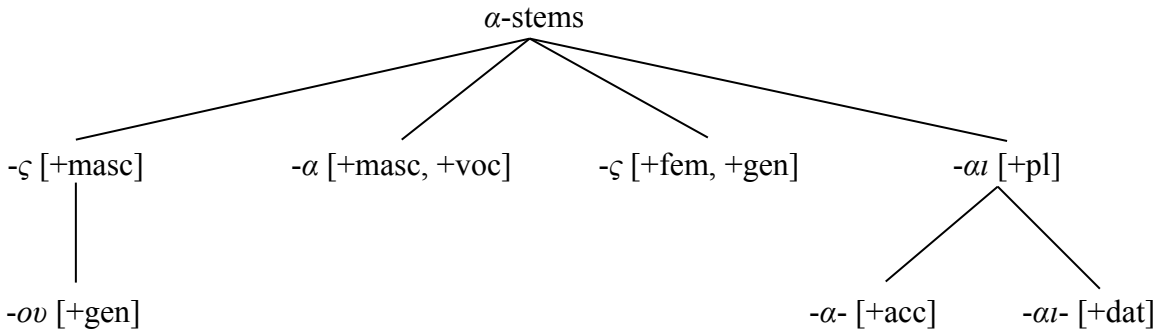

Fig. 6.7

The thematic vowels accompanying the consonantal endings given above, as well as the various vocalic nominative singular endings, follow five different patterns (three for feminine and two for masculine nouns). These are provided on the inheritance trees below. For reasons of space, the feminine and masculine nodes are treated separately.

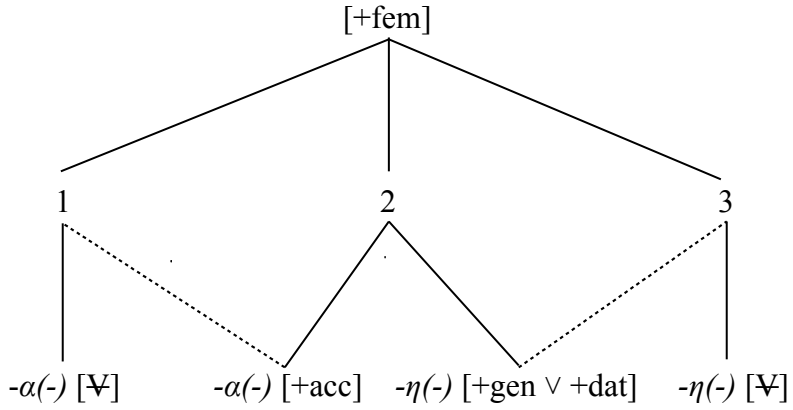

Fig. 6.8

Note that for all first declension nouns, the nominative and accusative share the same thematic vowels. Group 1 is characterized by the thematic vowel *-α(-)*, which is found in all cases in the singular. The vowel recurs as a thematic vowel when a coda is inherited; otherwise it is the ending (i.e. in the nominative singular). Likewise, group 3 has *-η(-)* in all cases. Group 2 is intermediate, inheriting *-α(-)* in the nominative and accusative from group 1 and *-η(-)* in the genitive and dative from group 3. The two masculine declension types are given below:

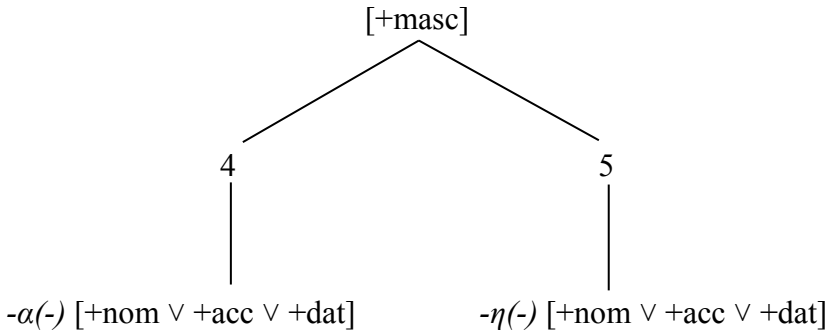

Fig. 6.9

The masculine groups are, like the feminine groups 1 and 3, characterized by a consistent thematic vowel: *-α(-)* in group 4 and *-η(-)* in group 5. These vowels are found in the nominative, accusative, and dative singular (the vocative and genitive forms are accounted for above, cf. Fig. 6.6).

2.2. *o*-stems (Second Declension)

In addition to the endings inherited from the NOUN tree and those shared with the first declension (Figs. 6.2 and 6.3, respectively) , the following endings are common to all Koine Greek *o*-stem nouns:

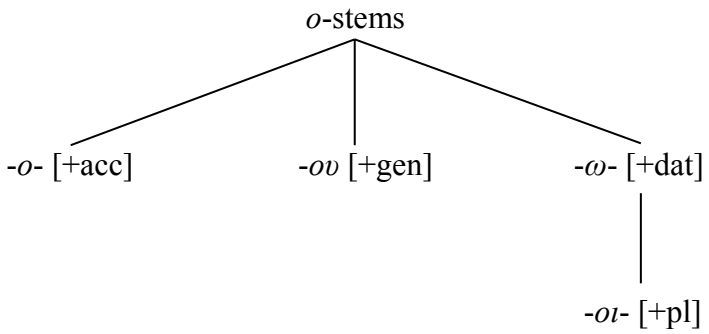

Fig. 6.10

The genitive singular ending is -*ου*; additionally, the accusative singular adds -*o*- to the inherited ending -*ν*. To the inherited -*ς* of the dative plural, the second declension adds -*οι*-. The dative singular -*ι*, common to all stem classes, manifests itself as an *ι* subscript in this instance (under *ω,* thus *ῳ*). As mentioned earlier, masculine and feminine forms are declined alike, while the neuter forms (i.e. nominative/accusative homophony and plural -*α*) are accounted for in Fig. 6.10 above, in addition to the parent nodes from which Fig. 6.10 inherits. The following tree provides the forms specific to masculine and feminine nouns of the second declension:

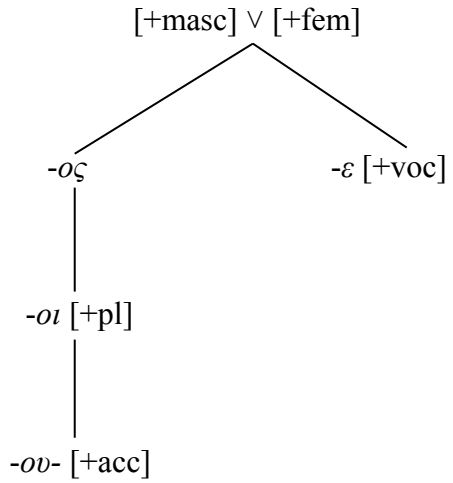

Fig. 6.11

The nominative singular suffix is -*ος*, and in this stem class, there is a separate masculine and feminine vocative form, namely -*ε*. The nominative plural ends in -*οι*. In the accusative plural, -*ου*- is added to the inherited -*ς*. The tree below summarizes the desinences for this declension:

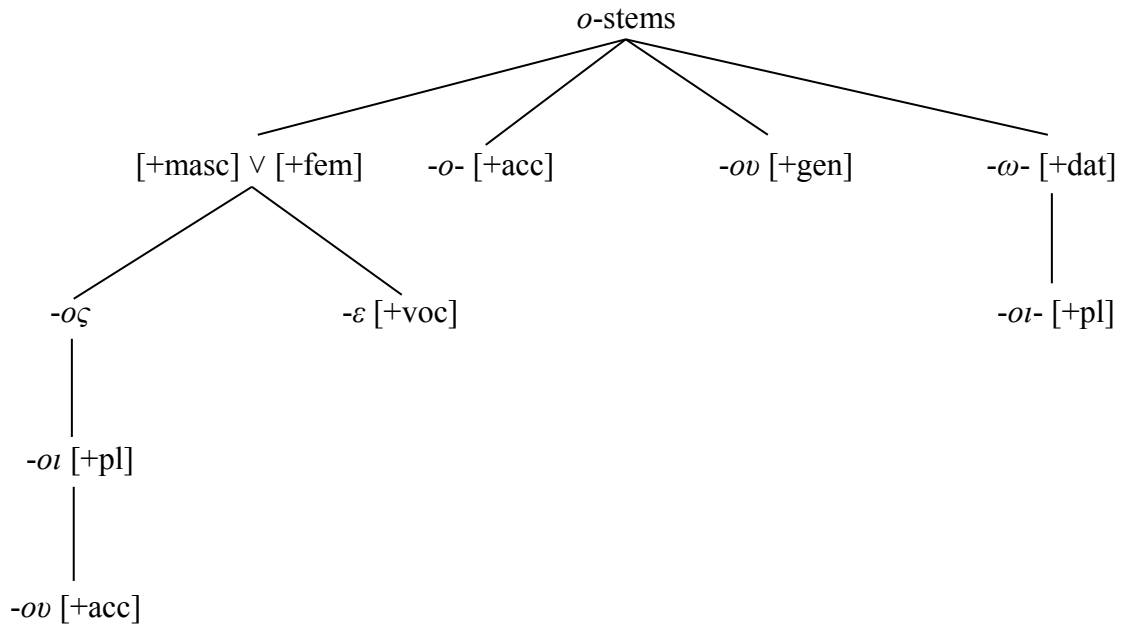

Fig. 6.12

3. Third Declension

In Koine Greek, the remaining nouns not declined like those of first or second declensions are grouped into the third declension, which subsumes numerous historical stem classes. This declension has a major division between nouns with consonantal stems and those with vocalic stems. Vocalic stems are further divided based on gender: masculine and feminine nouns are set apart from neuter nouns. Fig. 6.13 below depicts this hierarchy:

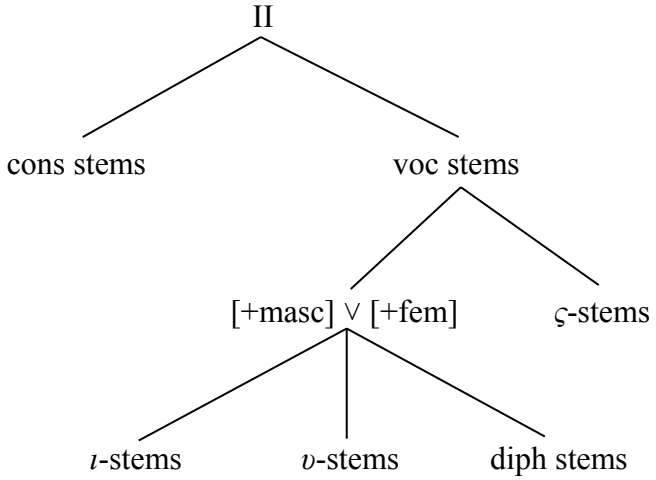

Fig. 6.13

Note that the nominative singular form of a noun is not sufficient to determine the stem; instead, it is reliably apparent in the oblique forms. For example, the neuter noun *πνευμα* 'spirit'

has a consonantal stem, namely *πνεῦματ-*, as evinced by the genitive form *πνεύματος*, despite the fact that the *-τ-* is not found in the noun's least marked case.

The tree below provides the desinences common to all nouns of the third declension:

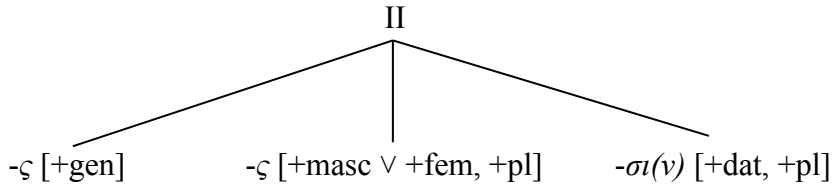

Fig. 6.14

The genitive singular and masculine and feminine nominative plural forms are marked by *-ς*, The dative plural is *-σι(ν)*, setting it apart from the first and second declensions. I have elected to exclude the nominative forms belonging to this declension (as I have done with the Latin third declension) due to the wide variety that exists.

3.1. Consonantal Stems

In addition to the affixes and codas inherited from Fig. 6.14, nouns with consonantal stems add the following phonological material:

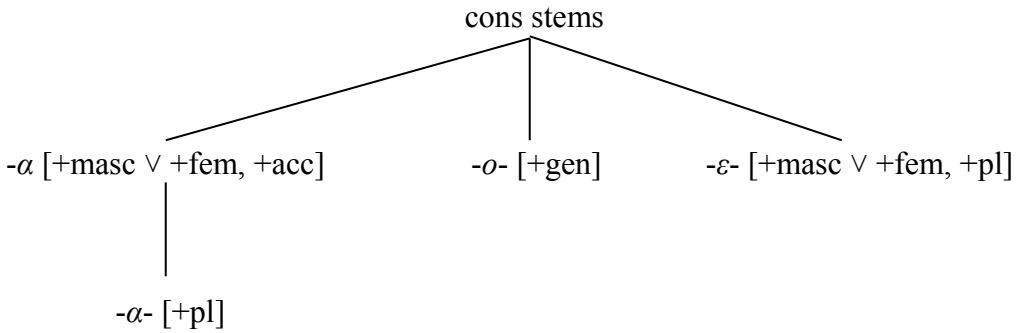

Fig. 6.15

Masculine and feminine nouns have *-α* in the accusative. (As previously mentioned, neuter nouns are homophonous in the nominative and accusative, regardless of number.) The genitive singular adds *-ο-* to the inherited *-ς*, yielding *-ος*. The masculine and feminine plural have *-ε-* in the nominative plural before the inherited *-ς*, and the accusative plural adds *-α-* to the *-ς*, yielding *-ες* and *-ας*, respectively.

3.2. Vocalic Stems

The vocalic stems exhibit a different pattern of declension, as outlined on the trees below. I will begin with the three major stem classes predominated by masculine and feminine nouns

(which are declined alike), namely the *ι*-stems, *υ*-stems, and diphthongal (*ευ*-) stems. I will exclude the minor and unproductive diphthongal classes from which no meaningful generalizations can be made. The only ending common to all nouns with vocalic stems is -*ς* in the masculine and feminine nominative singular:

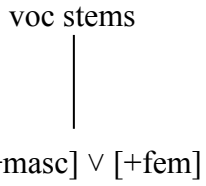

Fig. 6.16

3.2.1. *ι*-stems

The *ι*-stems consist of feminine nouns. The affixes specific to this class are displayed on the tree below:

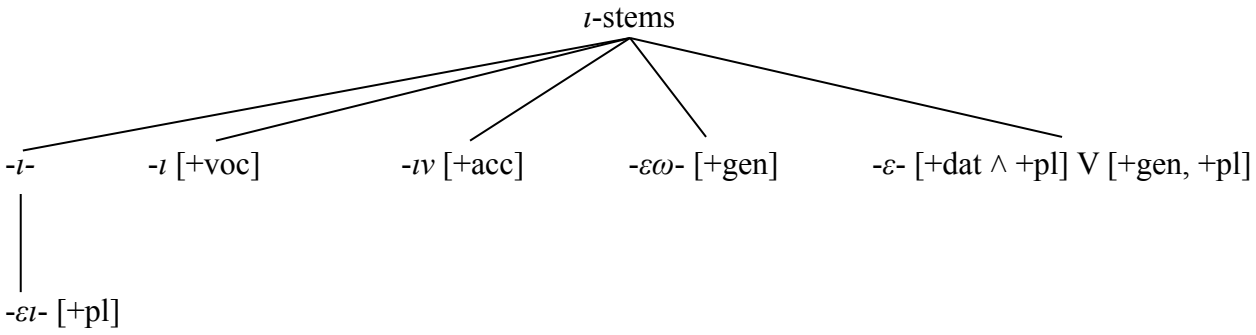

Fig. 6.17

ι-stem nouns are marked by the thematic vowel -*ι*- in the nominative and accusative singular (-*ις* and -*ιν*, respectively). Elsewhere, the thematic vowel is *ε*: the genitive singular coda is preceded by -*εω*-, while the dative singular, dative plural, and genitive plural have -*ε*- prior to the inherited suffixes. The nominative and accusative plural are homophonous in this stem class, adding -*ει*- to the inherited -*ς*. (Moulton 1955:22-3)

3.2.2. *υ*-stems

The *υ*-stem endings are outlined below[24]:

[24] The neuter noun *ἄστυ* 'city' is the only exception to this pattern, declining instead like the neuter *ς*-stems (Fig. 6.20), but with a genitive singular in -*εως*.

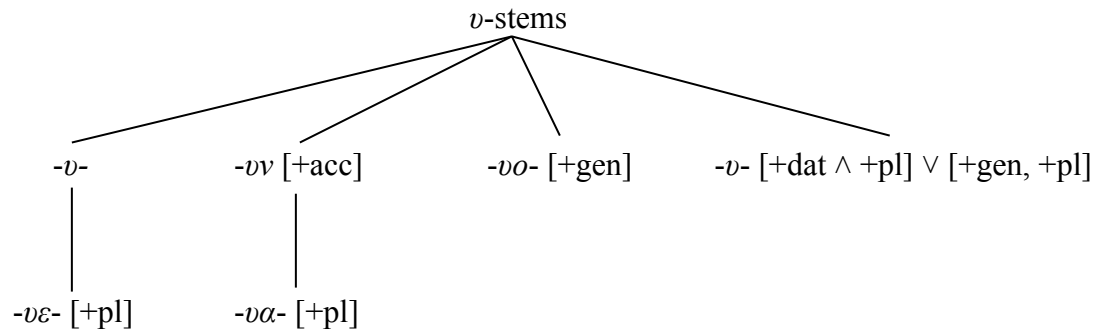

Fig. 6.18

The *υ*-stems are characterized by the thematic vowel *υ*, found throughout the singular forms. The nominative singular desinence adds -*υ*-, while the accusative singular has -*υν*. In the genitive singular, -*υο*- is added to inherited -*ς*; in the dative, the thematic vowel -*υ*- precedes the inherited -*ι*. In the plural, the nominative and accusative forms have -*ε*- and -*α*-, respectively, preceding the inherited coda -*ς* in both cases. The thematic vowel also precedes the inherited genitive and dative plural suffixes. (Moulton 1955:22-23)

3.2.3. Diphthongal Stems

The last group predominated by masculine and feminine nouns is the diphthongal stems. Of these, I will discuss those in -*ευ*-: while the other diphthongal stem classes are small, these were a productive class in Attic. (Buck 1933:201-2)

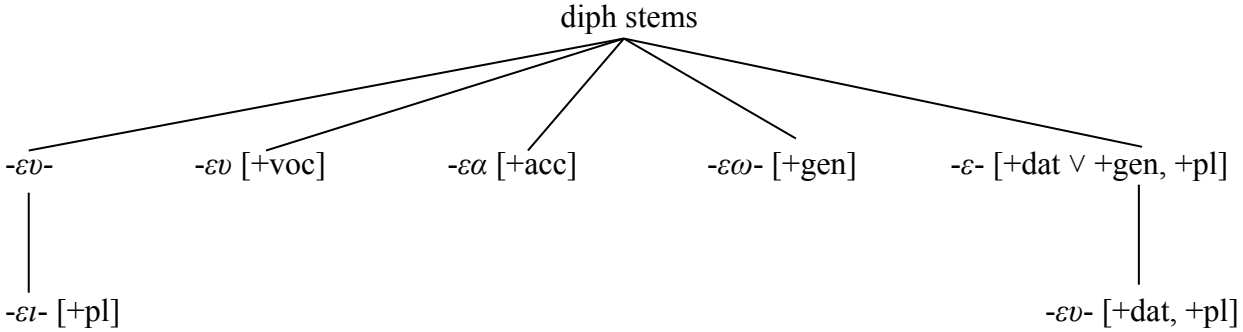

Fig. 6.19

As in the previous two stem classes, the thematic vowel (here, the diphthong *ευ*) is found in the nominative singular. Unlike the *ι*-stem and *υ*-stem pattern, the accusative singular suffix is -*εα*. As in the *υ*-stems, the genitive singular adds -*εω*-, and the dative singular thematic vowel is -*ε*-, which is found also in the genitive plural. The dative plural thematic vowel, however, is the full diphthong -*ευ*-. As is the case for the *ι*-stems, the nominative and accusative plural forms are homophonous, and the vocalic portion of the ending is the same, namely -*ει*-.

3.2.4. ς-stems

The following tree shows the suffixes pertaining to the ς-stems. Due to the loss of intervocalic -ς- in Greek, this group became a vocalic stem class. Unlike the previously discussed vocalic classes, the ς-stems are predominantly neuter. (Moulton 1955:22, Buck 1933:132-3)

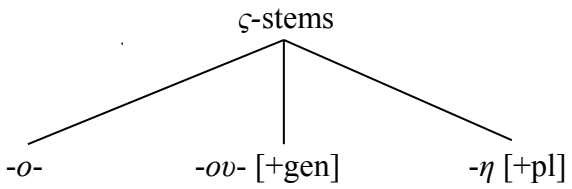

Fig. 6.20

Thus, the nominative singular adds -*ο*- to the inherited -ς, while the genitive singular adds -*ου*- to the inherited -ς, yielding -*ος* and -*ους*, respectively. Further, the nominative and accusative plural form in this group of nouns differs from the expected -*α*, and is instead -*η*.

Chapter 7
Contrastive Morphology

1. Introduction

In this chapter, I compare the morphology as shown on the inheritance trees of Old High German (Chapter 3), Latin (Chapter 4), Early New High German (Chapter 5), and Greek (Chapter 6). I will first compare the languages whose texts form pairs: Old High German and Latin; and Early New High German and Koine Greek. Further, I compare Old High German and Early New High German, examining the diachronic changes. Latin and Greek are then compared as representatives of older forms of the text.

Common to all four languages is the underspecification of the neuter gender. In each stem class, the neuter displays a greater degree of homophony than do the masculine and feminine due to the consistent homophony in the nominative and accusative. As a result, the neuter inflections (with the exception of the nominative and accusative plural ending in Latin and Greek, which is specified early on a high node) are subsumed on other trees, typically with the masculine.

2. Old High German and Latin

Old High German and Latin differ greatly in their major divisions of the morphology. In OHG, the stem classes are classified as strong or weak, each of which has distinct characteristics (i.e. desinences), while Latin nouns can be grouped into two less sharply divided declensional patterns (corresponding to the nodes I and II). The Latin *ē*-stems have two parent nodes, while the OHG classes do not show multiple inheritance. Latin has five declensions (with some variation in the third declension, forming at most six different patterns of inflection); OHG, on the other hand, has eleven major inflectional patterns. The number of endings common to all stem classes varies: OHG has two (the dative plural and genitive plural), while Latin has four (the accusative singular, neuter nominative and accusative plural, masculine and feminine accusative plural, and genitive plural).

Both languages show some predictable patterns of syncretism, e.g. the OHG nominative and accusative of strong nouns and the Latin dative and ablative plural in all declensions. Further, thematic vowels are found in both languages (in addition to consonantal declensions). Structurally, however, the inheritance trees of OHG and Latin differ: the OHG trees have a compact appearance relative to the Latin ones, as the Latin trees have a greater number of endings and thus more nodes. While the number of forms specified above the level of the stem class (spread over multiple trees) are largely similar (in OHG, six for masculine and neuter strong nouns, two for feminine strong nouns, ten for masculine and neuter weak nouns, and eight for feminine weak nouns; in Latin, six for group I nouns and eight for group II nouns), the individual stem class trees show different numbers: in OHG, they range from one node (*a*-stems and *-iz/-az*-stems) to five (*ō*-stems). In Latin, on the other hand, they range from six (*ē*-stems) to

eight (*o*-stems).

3. Early New High German and Koine Greek

This pair shows a set of differences similar to those discussed in section 2 above. Like OHG, ENHG (Chapter 5) has a salient division between strong and weak nouns, while Greek (Chapter 6), like Latin, does not. The first and second declensions, however, do form a grouping due to some common endings that set them apart from the third declension. While Koine Greek has only three main inflectional classes (incorporating some subclasses, yielding up to eleven total), ENHG has eighteen main classes (up to 21, if regional forms are considered). (Wegera 1987, cf. Chapter 5, section 1 above) ENHG has only one ending common to all classes (the dative plural), while Greek has four (dative singular, neuter nominative and accusative plural, masculine and feminine accusative plural, and the genitive plural).

The most striking contrast between ENHG and Greek is the degree of syncretism found in each. ENHG has very few distinctive inflectional endings, and some paradigms have the bare root in all singular cases. Greek, on the other hand, shows very little syncretism: homophony is found only in the neuter, as discussed in section 1 above. Given the differences in number of stem classes and syncretism within them, the trees are unsurprisingly different in structure. The ENHG nouns are divided into subgroups, each with few singular forms on their trees and, in the strong declensions, numerous possible plural endings; the Greek trees, however, have a large number of different desinences shown on each tree for all cases, genders, and numbers.

4. Old High German and Early New High German

An advantage of the inheritance tree format over traditional paradigms is the ability to reflect diachronic changes in a single language. The contrast between the two stages of the German language analyzed here, OHG and ENHG, illustrates this. Beginning in the OHG period, German drift included the weakening of unstressed vowels. The *Tatian* corpus retains full vowels in inflectional endings, resulting in a greater variety of possible inflections (e.g. via thematic vowels). ENHG, by contrast, has far fewer possible endings, and if a vowel is present, it is typically unstressed *e* or *i*[25]. This increase in syncretism is reflected visually in the structure of the respective trees[26]: fewer nodes (and therefore forms) are needed for ENHG than for OHG. Further, the lowest nodes on the OHG trees frequently consist of thematic vowels that form parts of endings; the division into syllable peak and coda is not needed in ENHG.

Additionally, the division between strong and weak nouns is preserved from OHG to ENHG, and remains identified by the *-n* suffix in the singular oblique cases and the plural. The remaining consonantal endings, i.e. the masculine and neuter genitive singular *-s* (originally an *a*-stem suffix) and the dative plural nasal (usually *-n* in the Tatian corpus) are found in both stages. The status of the dative plural as common to all nouns is reflected in its specification at

[25] Unstressed *i* is common in Luther's Bible; cf. Chapter 5, note 1.

[26] The division of ENHG classes into five subgroups obscures this to some extent; no more than three categories are specified for each subgroup, though multiple plural endings are possible for some subgroups.

the highest node (NOUN) in both OHG and ENHG. In ENHG, this is the only desinence common to both strong and weak nouns; OHG also has the genitive plural *-o* in all classes. The proliferation of combinations of singular declensions and possible plural endings reflect an increase in the number of inflectional classes in ENHG (an increase from eleven major classes to eighteen).

5. Latin and Koine Greek

Latin and Koine Greek have structurally similar trees. Both have a comparatively large number of nodes due to a) the greater number of cases than German and b) less leveling among them. The number of inflectional classes is also comparable: five declensions in Latin and three main declensions in Greek (with some subgroups). These classes fall into two general patterns in both languages.

6. Summary

The chief advantage of the inheritance tree framework is its ability to depict linguistic generalizations. By grouping stem classes according to morphological commonalities, the inflectional patterns may be clearer to the learner or translator. Moreover, the trees focus on synchronic description over diachronic classification, yet also enable diachronic comparison. The trees provide an alternative to the list format of traditional paradigms.

As has been shown, the trees vary structurally according to the structure of the individual language's morphology. A larger number of possible desinences yields a larger number of nodes; syncretism in the paradigm may yield disjunctive nodes and thus interfere with the lines of inheritance (cf. Fig 4.9, in which the genitive singular and plural are split due to disjunction). An ideal tree would contain no syncretism and would be fairly compact, but natural language rarely behaves this way. ENHG presents a particular challenge in that its eighteen major classes consist of a mix-and-match pattern of the five singular declensions with seven potential plural endings, rendering some repetition among trees inevitable. In the remaining three languages, thematic vowels attached to common consonantal endings call for the morphemes to be split into peak and coda; while not an ideal representation, this allows generalizations among declensions and class-specific characteristics to be shown. On the whole, none of the above representations can be considered ideal; due to the complicated nature of language, the implementation of inheritance requires compromise.

Chapter 8
Conclusion

The inheritance framework, originating in the field of artificial intelligence, has a variety of potential applications. While initially a means of representing mainly semantic properties, it lends itself well to other types of linguistic description. There are several types of inheritance, e.g. monotonic and multiple. Default inheritance, which allows subnodes to override properties of their parent nodes, was chosen as best suited for this purpose (cf. Chapter 2). Inheritance plays a key role in numerous recent linguistic theories, e.g. Network Morphology (Corbett and Fraser 1993) and Minimalist Morphology (Wunderlich and Fabri 1995; Wunderlich 1995, 1997, 1999, 2003). Further, it is employed in the DATR language (Evans and Gazdar 1996), which functions similarly to the tree model.

In the subsequent four chapters, I apply this framework to four older languages: Old High German (Chapter 3), Latin (Chapter 4), Early New High German (Chapter 5), and Koine Greek (Chapter 6). The choice of languages originates from two pairs of biblical translations: the OHG and Latin *Tatian*; and Luther's ENHG Bible and the Greek New Testament. The parallel passages, along with grammars of each language, serve as the sources of the morphological data; in instances of variation, the texts confine the data to a single dialect and era. Further, these pairs of languages provide the basis for linguistic contrast in Chapter 7.

In the analysis chapters, I have outlined the inflectional morphology on inheritance trees, beginning with the hierarchy of all inflectional classes. The trees to follow both capture generalizations across all paradigms and provide morphological information specific to each stem class. The generalizations are found early in each chapter, corresponding to the highest nodes on the overarching tree. The most specific forms are to be found on the lowest nodes, indicating that they are not inherited by another group. Where applicable, e.g. where multiple possible variants exist, the forms provided are drawn from the corpus. In instances of syncretism, i.e. where a single form has multiple functions, disjunctive ("or") statements are used wherever possible in order to condense repeat forms into a single node. While default inheritance is the preferred type, I have also employed multiple inheritance when it best accounts for the data.

Chapter 7 summarizes the analysis from a contrastive perspective. It shows that the inheritance tree structure is revealing of differences in linguistic structure. Factors such as the number of nodes and number (and type) of properties associated with them reflect syncretism, loss of categories, or lack thereof. Additional factors include clear divisions between inflectional patterns vs. multiple inheritance (the latter indicates overlap between paradigms rather than sharp divisions in declensional types). For example, the Latin and Greek trees contain, on average, more nodes than their OHG and ENHG counterparts: the former thus have a greater number of possible forms, due to a greater number of cases in Latin and very little syncretism in Greek. Conversely, the German trees reflect paradigmatic leveling, and the contrast between OHG and ENHG is also evident from tree structure, as the sparse ENHG trees reflect the merger of unstressed vowels and the subsequent syncretism.

A goal of this study is to aid the translator working with the pairs of texts that comprise my corpus. As the tree analysis shows, the language pairs – OHG and Latin (Chapters 3 and 4), ENHG and Greek (Chapters 5 and 6) – differ significantly in their structure. It is hoped that the trees will allow for an easier visual reference than traditional paradigms through their focus on the suffixes. The incorporation of inheritance trees into grammars (as in Rauch 2003) would thus be a useful application. Potential future work may include application of inheritance to the inflectional morphology of the stages of German which have not yet been analyzed in this way, i.e. Middle High and New High German; other older Germanic languages, e.g. Old Norse and Old Saxon; and completion of the inflectional morphology analysis above by including verbs and adjectives. As I have shown, inheritance trees play a dual role of depicting the structure of a language and functioning on a practical level for the language learner.

Bibliography

Blevins, James P. 1995. Syncretism and paradigmatic opposition. *Linguistics and Philosophy* 18.113-52.

Brachman, Ronald J. "I lied about the trees" or, Defaults and definitions in knowledge representation. *AI Magazine* 6.80-93.

Braune, Wilhelm. 1994. *Althochdeutsches Lesebuch*. 17th ed., ed. by Ernst A. Ebbinghaus. Tübingen: Max Niemeyer.

Braune, Wilhelm. 2004. *Althochdeutsche Grammatik I*. 15th ed., ed. by Ingo Reiffenstein. Tübingen: Max Niemeyer.

Buck, Carl Darling. 1933. *Comparative grammar of Greek and Latin*. Chicago: The University of Chicago Press.

Cahill, Lynne, and Gerald Gazdar. 1999. German noun inflection. *Journal of Linguistics* 35.1-42.

Corbett, Greville G. 1982. Gender in Russian: An account of gender specification and its relationship to declension. *Russian Linguistics* 6.197-232.

Corbett, Greville G., and Norman M. Fraser. 1993. Network Morphology: a DATR account of Russian nominal inflection. *Journal of Linguistics* 29.113-42.

Daelemans, Walter; Koenraad De Smedt; and Gerald Gazdar. 1992. Inheritance in natural language processing. *Computational Linguistics* 18.205-218.

Etherington, David W., and Raymond Reiter. 1983. On inheritance hierarchies with exceptions. *AAAI-83,* 104-108.

Evans, Roger, and Gerald Gazdar. 1996. DATR: A language for lexical knowledge representation. *Computational Linguistics* 22.167-216.

Fabri, Ray; Christof Rumpf; Martina Urbas; and Markus Walther. 1995. A computational model of Minimalist Morphology. *Theorie des Lexikons: Arbeiten des Sonderforschungsbereichs 282*, Nr. 62. Düsseldorf: University of Düsseldorf.

Fahlman, Scott. 1979. *NETL*: *A system for representing and using real-world knowledge.* Cambridge, MA: The MIT Press.

Flickinger, Daniel; Carl Pollard; and Thomas Wasow. 1985. Structure-sharing in lexical representation. *Proceedings of the 23rd annual meeting of the association for*

computational linguistics, 262-7. Morristown, NJ: Association for Computational Linguistics.

Fraser, Norman M., and Richard A. Hudson. 1992. Inheritance in Word Grammar. *Computational Linguistics* 18.133-58.

Gazdar, Gerald. 1987. Linguistic applications of default inheritance mechanisms. *Linguistic theory and computer applications*, ed. by P.J. Whitelock et al. London: Academic Press, 37-67.

Greenough, J. B., and J. H. Allen. 2001. *Allen and Greenough's new Latin grammar*, ed. by Anne Mahoney. Newburyport, MA: Focus Publishing.

Hippisley, Andrew. 2001. Word formation rules in a default inheritance framework: a Network Morphology account of Russian personal nouns. *Yearbook of Morphology 1999*, ed. by Geert Booij and Jaap van Marle, 221-61. Dordrecht: Kluwer Academic Publishers.

Horrocks, Geoffrey C. 1997. *Greek: A history of the language and its speakers*. New York: Longman.

Karttunen, Lauri. 1984. Features and values. *COLING '84: Proceedings of the 10th international conference on computational linguistics*, 28-33.

Kilbury, James. 1999. German noun inflection revisited. *Journal of Linguistics* 37.339-53.

Lieb, Hans-Heinrich. 2005. Notions of paradigm in grammar. *Lexikologie / Lexicology: Ein internationales Handbuch zur Natur und Struktur von Wörtern und Wortschätzen / An international handbook on the nature and structure of words and vocabularies*, Vol. 2, ed. by D. Alan Cruse, Franz Hundsnurscher, Michael Job, and Peter Lutzeier, 1613-46. Berlin: de Gruyter.

Luther, Martin. 2001. *D. Martin Luthers Werke: Kritische Gesamtausgabe. Deutsche Bibel, 1522-1546.* Vol. 6. Weimar : H. Böhlaus Nachfolger.

Meyer, Bertrand. 1997. *Object-oriented software construction*. 2nd ed. Upper Saddle River, NJ: Prentice Hall.

Moulton, James Hope. 1955. *An introduction to the study of New Testament Greek.* 5th ed., ed. by Henry G. Meecham. New York: Macmillan.

Müller, Gereon. 2004. On decomposing inflection class features: Syncretism in Russian noun inflection. *Explorations in nominal inflection*, ed. by Gereon Müller, Lutz Gunkel, and Gisela Zifonun, 189-227. Berlin: Mouton de Gruyter.

Penzl, Herbert. 1984. *Frühneuhochdeutsch*. New York: Peter Lang.

Pollard, Carl, and Ivan Sag. 1987. *Information-based syntax and semantics.* Vol. 1. Stanford, CA: Center for the Study of Language and Information.

Quillian, M. 1968. Semantic memory. *Semantic information processing*, ed. by Marvin Minsky, 227-70. Cambridge, MA: The MIT Press.

Rauch, Irmengard. 1991. Early New High German *e*-plural. *Beiträge zur Geschichte der deutschen Sprache und Literatur* 113.367-83.

Rauch, Irmengard. 2003. *The Gothic language: Grammar, genetic provenance and typology, readings.* New York: Peter Lang.

Steins, Carsten. 1998. Against arbitrary features in inflection: Old English declension classes. *Phonology and morphology of the Germanic languages*, ed. by Wolfgang Kehrein and Richard Wiese, 241-265. Tübingen: Max Niemeyer.

The Greek New Testament, ed. from ancient authorities, with their various readings in full, & the Latin version of Jerome. 1857-1861. Vols. 1 and 2, ed. by Samuel Prideaux Tregelles. London: Samuel Bagster & Sons.

Wegera, Klaus-Peter. 1987. *Grammatik des Frühneuhochdeutschen*, ed. by Hugo Moser, Hugo Stopp, and Werner Besch. Vol. 3: Flexion der Substantive. Heidelberg: Carl Winter.

Wunderlich, Dieter. 1996. Minimalist morphology: the role of paradigms. *Yearbook of morphology 1995,* ed. by Geert Booij and Jaap van Marle, 93-114. Dordrecht: Kluwer Academic Publishers.

Wunderlich, Dieter. 1997. Der unterspezifizierte Artikel. *Sprache im Fokus: Festschrift für Heinz Vater zum 65. Geburtstag*, ed. by Christa Dürscheid, Karl Heinz Ramers, and Monika Schwarz, 47-55. Tübingen: Max Niemeyer.

Wunderlich, Dieter. 1999. The German noun plural reconsidered. Düsseldorf: University of Düsseldorf, MS. Online: http://user.phil-fak.uni-duesseldorf.de/~wdl/Nplural.pdf.

Wunderlich, Dieter. 2003. A minimalist view on inflectional paradigms: the expression of person and number in subjects and objects. Düsseldorf: University of Düsseldorf, MS. Online: http://user.phil-fak.uni-duesseldorf.de/~wdl/min-view2.pdf.

Wunderlich, Dieter, and Ray Fabri.1995. Minimalist Morphology: An approach to inflection. *Zeitschrift für Sprachwissenschaft* 14.2.236-94.

Appendix

The paradigms below reflect the information from the trees in chapters 3-6; they do not necessarily represent the multitude of possible endings that are attested.

1. Old High German

Strong Nouns: Masculine/neuter declensions

a-stems

	M		N	
	SING	PL	SING	PL
Nom	tag	taga	wort	wort
Gen	tages	tago	wortes	worto
Dat	tage	tagun/tagon	worte	wortun/worton
Acc	tag	taga	wort	wort
Inst	tagu/tago		wortu/worto	
	'day'		'word'	

ja-stems

	M		N	
	SING	PL	SING	PL
Nom	hirti	hirta	cunni	cunnu[27]
Gen	hirtes	hirto	kunnes	kunno
Dat	hirte	hirtin	cunne	kunnin
Acc	hirti	hirta	cunni	cunnu
Inst	hirtu/hirto		kunnu/kunno	
	'shepherd'		'lineage'	

wa-stems

	M		N	
	SING	PL	SING	PL
Nom	hlēo	hlēwa	horo	horo
Gen	hlēwes	hlēwo	hor(o/a/e)wes	hor(a)wo
Dat	hlēwe	hlēwun/hlēwon	horowe	horawun/horawon
Acc	hlēo	hlēwa	horo	horo
	'grave'		'dirt'	

[27] In *Tatian*, the *c*- spelling is used; because the paradigm is incomplete in the corpus, it is completed as in Braune (2004:189) using the variants found elsewhere in *Tatian*.

	-iz-/-az-stems		*u*-stems	
	SING	PL	SING	PL
Nom	lamb	lembir	situ	siti
Gen	lambes	lembiro	sites	sit(e)o
Dat	lambe	lembirun/lembiron	site	sitin
Acc	lamb	lembir	situ	siti
Inst	lambu/lambo		sit(i)u	
	'lamb'		'custom'	

Feminine declensions

	ō-stems		*jō*-stems (otherwise like *ō*-stems)	
	SING	PL	SING	PL
Nom	geba	gebā	kuningin	kuninginna
Gen	gebu	gebōno	kuninginna	kuninginnōno
Dat	gebu	gebōn/gebon	kuninginnu	kuninginnōn
Acc	geba	gebā	kuninginna	kuninginna
	'gift'		'queen'	

i-stems

	SING	PL	SING	PL
Nom	anst	ensti	gast	gesti
Gen	ensti	ensto	gastes	gesto
Dat	ensti	enstin	gaste	gestin
Acc	anst	ensti	gast	gesti
Inst			gastu	
	'favor'		'guest'	

Weak Nouns: Masculine/neuter declensions

	M		N	
	SING	PL	SING	PL
Nom	hano	hanon	herza	herzun
Gen	hanen	hanōno	herzen	herzōno
Dat	hanen	hanōn	herzen	herzōn
Acc	hanon	hanon	herza	herzun
	'rooster'		'heart'	

Feminine declensions

	ōn-stems		*īn*-stems	
	SING	PL	SING	PL
Nom	zunga	zungūn	hohī(n)	hohī(n)
Gen	zungūn	zungōno	hohī(n)	hohīno
Dat	zungūn	zungōn	hohī(n)	hohīn
Acc	zungūn	zungūn	hohī(n)	hohī(n)
	'tongue'		'height'	

2. Latin

ā-stems

	SING	PL
Nom	via	viae
Gen	viae	viārum
Dat	viae	viīs
Acc	viam	viās
Abl	viā	viīs
	'road'	

o-stems

	M		N	
	SING	PL	SING	PL
Nom	lupus	lupī	iugum	iuga
Gen	lupī	lupōrum	iugī	iugōrum
Dat	lupō	lupīs	iugō	iugīs
Acc	lupum	lupōs	iugum	iuga
Abl	lupō	lupīs	iugō	iugīs
Voc	lupe			
Loc	humī			
	'wolf' /(loc. 'earth')		'yoke'	

ē-stems

	SING	PL
Nom	rēs	rēs
Gen	rei	rērum
Dat	rei	rēbus
Acc	rem	rēs
Abl	rē	rēbus
Loc	diē	
	'thing' /(loc. 'day')	

Third declension: *i*-stems

	M/F		N	
	Sing	Pl	Sing	Pl
Nom	turris	turrēs	mare	maria
Gen	turris	turrium	maris	marium
Dat	turrī	turribus	marī	maribus
Acc	turrem	turrēs	mare	maria
Abl	turre	turribus	marī	maribus
	'tower'		'sea'	

Consonantal stems

	M/F		N	
	Sing	Pl	Sing	Pl
Nom	pēs	pedēs	caput	capita
Gen	pedis	pedum	capitis	capitum
Dat	pedī	pedibus	capitī	capitibus
Acc	pedem	pedēs	caput	capita
Abl	pede	pedibus	capite	capitibus
	'foot'		'head'	

u-stems

	M/F		N	
	Sing	Pl	Sing	Pl
Nom	tribus	tribūs	genu	genua
Gen	tribūs	tribuum	genūs	genuum
Dat	tribuī	tribibus	genuī	genibus
Acc	tribum	tribūs	genu	genua
Abl	tribū	tribibus	genū	genibus
	'tribe'		'knee'	

3. Early New High German

Group 1

	Sing	Pl	Sing	Pl	Sing	Pl
Nom	Tag	Tage	Gast	Gäste	Wort	Wort
Gen	Tages	Tage	Gast(e)s	Gäste	Wort(e)s	Wort
Dat	Tag(e)	Tagen	Gast(e)	Gästen	Wort(e)	Worten
Acc	Tag	Tage	Gast	Gäste	Wort	Wort
	'day'		'guest'		'word'	

	Sing	Pl	Sing	Pl
Nom	apfel	äpfel	Lamm	Lämmer
Gen	apfels	äpfel	Lamm(e)s	Lämmer
Dat	apfel	äpfel(e)n	Lamm(e)	Lämmer(e)n
Acc	apfel	äpfel	Lamm	Lämmer
	'apple'		'lamb'	

Group 2

	Sing	Pl	Sing	Pl
Nom	sach(e)	sach(e)	Finsternis	Finsternisse
Gen	sach(e)	sach(e)	Finsternis	Finsternisse
Dat	sach(e)	sach(e)n	Finsternis	Finsternissen
Acc	sach(e)	sach(e)	Finsternis	Finsternisse
	'thing'		'darkness'	

	Sing	Pl	Sing	Pl	Sing	Pl
Nom	Stadt	Stätte	Tochter	Töchter	Sach(e)	Sachen
Gen	Stadt	Stätte	Tochter	Töchter	Sach(e)	Sachen
Dat	Stadt	Stätten	Tochter	Töchter(e)n	Sach(e)	Sachen
Acc	Stadt	Stätte	Tochter	Töchter	Sach(e)	Sachen
	'place, city'		'daughter'		'thing'	

	Sing	Pl	Sing	Pl
Nom	muter	mütern	buch	bücher
Gen	muter	mütern	buch	bücher
Dat	muter	mütern	buch	büchern
Acc	muter	mütern	buch	bücher
	'mother'		'book'	

Group 3

	Sing	Pl	Sing	Pl
Nom	stat	stede	zit	zit
Gen	stede	stede	zite	zit
Dat	stede	steden	zite	ziten
Acc	stat	stede	zit	zit
	'place, city'		'time'	

Group 4

	Sing	Pl	Sing	Pl
Nom	Bote	Boten	mensche	mensche
Gen	Boten	Boten	menschen	mensche
Dat	Boten	Boten	menschen	menschen
Acc	Boten	Boten	menschen	mensche
	'messenger'		'person'	

Group 5

	Sing	Pl
Nom	Herz	Herzen
Gen	Herzens	Herzen
Dat	Herzen	Herzen
Acc	Herz	Herzen
	'heart'	

4. Greek

α-stems (Groups 1-5)

	Sing	Pl	Sing	Sing
Nom	ἡμέρα	ἡμέραι	δόξα	φωνή
Gen	ἡμέρας	ἡμέρῶν	δόξης	φωνῆς
Dat	ἡμέρᾳ	ἡμέραις	δόξῃ	φωνῇ
Acc	ἡμέραν	ἡμέρας	δόξαν	φωνήν
	'day'		'glory'	'voice'

	Sing	Sing
Nom	νεανίας	κριτής
Gen	νεανίου	κριτοῦ
Dat	νεανίᾳ	κριτῇ
Acc	νεανίαν	κριτή
Voc	νεανία	κριτά
	'young man'	'judge'

o-stems

	M		N	
	Sing	Pl	Sing	Pl
Nom	λόγος	λόγοι	παιδίον	παιδία
Gen	λόγου	λόγων	παιδίου	παιδίων
Dat	λόγῳ	λόγοις	παιδίῳ	παιδίοις
Acc	λόγον	λόγους	παιδίον	παιδία
Voc	λόγε			
	'word'		'child'	

Third declension: Consonantal stems

	Sing	Pl	Sing	Pl
Nom	ἡγεμών	ἡγεμόνες	πνεῦμα	πνεύματα
Gen	ἡγεμόνος	ἡγεμόνων	πνεύματος	πνευμάτων
Dat	ἡγεμόνι	ἡγεμόσι(ν)	πνεύματι	πνεύμασι(ν)
Acc	ἡγεμόνα	ἡγεμόνας	πνεῦμα	πνεύματα
	'governor'		'spirit'	

Vocalic stems

	ι-stems		υ-stems	
	Sing	Pl	Sing	Pl
Nom	πόλις	πόλεις	ἰχθύς	ἰχθύες
Gen	πόλεως	πόλεων	ἰχθύος	ἰχθύων
Dat	πόλει	πόλεσι(ν)	ἰχθύι	ἰχθύσι(ν)
Acc	πόλιν	πόλεις	ἰχθύν	ἰχθύας
Voc	πόλι		ἰχθύ	
	'city'		'fish'	

	Diphthongal stems		ς-stems	
	Sing	Pl	Sing	Pl
Nom	γραμματεύς	γραμματεῖς	γένος	γένη
Gen	γραμματέως	γραμματέων	γένους	γενῶν/γενέων
Dat	γραμματεῖ	γραμματεῦσι(ν)	γένει	γένεσι(ν)
Acc	γραμματέα	γραμματεῖς	γένος	γένη
Voc	γραμματεῦ			
	'scribe'		'race, kind'	