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  UNIVERSITY OF HAWAII, PH.D., 1979

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A DIACHRONIC VIEW OF CASE-MARKING SYSTEMS IN GREEK:
A LOCALISTIC-LEXICASE ANALYSIS

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE
UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT OF
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MAY 1979

By

Veneeta Acson

Dissertation Committee:

Stanley Starosta, Chairman
Gordon H. Fairbanks
Laurence C. Thompson
Ann M. Peters
Iovanna D. Condax
J. Dennis Ellsworth

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ABSTRACT

This dissertation is an investigation of the case-marking systems of Classical Attic Greek and Standard Modern Demotic Greek. It treats prepositions and nominal inflections as complementary case-marking elements, and analyzes them separately and as single integrated systems within a lexicase framework, a generative, non-transformational syntactic theory. The prepositional, case, declensional, and inflectional systems are viewed from the perspective of the localist hypothesis, which analyzes prepositions and case inflections in terms of 'direction' and 'location'.

In conjunction with the synchronic analysis of case-marking systems, the diachronic rule changes from Classical Attic Greek to Modern Demotic Greek are analyzed systematically stage by stage within the same framework.

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CHAPTER 1

Introduction

1.1 Objectives

This study analyzes the case-marking systems of
Classical Attic Greek (c.500 to 300 B.C.) and standard
Modern Demotic Greek. The case-marking system is expressed
by the nominal inflectional patterns and prepositional
patterns of these two languages. This investigation takes
the descriptive paradigms of traditional grammar and
synthesizes them with the centuries-old 'localist hypo-
thesis' (see Section 1.5) and with a modern formalized
approach to the grammar of language, lexicase (see Section
1.6).

The following areas are included in this analysis:
a) application of the localist hypothesis to the case-
marking systems of Classical Greek and Modern Demotic Greek.
The localist hypothesis analyzes the syntactic and semantic
functions of nouns and prepositions in terms of semantic
components of direction and location. Previous applica-
tions of the localist hypothesis to Greek have been
limited to the oblique cases and portions of the preposi-
tional system of the classical language. Here it will be
extended to the entire prepositional system, together with

the oblique case system, of that period. A parallel
analysis of Modern Greek will also be attempted.

b)   discussion of the case-marking rules in Classical
Greek and Modern Demotic Greek. The diachronic phonologi-
cal changes which affect the prepositional, case, declen-
sional, and nominal inflectional systems of Classical
Greek will be systematized and formalized into rules
within the lexicase framework.

1.2 The languages

This diachronic study spans two millenia. Classical
Attic Greek (CG) includes the years 500 to 300 B.C. Modern
Demotic Greek (MDG) dates from 1453, the fall of Constanti-
nople. However, 1880 is the beginning of the Demotic
movement, the date in which several poets formed a group
writing in the Demotic language, in reaction to the
archaic Katharevusa.

It is important to delimit the dates of the language
being studied due to the difference of usage from one
period to the next. For example, in Homeric Greek (see
Appendix A for Dates of Greek), the dual was used freely,
whereas by Attic Greek times, the dual was dying and was
no longer considered standard for the period. In particu-
lar, the description of the prepositions is strictly
limited in this study to Attic Greek prose, since other
periods often used the prepositions with varying case
inflections never occurring in Attic Greek.

As for Modern Greek, a deliberate attempt is made to analyze the colloquial language, Demotic Greek. The artificial puristic style, 'Katharevusa', has been strictly avoided. Dimotiki (Demotic Greek) is the language of the people, both spoken and in their literature. There are two distinct dialects: standard, which is Athens-based, and a Northern dialect which is found on the Northern mainland, the Northern islands, and in Asia Minor. Only occasional references will be made to the Northern dialect. The differences between the standard and Northern dialects are minor phonological changes, a few syntactic differences, and some lexical distinctions.

1.2.1 Chronology of Greek

Greek dates back thirty centuries, from Homer's epic poetry to present-day Modern Greek literature. However, scholars do not seem to agree on the dating system for the ages or stages of Greek and their corresponding dialects or languages. The summary presented here is a synthesis of the dates according to Jannaris (1968), Smyth (1974), and Paine (1961).

The earliest extant witnesses of Greek are from Mycenean times, which date from 1600 to 1100 B.C. The Dark Ages occur between Mycenean Greek and Homeric Greek, from 1100 to 850 B.C. Homeric Greek (primarily Ionic) is dated from approximately 850 to 700 B.C. The language of the

ensuing years from 700 to 500 B.C. is represented by several

dialects, which include Ionic, Aeolic, Doric, and Attic

(closely related to Ionic). These dialects are also found

in the time of Classical Greece from 500 to 300 B.C., when

Attic Greek became dominant as the standard literary

language due to the superiority of Athens as a political

and cultural center. The Greek from 300 B.C. to A.D. 330 is

known as Koine or Common Greek. Koine refers to the

'popular' form of Attic Greek with some admixture of Ionic

as used in the New Testament. Atticising authors were

those who still tried to write in the 'pure' form of Attic

Greek. The name 'Hellenistic' is sometimes used for this

period in contrast to the preceding 'Hellenic' age, because

the 'Hellenistic' culture was considered to be inferior to

the previous age. The center of learning during this

period was Alexandria, and for that reason this time is

also known as the Alexandrian Age. The Byzantine period,

so named because Byzantium (Constantinople) was the cultural

center, dates from A.D. 330 to 1453. There are two distinct

styles within this period: the vernacular, which is based

on Koine, and the style used by the 'Classicists', who

continued to approximate the 'pure' classical language.

The last four hundred years of this period are sometimes

referred to as the Mediaeval Period. Modern Greek dates

from the fall of the Ottoman Empire in 1453 to the present

DATES	AGES	GREEK
1600-1100 B.C.	Mycenean	Linear B
1100-850 B.C.	Dark Ages	no remains
850-700 B.C.	Homeric	primarily Ionic
700-500 B.C.	Lyric	Archaic/Old Greek Ionic, Aeolic, Doric dialects
500-300 B.C.	Classical	Attic
300 B.C. - A.D. 330	Hellenistic/ Alexandrian	Koine (Common) Atticism
A.D. 330-1453 (1000-1453	Byzantine Mediaeval)	Vernacular Classicism
1453-present	Modern	Dimotiki (Demotic) Katharevusa (Puristic)

Figure 1. Chronology of Greek

day. Now that Demotic Greek (Dimotiki) is allowed to be

taught in the schools (since the Spring of 1976), the

'puristic' language (Katharevusa) is losing its hold as a

standard form of the Greek language.

1.2.2 Transcriptions

Although the writing system for CG and MDG is identi-

cal, the phonemic systems of the two languages are quite

different. The writing system of CG is very close to

phonemic, whereas that of MDG is far from phonemic.

Greek was written with uncial characters in inscrip-

tions and manuscripts well into the ninth century. By the

end of the tenth century the uncials were abandoned in favor

of the minuscule characters which were developed in order to

save space on the page and to write faster. The new script

was more economical in terms of space, time, and cost of

the more expensive parchment (versus the earlier use of the

less expensive papyrus) (Reynolds, 1968).

In this study a transliteration is used, which is best

keyed to the familiar minuscule characters. A list of the

uncial and minuscule characters with the corresponding

transcriptions in CG and MDG is found in Appendix B.

1.2.2.1 Classical Greek

The transcription for CG is a standard (Allen, 1974)

transliteration using the Roman alphabet. The following

correspondences are made between the writing system and the transcription:

Vl unaspirated stops: π τ κ   : p t k

Vl aspirated stops: φ θ χ   : ph th kh

Vd unaspirated stops: β δ γ   : b d g

Spirants:
        Vl: σ,ʃ[1]: s

        Vd: ζ   : z(zd to mid-4th century B.C.)

Nasals and liquids: μ ν   : m   n
                              λ ρ   : l   r

Initial aspiration, which is written with ^{c} over a vowel or r, is transcribed by h before the vowel or r.

The consonantal sequences

                                 ψ   :   ps

                                 ξ   :   ks

The vowel system is transcribed as follows:

	front		central		back	
high	ι : i				υ : u	
mid-high	η : $\bar{e}$				ω : $\bar{o}$	
mid-low	ε : e				ο : o	
low			α : a			

The macron indicates vowel length. All the other vowels can also be either short or long, but they are not so indicated in the writing system.

The diphthongs are either -i or -u diphthongs, ι and
υ, respectively. The first part of the diphthongs can be
either α, ε, o, or υ for the ι-diphthongs and α, ε, o, or
η for the υ-diphthongs.[2]

A summary of these correspondances can be found in
Appendix B. Further commentary on the phonology and changes
in Modern Greek continues in Section 3.2.

"The position of the accent [pitch] has to be learned
by observation" (Smyth, 1974: 38). However, the kind of
accent is set by rules, according to the grammar books.
"The invention of the marks of accents is attributed to
Aristophanes of Byzantium, librarian at Alexandria at about
200 B.C. ... The signs for the accents (and the breathings)
were not regularly employed in Mss. till after A.D. 600"
(loc. cit.). Position and type of accent will not be
indicated in this phonemic transcription since accent does
not affect the case-marking system, for the purposes of
this dissertation.

1.2.2.2 Modern Greek

There is no change in the alphabet over the years,
from CG to MDG, although new combinations of letters that
are not found in CG are introduced for borrowings into
MDG. The transcription follows that of Mirambel (1959:23):[3]

MDG has two series of stops: voiceless and voiced (both unaspirated):

| Vl stops | π | τ | κ | : | p | t | k |
| Vd stops | μπ | ντ | γκ | : | b | d | g |

A double series of fricatives:

| Vl fricatives | φ | θ | χ | σ,ʃ[1] | : | f | θ | x | s |
| | β | δ | γ | ζ | : | v | ð | ǥ | z |

A frictionless palatal continuant:

$$\gamma \quad : \quad j$$

Note that the symbol γ represents both /ǥ/ and /j/. As part of the series of fricatives, γ represents /ǥ/ with the following phonological rule:

$$/ǥ/ \longleftarrow \begin{cases} [j]/ \_ \begin{Bmatrix} /i/ \\ /e/ \end{Bmatrix} \\ [ǥ]/ \_ \begin{Bmatrix} /o/ \\ /u/ \\ \text{all consonants} \end{Bmatrix} \end{cases}$$
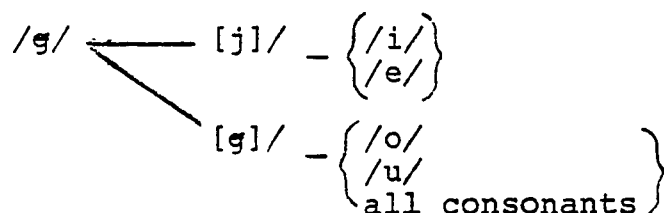
However, this rule is incomplete; the environment preceding /a/ has been omitted. Householder (1964:25) states that "here the stumbling-blocks of analysis have been the two principles 'once a phoneme, always a phoneme', and 'no overlapping allophones'." On the one hand, [j] is an allophone of /ǥ/ before front vowels, and on the other hand, /j/ is an independent phoneme. Compare the following examples: the first three γ's are allophones of /ǥ/; the last one is an independent phoneme:

γεϱos   /geros/   [jɛros]   'old man'

γovατo   /gonato/   [gonato]   'knee'

γατα   /gata/   [gata]   'cat'

για   /ja/   [ja]   'for'

The convention adopted here is to write /j/ before /a/ only.

In MDG the χ is a voiceless velar fricative represented by /x/, with the following phonetic representation according to the environment:

/x/⟨—[ç]/_ front vowels ([ç] = a palatal fricative)
    ⟨—[x]/ elsewhere

Similarly, the voiceless velar stop has two allophones, depending on the environment:

/k/⟨—[c]/_ front vowels ([c] = a palatal stop)
    ⟨—[k]/ elsewhere

Nasals and liquids are transcribed as follows:

μ   ν   :   m   n

λ   ρ   :   l   r

The phonemic status of the MDG 'double' consonants often causes problems in analysis (see Householder, 1964). In this dissertation, the following double consonants will be considered to be affricates (following Mirambel, 1959: 22f; Householder, 1964:17ff):

τσ   :   c

νζ   :   z

and the following symbols represent consonantal sequences
as in CG:

$$\psi \quad : \quad ps$$

$$\xi \quad : \quad ks$$

The vowel chart follows a symmetrical five-way
distinction:

	front	central	back
high:	i		u
mid:	e		o
low:		a	

The following symbols represent /i/, the high front
vowel:

```
η    ει
ι    οι
υ    υι
```

The mid front vowel /e/ ([ε]) is represented by:

ε and αι,

the low central vowel /a/ by α,

the high back rounded /u/ by ου,

and the mid back rounded vowel /o/ by o and ω.

The digraphs αυ, ευ, and ηυ are phonemically /af/,
/ef/, and /if/ with the following phonological rule:

/f/ ⟨—[v] / [+voice] _ [+voice]
       [f] / elsewhere

Distinctive length has been lost by Modern Greek times
(see Section 3.3.2).

The MDG vowel carries the stress, as in CG. The rules for placement of stress follow those of CG, but not always faithfully. The different accents: ´, `, and ˜ do not cary tone or pitch differences, as in CG, yet these accents continue to be used for historical reasons. Since the accents and stress are not usually distinctive, they are generally omitted from this study.

Elision takes place when identical vowels meet at word boundaries, as shown in the following illustration:

-a + a- become a

-o + o- become o

-u + u- become u

-e + e- become e

-i + i- become i

For example, ta alla becomes /talla/ 'the others'.

1.3 Survey of the literature on Greek

The two main references for Attic Greek used in this dissertation are Eduard Schwyzer's *Griechische Grammatik* (1950) and *Greek Grammar* by Herbert Weir Smyth (1974 reprint of 1918 edition). It is from these two references that most of the CG examples are taken, with the original sources also noted.

The phonological changes from Attic to Modern Greek have been documented in several places. The earliest study, and perhaps the most voluminous, appears to be Antonius Jannaris' *An Historical Greek Grammar*. Albert

Table 1.

Classical Greek and Modern Greek
Phonological Charts for Consonants

Classical Greek

		bilab	lb-dt	dent	alv	pal	vel	uvu	laryngeal
S	Vl unasp	p		t			k		
T									
O	Vl asp	ph		th			kh		
P									
S	Vd unasp	b		d			g		
F	Vl				s				h
R									
S	Vd				z				
L									
Q				l					
S				r					
N									
S		m		n					

Modern Greek

		bilab	lb-dt	dent	alv	pal	vel	uvu	laryngeal
S	Vl	p		t			k		
T									
S	Vd	b		d			g		
F	Vl		f	θ	s		x		
R									
S	Vd		v	đ	z		ǥ		
L				l					
Q									
S				r					
N									
S		m		n					
Frictionless Continuant						j			
A	Vl					c			
F									
F	Vd					ʒ			

Thumb's *A Handbook of the Modern Greek Language* (1964 translation of the 1919 second edition *Handbook der neugriechischen Volkssprache* [English 'language' for German 'vernacular']) is useful for historical notes. Edgar H. Sturtevant's *The Pronunciation of Greek and Latin* (1940, 2nd edition) and W. Sidney Allen's *Vox Graeca* (1974, 2nd edition) are indispensable resources for the phonetics and phonology of Attic Greek and make several references to Modern Greek. The 1972 edition of *Phonétique historique du mycénien et du grec ancien* by Michel Lejeune spans the period from Mycenean times to present-day Greek.

Jean Humbert's *La disparition du datif en grec*, published in 1930, is basic to the understanding of the dative case.

The best reference for Modern Greek is Thumb's *A Handbook of the Modern Greek Language*. *Reference Grammar of Literary Dimotiki* by Householder, Kazazis, and Koutsoudas is often helpful (1964), as is A. Mirambel's *La langue grecque moderne* (1959).

1.4 Case

The nouns, adjectives, and pronouns of Classical Greek and Modern Greek are classified by traditional grammarians according to the following inflectional categories: case, number, and gender.

The term 'case' is a Latin translation, *casus*, of the Greek word pt<u>ō</u>sis, 'a fall' or 'falling'. In this sense, case figuratively refers to those forms which 'fall away' from the nominative. The nominative case is the 'upright' case or the 'name' of the noun (nominative derives from Latin *nomen* 'name'). The cases which 'fall away' from the nominative case are also referred to as the oblique cases, i.e. 'slanted, sideways'. These non-nominative or oblique cases are the dative, accusative, and genitive in CG, and the accusative and genitive in MDG.

The accusative case label is a mistranslation of the Greek <u>aitiatikē</u> <u>ptōsis</u> 'case of the thing which indicates a cause (<u>aitia</u>)'. The verb which derives from this noun, <u>aitiaomai</u>, originally meant 'I attribute a cause to', later 'I attribute blame to', and still later evolved to 'I accuse'. The Latinization, *casus accusativus*, is simply 'case of the accusing', the latter extension of the meaning.

The genitive case label derives from the Latin *casus genitivus*, 'case of the source (generator)', a mistranslation of the Greek <u>genikē</u> <u>ptōsis</u>, 'case of the kind or species'.

The name for the dative case derives from the Latin *casus dativus*, 'case of the giving', a translation of the Greek <u>dotikē</u> <u>ptōsis</u>, also 'case of the giving'.

who lived at around 100 B.C. By the second century A.D.,
Apollonius Dyscolus ('the surley'), also an Alexandrian
grammarian, wrote a treatise, *Peri syntakseōs*, 'On Syntax.
In this grammar, Apollonius attributed a 'passive'or
'receptive' sense to the accusative case; 'possessive' to
the genitive; and 'from the noun' to the dative (Hjelmslev,
1972:5).

Maximus Planudes, a Byzantine scholar and theologian,
favored a local approach to the cases in his treatise, *Peri
grammatikēs dialogos, to autou peri syntakseōs*, 'Dialogue
about Grammar, the Part on Syntax' (cf. Robins, 1972).
Hjelmslev (1972:11) synopsizes Planudes's definitions of
.the cases (translation mine):

> He says...that the genitive is the case of
> removal, *'éloignement'*, and that the accusative
> is the case of approach, *'rapprochement'*. And
> this evident alignment permits him to discover
> the character of the dative...: the dative is
> the dependent case which indicates a point of
> rest between the two extreme terms as set up
> by the genitive and accusative respectively.

In the mid-1930's Jakobson and Hjelmslev independently
presented their own analyses of semantic oppositions in
case inflection systems. Hjelmslev (1972:128-134) viewed
the local aspects of prepositions from three dimensions of
oppositions:

    1) direction: approach vs. removal
    2) intimateness: coherence vs. non-coherence
    3) orientation: subjectivity vs. objectivity

Tables 2 and 3 present Hjelmslev's charts of direction and
intimateness (Table 2) and of orientation (Table 3).

Table 2.

Hjelmslev's Two-Dimensional Chart of 'Direction' vs. 'Intimateness'

	+	0	−
+	approach & coherence Lt. *in* + acc. Gm. *in* + acc.	approach Eg. *along*	approach & non-coherence Lt. *ad* Gm. *an* + acc.
(neutral 0 with regard to direction)	coherence Lt. *in* + abl. Gm. *in* + dat. Eg. *within*, inside	Lt. *inter* Gm. *zwischen* Eg. *between*	non-coherence Gm. *an* + dat.
−	removal & coherence Lt. *ex* Gm. *aus* Eg. *from within*	removal Lt. *per* Gm. *durch* Eg. *through*	removal & non-coherence Lt. *ab* Gm. *von*
		(neutral with regard to intimateness)	

In this table, the vertical dimension is that of direction. The positive term of this direction is approach '*rapprochement*', the negative term removal '*éloignement*'. The horizontal dimension is that of coherence/non-coherence. The positive term is the idea of coherence, the negative term that of non-coherence (Hjelmslev, 1972:131; translation mine).

Table 3.

Hjelmslev's Dimension 'Orientation'

One can consider arranging these ideas simply according to
the two dimensions of space that they represent or that they
seem to represent, thus:

                    au-dessus 'above'
                         |
                         |
                         |
devant 'in front of'———+———*derrière* 'behind'
                         |
                         |
                         |
                    au-dessous 'below'
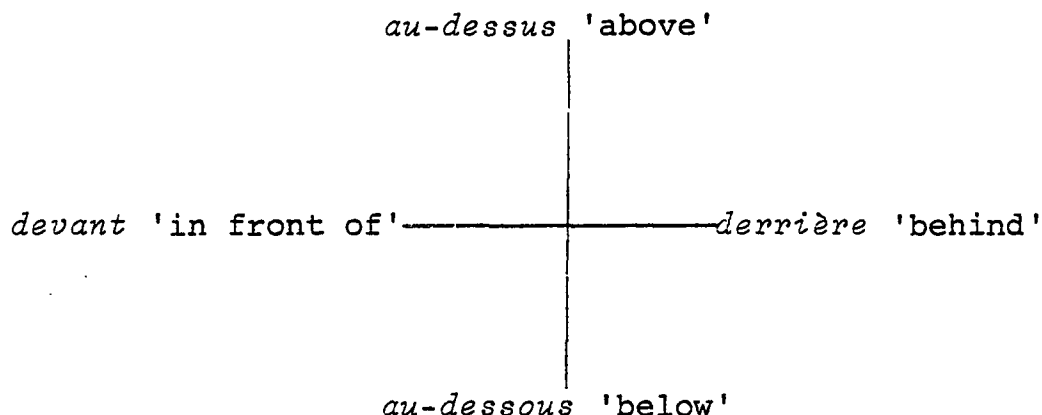
But an examination of the facts shows that this hypothesis
is not substantiated. If it were correct, the sublogic
(cf. Hjelmslev, 1972:127) system of the cases and the
prepositions would have 4 dimensions: the two dimensions
of horizontal relation and of vertical relation would be
multiplied by the two dimensions of direction and coherence.
Now the facts show that the would-be dimension of vertical
relation is never multiplied by that of coherence. In the
language, the idea of *au-dessus* permits the distinction of
coherence and non-coherence, but the idea of *au-dessous*
does not permit it...English distinguishes *on* , which
insists upon coherence, and *over* (and *above*), which
insists upon non-coherence, whereas *under* (and *below*,
beneath*) is indifferent (Hjelmslev, 1972:131f; transla-
tion mine).

Jakobson, in *'Beitrag zur allgemeinen Kasuslehre'*
(1966) 'Contribution to General Case Analysis', "reduces
the semantic differences between the grammatical morphemes
into a system of binary oppositions. In that binary
system one member of the opposition is marked by one
additional 'semantic minimum'" (Gasinski, 1966:2). These
semantic minima are: directional vs. non-directional,
quantitative vs. non-quantitative, marginal vs. non-margi-
nal, marked vs. unmarked, definite vs. indefinite, and
oblique vs. non-oblique. In 1972, R. H. Robins published
a review study of 'The Case Theory of Maximus
Planudes'.

More recently, generative grammarians have begun to
take an interest in localism. In 1968, Charles J. Fill-
more's paper 'The Case for Case' summarized some of the
earlier approaches to the study of case. In this paper,
Fillmore devoted only a portion of one paragraph to the
discussion of "the now discredited 'localistic' view of
the cases in Indo-European" (1968:9). However, in 1971,
John H. Anderson proposed localism as a viable and
interesting interpretation of case within a generative
grammar in *The Grammar of Case*, followed by his 1977
publication 'On Case Grammar: Prolegomena to a Theory of
Grammatical Relations'.

Since 1973, several Lexicase dissertations have
incorporated localistic semantic features (Li, 1973;

Kullavanijaya, 1974; and Clark, 1978 (1975 disserta-
tion)).

1.6 Lexicase

1.6.1 Theoretical background

Since 1971, the lexicase model of grammar has been
successfully applied to portions of the following languages,
many of them unrelated to each other: Rukai, Tagalog,
Kagayanen, Kusaiean, Melayu Betawi (an Indonesian Creole)
and Rennellese - all Austronesian languages; Hopi; Thai;
Vietnamese; Japanese; and Sora (an Austro-Asiatic language).
None of these languages is Indo-European, a language
family that has come to be practically synonymous with the
word 'case'. This dissertation is the first application
of lexicase to a branch of the Indo-European language
family. Both Classical Greek and Modern Greek will be
examined within a lexicase model.

The theoretical framework known as lexicase is a
non-transformational version of generative syntactic
theory that has been developed by Stanley Starosta and some
of his students at the University of Hawaii. Lexicase has
rejected the concept of underlying deep structures and
therefore, by extension, the need for transformations, and
has evolved into a formalized grammatical model incorpora-
ting surface case forms as well as case relations.

The flow chart in Figure 2 is a representation of the most recent conception of the lexicase model. There are two main parts to a lexicase grammar: the lexicon, and everything outside the lexicon but still within grammar proper.

The 'components' of the lexicon are placed in boxes and are labeled by the names of the following rules of the grammar: Redundancy Rules, Subcategorization Rules, Inflectional Redundancy Rules, and Derivational Rules. The arrows direct the flow of the grammar between components. The arrows can be thought of as being bi-directional between the lexeme and the word in order to account for the interdependence between vocabulary and rules. The arrows leading into the Derivational Rule component signify that there is a choice of either analogical rules or productive rules.

The words exit from the lexicon in a hierarchically structured string conforming to the contextual features imposed by the Redundancy Rules. The Phonological Component adds the tone, pitch, intonation, and sandhi rules of the language, resulting in the Structural Description.

The branching arrows exiting from the Structural Description of the grammar signify that the output must use information from the Semantic Interpretation Component and from the Context of Situation to assign a semantic interpretation to the structures.
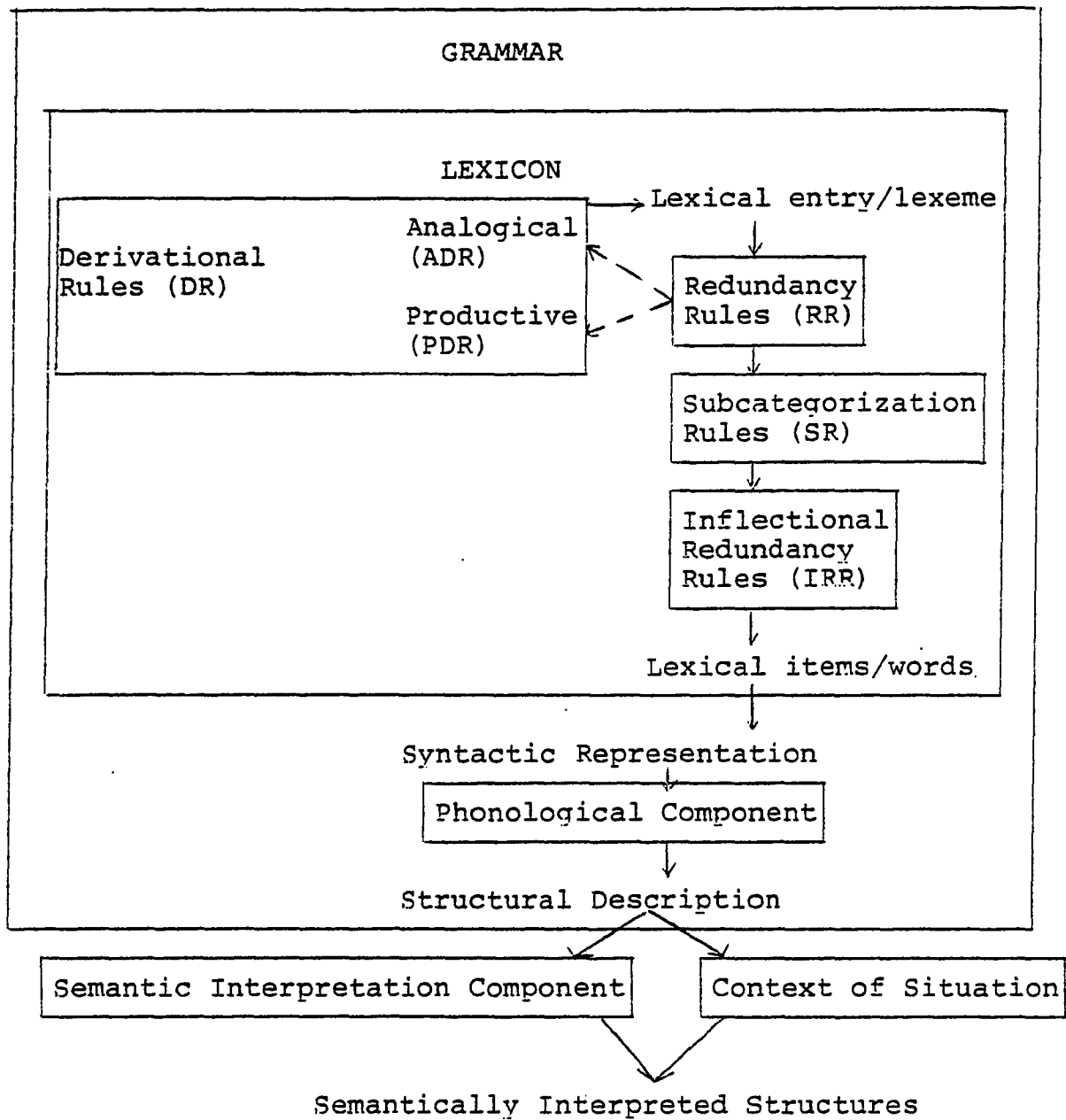
Figure 2. Lexicase flow chart

Guzman describes the lexeme of the lexicase grammar as having:

> a phonological representation and a corresponding matrix of features which are not assignable by subcategorization rules nor predictable by redundancy rules. A lexical entry represents one or more fully specified lexical items based on the applicable lexical rules (Guzman, 1978:3f).

She continues with a list of the types of significant features for the lexical items, which are summarized here:

1. lexical category features
2. case features (for case relations and case forms)
3. contextual or case frame features
4. semantic features associated with either syntactic or morphological consequences
5. morphological features
6. other idiosyncratic features, including a dictionary meaning or definition (from Guzman, 1978:4).

In Guzman's dissertation, the morphological features (Number 5, above) concern Tagalog verb phenomena associated with constraints on voice inflection. In this study of Greek, the morphological features are associated with constraints on declensions.

The three types of rules that relate lexemes to fully specified words are: Redundancy, Subcategorization, and Derivational Rules. Of these rule types, two are obligatory: Redundancy Rules (RR) and Subcategorization Rules (SR). The third category is that of the Derivational Rules (DR). The SR's set out the possible lexical categories or classes within the language. The RR's state the predictable features and the unmarked features of the lexemes. The DR's are word-formation rules, either

productive rules (PDR) which relate various word classes by
setting up productive derivations, or analogical rules
(ADR), which are the non-productive derivational rules of
the language.

There are two sub-types of Redundancy Rules and Sub-
categorization Rules: lexical and inflectional. The
lexical Subcategorization Rules (LSR or SR) are "general
statements characterizing the classes and subclasses of
lexemes in a lexicon" (Starosta, 1977:153). An initial
division into nouns and other categories is perhaps the
most fundamental within the lexicon "since N's are the only
directly referential elements in the language, and all the
other parts of speech function to assign attributes to N's
or to show their interrelationships.

    SR-1   [   ]   →   [± N]

    SR-2   [+ N]   →   [± pron]

    SR-3   [- N]   →   [± V]" (ibid:160).

The initial empty bracket is the broad class 'syntactic
categories'. The first Subcategorization Rule states that
the class of syntactic categories is divided into nominals
and non-nominals. The second SR subcategorizes all nominals
into pronouns or non-pronouns. The third SR subdivides all
non-nominals into verbs and non-verbs.

The inflectional Subcategorization Rules (SR), referred
to as ISR in former lexicase analyses, "describe the
inflectional properties of various classes of words. They

'unpack' lexemes into their various inflected forms"
(ibid:153).

> ·Formally, all subcategorization rules in a
> lexicase grammar have the same basic form: a
> class of lexical items characterized by the
> feature or features on the left side of the
> rule is composed of two...subcategories. How-
> ever, two subtypes of SR can be distinguished
> on the basis of their function: lexical sub-
> categorization rules..., which characterize
> lexical classes in terms of features perma-
> nently marked on lexical entries, and inflec-
> tional subcategorization rules, which generate
> the set of inflected forms represented by a
> given lexeme (Starosta, 1978b:3).

Generally, in a language there will be several sub-types of
ISR's. In recent lexicase analyses, the LSR's and ISR's
have been combined, since no formal reason has been found
to distinguish them.

The lexical Redundancy Rules (LRR or RR) and inflec-
tional Redundancy Rules (IRR) are the second type of rules
in a lexicase grammar. The lexical Redundancy Rules are
"general statements describing the various syntactic,
semantic, and/or phonological properties common to a cer-
tain set of lexemes. They add predictable and unmarked
features to a lexeme" (ibid:153).

The Inflectional Redundancy Rules (IRR) apply to items
which have been 'unpacked' into inflected forms. The IRR's
then add predictable and unmarked features to a lexeme. The
IRR's are also the rules that describe the predictable
inflectional morphology of a language as well as the syn-
tactic consequences of choosing a particular inflectional

category (Starosta, 1978b:19ff). The morphological rules of the nominal system will be the sole type of IRR's that will be encountered in this analysis of Greek. If this analysis were extended to include the verbal system, the inflections of the verbal system would also be included in the inflectional Redundancy Rules.

A lexicase grammar does not need an extra set of rules, the Phrase Structure Rules, to state the series of strings that occur within the language. The Redundancy Rules, which state co-occurrence requirements, are sufficient. The 'omega rule', IRR-Ω is a universal rule that states:

no lexical item can have any sisters, e.g.

$$
\text{IRR-}\Omega \quad [\quad] \rightarrow \begin{bmatrix} - \underline{\quad}[+N] \\ -[+N]\underline{\quad} \\ - \underline{\quad}[+\overline{Det}]\underline{\quad} \\ -[+Det]\underline{\quad} \\ \ldots \end{bmatrix}
$$

For a given language, particular subcategories
of lexical items will be marked as exceptions
to this general 'omega-rule', e.g.

IRR-A   [-prpr] →   [+([+Det])__]

that is, common nouns in English are allowed to
occur after determiners. (Starosta, 1978b:4f).

Any subclassification of rules in this dissertation is labeled according to the 'lower case convention', by preceding the SR, RR, or IRR with a lower case abbreviation, e.g.:

pSR   prepositional Subcategorization Rules
mIRR   inflectional morphological Redundancy Rules

No theoretical significance is claimed for the notational conventions; they are established here only for the sake of clarity and/or convenience. The notational conventions include the specific labels for the rules - the metalanguage.

The third and last type of lexical rule that plays a role in the lexicase grammar is the derivational rule (DR). Derivational rules do not apply obligatorily to all lexemes. The derivational rules state the patterns by which new syntactic classes are added to the lexicon by an analogical or productive formation. These potential lexemes can go to either of the two types of rules in the derivational rule component. These are the productive derivational rules (PDR) or the analogical derivational rules (ADR). Starosta (1977:185) states that "derivation...is the process of forming the stem of a new lexeme from the root or stem of a preexisting lexeme. The primary criteria for the identification of derived forms are syntactic and semantic rather than phonological." The productive derivational rules are rules which, as they produce words of different syntactic classes, are completely regular. The gerundive nominalization in English is an example of this, i.e. the corresponding -*ing* abstract noun exists for every non-modal finite verb in English without exception.

In a lexicase grammar there are two distinct types of trees: the syntactic tree that diagrams the string of words

and the hierarchical arrangement among the words (see below), and the feature tree that establishes the paradigmatic relationships among the items at the terminal nodes. Feature trees will be set up for each morphological class encountered in this study.

After the lexemes 'go through' the necessary rules (see Figure 2), they emerge as words or 'lexical items'. Passing from the lexicon, but still within grammar proper, the former lexemes (present words) establish themselves in their syntactic representations in accordance with their contextual features. In a lexicase grammar, it is general statements about the interrelations between contextual and non-contextual features of lexical items that take the place of PSR's. The sentences now pass outside of grammar proper into the realm of semantic interpretation and context of situation. Both of these areas play a role in the final structural description. "Semantic interpretation is derived from the interaction between the grammar input and the semantic interpretation component (including the context of situation)" (Harmon, 1977:35). The Semantic Interpretation Component uses information from the structural description and the context of situation to assign a semantic interpretation to a sentence.

The two main syntactic categories treated in this dissertation are prepositions and nouns. The following is a description of their syntactic positions:

A preposition is "the word that occurs in exocentric construction with an NP, forming a PP..." (Clark, 1978:14). Nida (1974:94) defines "exocentric constructions as those in which the unit as a whole belongs to a different external distribution class from the nuclear constituent or from both of the immediate constituents." According to this definition, the preposition joins with an NP, "an endocentric construction of which a noun is the head" (Clark, 1978:13), to form the exocentric construction PP:[4]

(1.1) <u>in the garden</u>

```
                  PP
              ____/\____
             P          NP
             |         /|
             |        / |
             |       /  N
             ·|    Det  |
             |     ·|   |
             |      |   |
            in     the garden
```
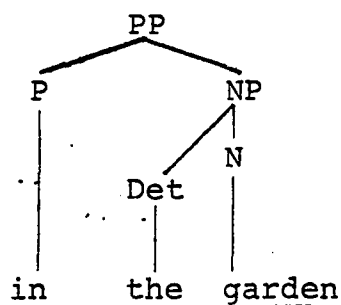
The exocentric constructions can be contrasted with endocentric constructions, which "are those in which the unit as a whole belongs to substantially the same external distribution class as the nuclear immediate constituent or both immediate constituents" (Nida, 1974:94), e.g.:

(1.2) <u>my little Mary</u>

```
                          NP
                       __/|
                    __/ / |
                 __/   /  |
                /     /   N
              Det   Adj   |
               |     |    |
              my   little Mary
```
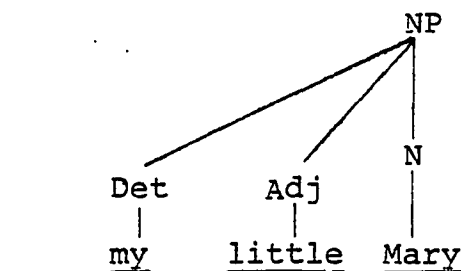
In this dissertation, the terms 'noun' and 'preposition' are defined as follows, introducing the terms 'case form' and 'case relation', concepts which are fundamental to a lexicase grammar:

N Noun: the lexical head of an NP, which is marked for a case form and case relation and has an external referent.

P Preposition: the word that occurs in exocentric construction with an NP, forming a PP, and which marks the case form of the PP (Clark, 1978:14).

The term 'case' is one of the fundamental notions in a lexicase grammar. It is considered to be an inherent feature of lexical items rather than an externally labeled relation. However, lexicase makes an important distinction between case relation (CR) and case form (CF). A case relation is the intensional syntactic-semantic relationship a nominal constituent holds with its predicate. A case form is the realization or overt manifestation of the case relation.

Guzman describes the function of the CR's and CF's:

Depending on the language, various devices are used to express case relations. It may be through affixation or suppletion of nouns or pronouns, use of particles or prepositions/ postpositions, constraints on word order, or verbal affixation (Fillmore, 1968:21,32). Thus, a case relation always has an associated case form marked by the particular mechanism the language adopts. This being the system, it is possible for a CR to be realized in more than one CF, and for a CF to represent a neutralization of more than one CR (1978:21).

In this dissertation case forms are realized by
localist features on prepositions and by the inflections on
the nouns. The extension of the localist features to pre-
positions as a realization of case forms was first proposed
by Starosta (1978a:5):

> ...prepositions are assigned semantic features
> through a kind of componential analysis that
> captures their semantic similarities as well as
> differences, and the meaning of a prepositional
> phrase is then a function of the localist fea-
> tures on the P and the case relation marked on
> the head N.

Case relations are only occasionally referred to in
this study, since we are dealing with a localist analysis
of the case-marking system, not the case relations they
realize.

1.6.2 Application of the lexicase model

In the preceding discussion of the theoretical back-
ground of lexicase, certain references were made to the
languages under consideration for the purpose of explanation
and clarification. In this section we will go into more
detail about the specific aspects of lexicase, as the
theory relates to the detailed analysis of the Classical
and Modern Greek nominal and prepositional systems.

Words such as _tamias_ 'steward' and _apo_ 'from' appear
in both CG and MDG. They are included as part of the lexi-
con in their lexemic form. These lexical entries are pre-
sented in their minimally specified phonological form,

accompanied by their non-predictable significant features.

A basic set of significant features that we will meet in this analysis of Greek include:

1. grammatical (lexical) categories, such as:

[+P]	:	preposition
[+N]	:	noun

2. case inflection labels, such as:

[+nom]	:	nominative
[+dat]	:	dative.
[+acc]	:	accusative
[+gen]	:	genitive

3. semantic features, in particular, local features, such as:

[+sorc]	:	source
[+goal]	:	goal
[+drcn]	:	direction

4. morphological features of two types: those with syntactic consequences and those without. The morphological features with no syntactic consequences are those which refer to the declensional category, such as thematic [+tm] or non-thematic [-tm] stem nominals in CG. The morphological features that have syntactic consequences are the gender distinctions, masculine [+ms], feminine [+fm], and neuter [+nt]. These features must be associated with contextual features to account for gender agreement, for example:

$$\begin{bmatrix} +N \\ +ms \end{bmatrix} \rightarrow \quad [- [-ms] \underline{\quad}]$$

A masculine noun cannot co-occur with a preceding non-mascu-
line attribute.

5. definition(s)

One category from Guzman's list has been excluded:
contextual or case frame features (her number 3; see p. 24,
this dissertation). Although this feature can also apply to
Greek, the contextual or case frame feature is not relevant
in this work since those features deal with case relations.

Tamias and apo appear with the following matrices in
CG and MDG. The matrix for tamias is identical in both CG
and MDG, but this is not always true of every word, especi-
ally in the case of the morphological features. Some of
the features for the prepositions may also coincide at both
stages.

/tamia/ (CG and MDG)	←lexeme→	/apo/ (CG	/apo/ (MDG)
'steward'	←definition→ 'from'		'from'

$$
\begin{bmatrix} +N \\ +count \\ +human \\ +ms \\ +a \end{bmatrix} \begin{matrix} \} \\ \\ \} \end{matrix}
\qquad
\begin{matrix} .\leftarrow lex.\ cat.\rightarrow \\ \leftarrow sem.\ feats.\rightarrow \\ \leftarrow morpho.\ feats. \end{matrix}
\left\{ \begin{bmatrix} +P \\ -reln \\ -surf \\ -assn \\ +sorc \end{bmatrix} \right.
\qquad
\begin{bmatrix} +P \\ -reln \\ -surf \\ -prol \\ +sorc \end{bmatrix}
$$

Definitions for these features will be discussed in
Chapters 2 and 4.

The nominal is always listed in its stem form: the
last feature in the matrix for /tamia/, [+a], indicates that
this is an a-stem. By knowing what the morphological
features are, i.e. the constraints on the nouns associated

with their declensional class, the appropriate RR's, SR's, and IRR's can then be applied.

The prepositions are always phonologically identical in their lexical entry (lexeme) form and their lexical item (word) form, since they are not inflected. The semantic features are different from CG to MDG because the prepositional lexicon is different for the two languages.

Starting with Classical Attic Greek in Chapter 3, each case-marking rule is taken through the steps of changes which affected it through the years, including the 'intermediate' rules, leading up to the rule in Modern Demotic Greek in Chapter 4.

All rules have been checked for validity using the SHOWCASE program as developed by Robert Hsu at the University of Hawaii Department of Linguistics. The SHOWCASE program applies the rules to the input lexical items and prints out the result as individual lexical matrices and as a combined tree. The program performs a valuable heuristic function in helping to find gaps and in checking the rules for accuracy, a procedure that would be very difficult 'by hand', considering the complexity of the systems involved and the number of changes that have been made in the course of the analysis. Print-outs of the trees accompany the sections on the combined case inflection and preposition system and on the combined nominal inflection

systems for both languages. The rules for each tree

print-out are reproduced in the Appendix.

1.7 Localism and lexicase

1.7.1 Relationship between localism and lexicase

John Lyons concludes his discussion of 'local'

functions, included in a section on case, with the following

statement: "No language has yet been studied in sufficient

detail from a generative point of view for it to be possi-

ble to say just how much of the coincidence between the

more clearly 'local' and the more clearly 'grammatical'

functions of cases and prepositions is synchronically

relevant in a particular language" (1968:302). This

localistic-lexicase analysis of Classical Greek and Modern

Greek is an attempt to at least partially close the gap.

This dissertation presents the first full-scale union

of the theoretical framework called lexicase and the local

semantic features of localism. The three basic local

features, location, source, and goal, are incorporated into

the analysis of prepositions and nominals in Classical Greek

and Modern Greek. The localist theory must be stated

formally and explicitly in order to meet the criteria of

the generative model of grammar and thus to meet the test

of hypothetico-deductive science, i.e., that a theory be

described in such a manner that the experiment be observa-

ble, replicable by others, and open to disproof. As

Starosta emphatically states:

> The role of formalization...is crucial. A
> grammar which does not have explicit rules and
> an associated formal calculus is not a genera-
> tive grammar - period (1975b:43).

The set of rules presented here to describe the preposi-
tional and nominal system of Classical and Modern Greek
attempt to meet these requirements.

1.7.2 Application of the localistic-lexicase hypothesis

The localistic analysis of this system is a synthesis
of Planudes's local approach to the cases of Greek; Jakobson's
binary system; Hjelmslev's oppositional features, in parti-
cular 'orientation'; Anderson's and Starosta's semantic
categories; and Starosta's lexicase features and rules.
In this dissertation, prepositional patterns and nominal
inflectional patterns make up the case-marking system in
Classical Greek and Modern Greek. The prepositions and
case-marking inflections will be viewed separately in order
to establish the distinctive local semantic features of
each system. The prepositions and inflections are then
discussed together as the case-marking system.

I will attempt to extend the three basic features of
localism within the lexicase framework to the three oblique
cases in Classical Greek. The cases and their local
semantic feature representations are as follows:

location is attributed to the dative case inflection
goal is attributed to the accusative case inflection
source is attributed to the genitive case inflection.

The nominative case of CG is not analyzable in terms
of a local semantic feature; it is for this reason that
this analysis is localistic, rather than localist (Anderson,
1971:12).

In Modern Demotic Greek, the case inflection system is
not analyzable in terms of local semantic features. It is
only the prepositions which are analyzable in terms of
local semantic components of meaning.

Based on a preliminary analysis of Russian, English,
Finnish, Korean, and Japanese (Starosta, Spring 1977:
Linguistics 640T), it appears that most of the features
used here to describe the prepositional systems of
Classical Greek and Modern Greek may be universal.

Footnotes to Chapter 1

[1] ʃ is used finally only; σ initially and medially.

[2] The digraph oʊ is generally transcribed as /ū/ (cf. Allen, 1974:71ff); however, it is transliterated as ou in this dissertation.

[3] All the symbols used correspond to IPA symbols except the following:

my transcription	IPA
ɑ	ɒ
g	ɣ

[4] The diagrams employ the lexicase 'head tree convention', where the vertical lines indicate the lexical heads of endocentric constructions (see Starosta, 1975b:65ff). Also note that the tree representations are such that the "head of a construction [is] written directly under the construction labels, and that non-heads [are] written one 'step' lower than heads. In the case of exocentric constructions, both heads are written on the same step, with the construction label centered between them on the step above" (Starosta, 1975b:66).

CHAPTER 2

The Case-Marking System of Classical Attic Greek
in a Localistic-Lexicase Framework

2.1 Introduction

Classical Attic Greek flourished during the years
c.500 to 300 B.C. This analysis is limited to the authors
of that period who wrote in Attic Greek (see Appendix C for
a list of Attic Greek authors).

This study of Classical Greek nominals and prepositions
is limited to the high frequency items in the language. The
pronominal system and low frequency items are excluded. The
phonological system and the transcription used in this
analysis were described in Section 1.2.2.1 (see Appendix B
for alphabetical listings of orthography and transcriptions).

The CG prepositions and their localist features will be
discussed and analyzed by means of trees and rules in Section
2.2. In Section 2.3 the local features will be extended to
the oblique cases. Section 2.4 combines the prepositions,
cases, and local features, with a computer print-out of the
combined tree representation. Section 2.5 describes the
declensional divisions. The nominal inflectional system is
presented in Section 2.6. The final Section, 2.7, is a
summary of the case-marking system.

All examples are followed by a reference to the imme-
diate source: either Smyth, 1974 or Schwyzer, 1950.
Abbreviations for the original sources are explained in
Appendix C.

2.2 Classical Greek prepositional system

The CG prepositional system consists of the eighteen
attested prepositions that occur in the thirty-one distinct
attested occurrences of a preposition plus a noun in one
of three possible case inflections (Schwyzer, 1950:436-553;
Smyth, 1974:371-388).

This section will be a discussion of the prepositions
alone, without the addition of the possible case inflected
nominals. Section 2.4 will discuss the co-occurrence of
prepositions and inflected nominals. Section 2.2.1 is a
discussion of the CG prepositions; 2.2.2 presents the
prepositional tree; and 2.2.3 presents and discusses the
prepositional rules.

2.2.1 Prepositions

All CG prepositions studied in this dissertation are
'simple' prepositions; ones that do not combine with other
prepositions or adverbs to form prepositional phrases
within prepositional phrases, as they do in Modern Greek
(see Section 4.2). The CG prepositions discussed here are
presented as concrete, i.e., spatial, expressions. These
prepositions are also used as expressions of time

relationships and as metaphorical extensions to express agency or manner. These uses are not within the scope of this discussion.

The following is a list of the CG prepositions and their English glosses, according to the main localist divisions of the prepositions.

The main 'directional' prepositions are:

apo 'from'
ek 'from inside'
eis 'to'
dia 'through'

The main 'locational' prepositions are:

sun 'with'
meta 'with'
epi 'on'[1]
en 'in'

The prepositions that imply 'nearness' or 'proximity' are:

pros 'by, near'
para 'by, near, beside', usually with a [+human] noun

The prepositions that suggest 'around' or 'surrounding' properties are:

amphi 'on both sides'
peri 'on all sides'

Prepositions that are defined by 'frontness' are:

pro 'in front of, before'
anti 'in front of, opposite'

Prepositions that deal with the dimension of 'verticality' are:

huper 'over'
hupo 'under'
ana 'up'
kata 'down'

Table 4 is a chart of the CG prepositions and case
inflection combinations arranged semantically according to
the three local features listed across the top: location,
goal, and source. These distinctions correspond to Lyons'
"primary 'local' distinctions [which are] 'to' : 'in/at' :
'from.'" Lyons (1968:300) claims that:

> the most general distinction to be recognized
> within the 'local' functions of the cases is
> *locative* v. *directional* ('in/at' v. 'to' or
> 'from')

and that

> the terms 'locative' and 'directional' them-
> selves are to be interpreted (like 'local') as
> neutral with respect to the distinction of space
> and time; and the distinction between 'to' and
> 'from' is a secondary distinction within
> 'directional'.

In this study the term 'location' is understood to be
synonymous with Lyons' 'locative'. 'Goal' and 'source'
are the local features attributed to the "secondary distinc-
tions within 'directional'."

The other dimensions in addition to the local features
stated at the top of Table 4 are listed along the left side
of the chart. These dimensions correspond to the divisions
of the prepositions listed on the preceding pages.

The single letter abbreviations after the preposition
indicate the case of the following noun: D = dative, A =
accusative, and G = genitive. The case labels will be dis-
cussed separately in Section 2.3 and in conjunction with the
prepositions in Section 2.4.

Table 4

Classical Greek Prepositions, Case Inflections,
and Local Features

gloss	location	goal	source/separation
direction		eis + A	apo + G ek + G
by, near	pros + D para + D epi + D	pros + A para + A	pros + G para + G
around	peri + D	amphi + A peri + A	peri + G
amid, with	sun + D meta + G	meta + A	
locus	epi + G en + D	epi + A	
through			dia + G
before	pro + G anti + G		
superior		huper + A ana + A	huper + G
inferior	hupo + D	hupo + A kata + A	hupo + G kata + G

(See Section 2.4 for a discussion of the anomalous preposi-
tions and their accompanying inflected nominal.)

The chart in Table 4 is important in its categorization of the prepositions found with nouns in two or three case inflections, such as pros and para, 'by, near'. Robins, in discussing 'The Case Theory of Maximus Planudes', assins the meaning 'side' to para and 'proximity' to pros. With these distinctions in mind, these prepositions can be used with all three case inflections, isolating a "specific prepositional component with either 'from', 'at', or 'to', according to the case...:

		genitive	dative	accusative
para	'side'	from the side of	at the side of	to the side of
pros	'vicinity'	from (the proximity of)	at(the proximity of)	towards (to the proximity of)."

(Robins, 1972:108)

These generalities and any exceptions to the pattern will be discussed in Section 2.4, Classical Greek case ·inflection and prepositional system.

2.2.2 Preposition tree

In the lexicase framework, feature trees are used to illustrate the classification of a related group of lexical items. The binary feature preposition tree in Figure 3 is based on the local semantic features of Table 4. The eighteen prepositions and the semantic distinctions of Table 4 are analyzed in terms of nine binary localist features.

In choosing the semantic units for this portion of the grammar, Clarence Sloat's two criteria for validity
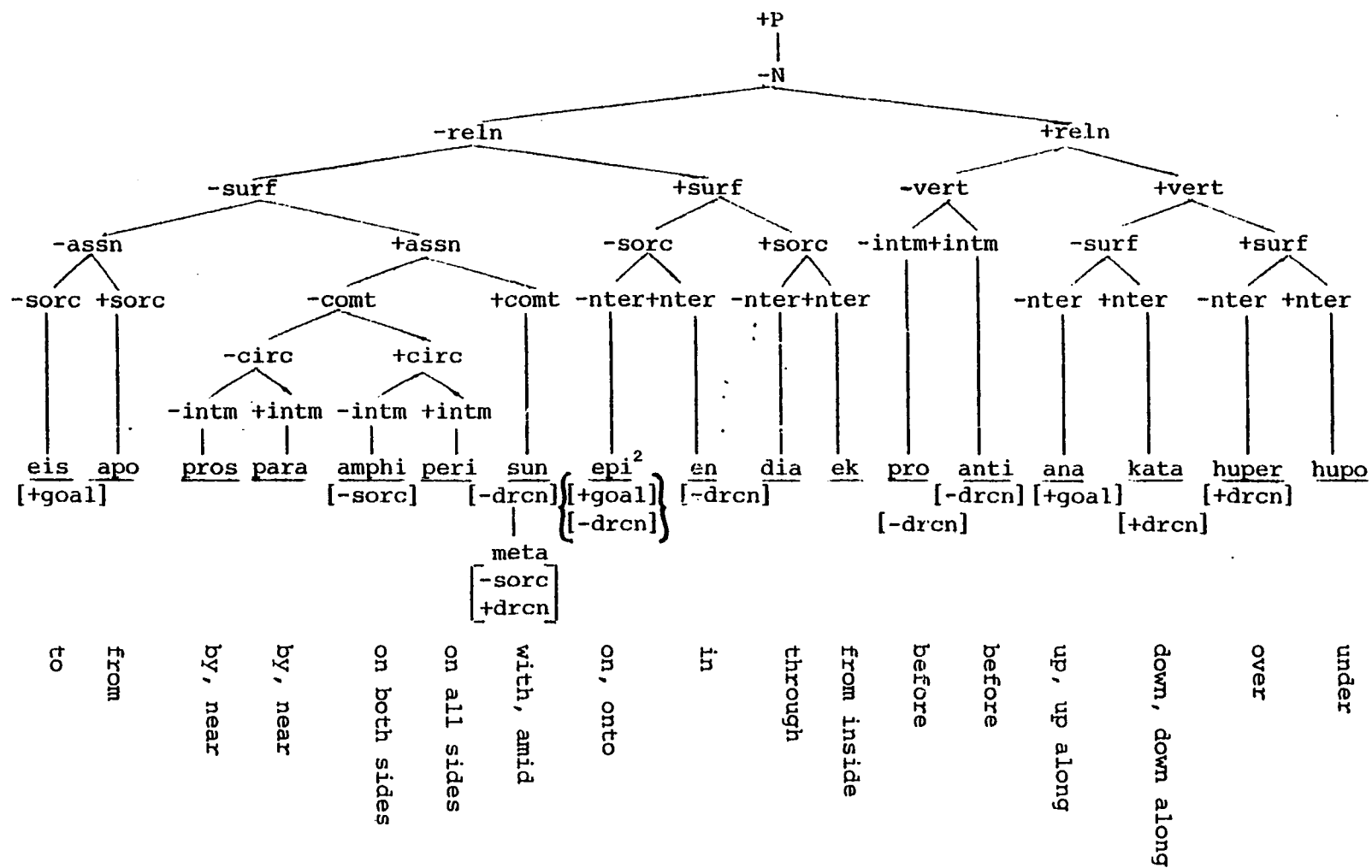
Figure 3. Classical Greek preposition tree.

have been followed   (cf.   Taylor, 1975:3 and Sloat, 1975: 393):

1. Such units must play a systematic role in the language and they must appear in derivational or inflectional systems of various languages.

2. They must demonstrate universality by appearing in totally unrelated languages. This analysis is faithful to these criteria, since:

1) these units play a systematic role in the language (and in Modern Greek as well).

2) these units appear to be universal by comparison with languages such as Russian, Finnish, Korean, and Japanese (Starosta, Spring 1977: Ling. 640T).

The features in the preposition tree of Figure 3 are distinctive features. All prepositions are unmarked for the feature of direction unless indicated within square brackets below the preposition.

The semantic features on the preposition tree are defined in terms of possessing the quality of the definition, i.e. a positive intrinsic definition. The negative counterpart of the feature is the absence of the feature.[3]

The CG preposition tree (Figure 3) begins at the uppermost node, [+P], prepositions, then [-N], non-nominals, continuing down through all the local semantic features, ending in the prepositions themselves as terminal nodes.

The necessary non-distinctive features are in square brackets under the terminal nodes.

Definitions and examples of the semantic features attributed to the prepositions will begin from the top nodes of the preposition tree, from left to right:

[+P] Prepositions: Implicit in this notation is that no other syntactic categories are included at this point. Other syntactic categories are not excluded, but simply not included in this analysis.

[±reln] Relational: The feature [+reln] distinguishes those prepositions that are used with reference to either gravity or the point of view of the speaker/perceiver from those which do not need to make such reference. This term has been appropriated from Herbert Clark's 'Space, Time, Semantics, and the Child' (1973) (see below) and is similar to Hjelmslev's *subjectivité* (1972:132f, see also Section 1.5) and to Bennett's 'deictic' (1975:36) (see below). The prepositions on the right side of the tree are those prepositions which can involve the reference point of the observer or the frame of reference established by gravity.

Bennett, in *Spatial and Temporal Uses of English Prepositions*, uses the term 'deictic' to identify the referential propositions. Bennett defines deictic as involving a reference point, "and if the listener does not know which location the speaker is taking as his reference point, he is unable to work out where the [location] is" (1975:36).

He explains apparent exceptions to the use of the term for

'front', 'back', and 'behind' by extending the definition

of deictic:

> Objects such as trees and wastepaper baskets
> have no inherent front and back. Nevertheless,
> we can still describe something as being 'behind
> the tree' or 'in front of the wastepaper basket'.
> This is because front and back may be deictically
> defined: the front of an object...is the side
> nearest to the place which the speaker treats as
> a reference point, and the back is the side
> furthest away from the reference point.

The feature [+reln] is constrasted with a [-reln]

preposition in the following examples:

(2.1) sullegesthai to strateuma ana ton...potamon

+V	+Det	+N	⌐+P ⌐	+Det	+N
will be	+NM	+NM	+reln	+acc	+acc
assembled	the	army	+vert	the	river
			-surf		
			⌊-nter⌋		
			up		

'the army will be assembled up along the river'
(Schwyzer 439;X.C. 6.2.11)

(2.2) anebainen epi ton hippon

+V	⌐ +P ⌐	+Det	+N
mounted	-reln	+acc	+acc
	+surf	the	horse
	-sorc		
	⌊ -nter⌋		
	on		

'he mounted (on) his horse'
(Smyth 379:X.C. 7.1.1)

In sentence (2.1) the [+reln] preposition ana 'up (along)'

is understood in reference to the vantage point of the

speaker/perceiver or to gravity. The [-reln] preposition

in (2.2) needs no reference to gravity nor to any speaker/

perceiver.

The remaining [+reln] prepositions (with English

examples, since this feature is applicable to the corres-

ponding prepositions in Greek and English are as follows:

in front of/before (pro and anti) 'in front of the
tree'; depends on the location of the speaker/perceiver.

over (huper) 'over the hill'; depends on the vantage
point of the speaker/perceiver.

under (hupo) 'under the table'; depends on gravity.

down (kata) 'they sailed down-stream'; depends on their
starting point from the point of view of the speaker.

Several psycholinguistic studies relevant to the estab-

lishment of the [±relational] distinction among English pre-

positions have been made. Herbert Clark in 'Space, Time,

Semantics, and the Child' discusses 'relational' prepositions,

which he defines as "specifying a direction from the point of

reference in which [sic] the object is located" (1973:42).

Clark presents evidence supporting his hypothesis that the

relational prepositions "enter the child's vocabulary after

the simpler locational prepositions 'at', 'in', and 'on'"

(ibid:56). The relational prepositions that Clark lists

are: above/below, ahead/behind, over/under, on top of/

beneath, and in front of/in back of. The CG counterparts

of these prepositions (pro, anti, huper, hupo, ana, and

kata) are the [+reln] half of the preposition tree.

In Susan Curtiss's book, *Genie: a Psycholinguistic Study
of a Modern Day 'Wild Child'*, a semantic comprehension test

was administered to support the hypothesis that Genie, who acquired language after the 'critical age' period (see Lenneberg, 1967), i.e. after puberty, is a 'right-hemisphere' language learner (Curtiss, 1977:211). (Over 90% of the population is said to be 'left-hemisphere'.) The 'general preposition test' (pages 107-110) supports Clark's hypothesis. Genie was instructed to arrange differently colored boxes and sizes in certain sequences. The instructions were to:

$$\text{Put the} \left\{ \begin{array}{l} \text{blue} \\ \text{orange} \\ \text{yellow} \\ \text{green} \\ \text{white} \end{array} \right\} \text{box} \left\{ \begin{array}{l} \text{in} \\ \text{on} \\ \text{under} \\ \text{over} \\ \text{in front of} \\ \text{in back of} \\ \text{behind} \\ \text{beside} \\ \text{next to} \end{array} \right\} \text{the} \left\{ \begin{array}{l} \text{orange} \\ \text{yellow} \\ \text{green} \\ \text{white} \\ \text{blue} \end{array} \right\} \text{box}$$

Genie scored worst on the following prepositions:

under   (59.3% of the time she put one box *over* the other)

over   (27.5% of the time she put one box *under* the other)

in front of (25.7% of the time she put one box *in back of* the other)

in back of   (26.6% of the time she put one box *in front of* the other)

behind   (32.6% of the time she put one box *in front of* the other).

For the remaining prepositions (*in*, *on*, *next to*, and *beside*) Genie scored 90 to 100%. The CG counterparts of all the prepositions for which Genie scored poorly are included on the [+reln] portion of the CG tree.

[±surf] Surface: The [+surf] prepositions refer to
multi-dimensional objects, with tops, sides, and bottoms
serving to establish a frame of reference, whereas the
[-surf] prepositions do not need to refer to multi-
dimensional objects. The meanings of the [+surf] preposi-
tions can be illustrated in the following diagram:

```
                        huper


                     epi
                        en

        <-        dia
                     <
                       ek


                       hupo
```
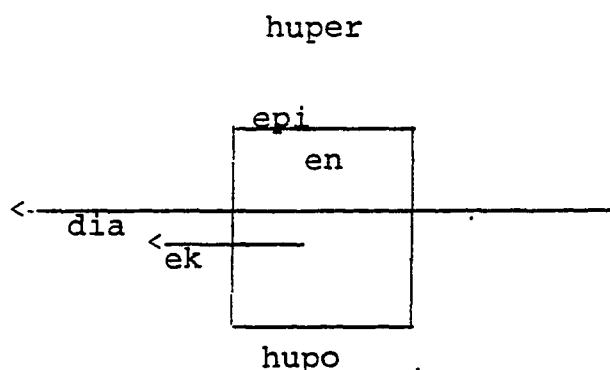
Figure 4. Classical Greek [+surface] prepositions.

The [-surf] prepositions can all be expressed with
reference to a single point:

```
                                      peri
        pros                   amphi        amphi
        para·                  peri     ·   peri
                                      peri


              sun·                    ana
              meta·        apo←·→eis   ·
                                      kata
```

Figure 5. Classical Greek [-surface] prepositions.

[±vert] Vertical: [+vert] prepositions are those prepositions which have inferior/superior counterparts (see 'superior' below). There are two sets of prepositions which fit this category: huper 'over' and ana 'up', both 'superior vertical' prepositions and hupo 'under' and kata 'down', both 'inferior vertical' prepositions. Pro and anti 'in front of' are [-vert] prepositions; they are 'horizontal' prepositions.

[±assn] Association: The feature [+assn] expresses a close relationship with reference to the noun in the prepositional phrase. The [+assn] prepositions are sun and meta 'with', pros and para 'by, near', and amphi and peri 'around'.

[±comt] Comitative: The [+comt] prepositions express companionship, as exemplified by the basic meaning of the two [+comt] prepositions, sun and meta 'with'.

[±circ] Circumambience: The two [+circ] prepositions, amphi and peri 'around' have an inherent meaning of circum-ambience, 'on both sides' and 'on all sides', respectively. The [-circ] prepositions, pros and para 'by, near' make no reference to circumambience, but refer rather to a one-dimensional bipolar relation. A [+circ] preposition in (2.3) and a [-circ] preposition in (2.4) are exemplified below:

(2.3) <u>amphi</u>   <u>Miletus</u>   (Smyth 372;X.A. 1.2.3)

$$\begin{bmatrix} +P \\ -reln \\ -surf \\ +assn \\ -comt \\ +circ \\ -intm \end{bmatrix} \quad \begin{matrix} +N \\ +acc \end{matrix}$$

'around (on both sides of) Miletus'

(2.4) <u>eke</u>   <u>par'</u>   <u>eme</u>   (Smyth 382;X.C. 4.5.25)

$$\begin{matrix} +V \\ come \\ (2\ sg) \end{matrix} \quad \begin{bmatrix} +P \\ -reln \\ -surf \\ +assn \\ -comt \\ -circ \\ +intm \end{bmatrix} \quad \begin{matrix} +N \\ +pron \\ me \end{matrix}$$

'come near me'

[±sorc] Source: The three [+sorc] prepositions are apo 'from', <u>dia</u> 'through', and <u>ek</u> 'from inside'.

[±intm] Intimate: A [+intm] preposition defines its role with its nouns as being in a closer physical relationship than a [-intm] preposition. A [+intm] preposition <u>para</u> can be compared with a [-intm] preposition <u>pros</u>, both meaning 'by, near', in sentences (2.5) and (2.6), respectively:

(2.5) <u>para</u>   <u>toi</u>   <u>didaskaloi</u>   (Smyth 382;X.C. 1.2.8)

$$\begin{bmatrix} +P \\ -reln \\ -surf \\ +assn \\ -circ \\ +intm \\ -comt \end{bmatrix} \quad \begin{matrix} +Det \\ +dat \\ the \end{matrix} \quad \begin{matrix} +N \\ +dat \\ teacher \end{matrix}$$

'beside (at the side of) the teacher'

(2.6) <u>pros</u> <u>tēi</u> <u>polei</u> <u>tēn</u> <u>makhēn</u> <u>poieisthai</u> (Smyth

$$\begin{bmatrix} +P \\ -reln \\ -surf \\ +assn \\ -circ \\ -intm \\ -comt \end{bmatrix}$$
+Det +N   +Det +N   +V   384;
+dat +dat +acc +acc to make   T.6.49)
the city the battle

'to fight near the city'

<u>Para</u> (2.5) indicates a more intimate physical relationship
with its noun than does the preposition <u>pros</u> in (2.6),
which implies 'somewhere in the vicinity'.

The other [±intm] preposition sets are:

	[-intm]	[+intm]
'around'	amphi	peri
'before'	pro	anti

[±nter] Interior: The feature [+nter] refers to the
inside of a bounded area, similar to the multi-dimensional
object described under the feature [+surf]. According to
this definition, the two [+nter] prepositions are <u>en</u> 'in'
and <u>ek</u> 'from inside'. However, the meaning of [+interior] is
extended to include the preposition sets which have a
superior/inferior dichotomy between them. These preposi-
tions are described previously under [+vert]. The 'inferior'
or [+nter] prepositions are <u>kata</u> 'down' and <u>hupo</u> 'under' vs.
the 'superior' or [-nter] prepositions <u>ana</u> 'up' and <u>huper</u>
'over'. This interpretation is supported by the Modern
Greek analysis of prepositions (see Section 4.2.2).

2.2.3 Preposition rules

Based on the semantic features established in Section 2.2.2, rules which establish the structure of the prepositional system in CG can be set up. These prepositional Subcategorization Rules (pSR) are formal notations which represent the diagrammatic tree in Figure 3.

Prepositional Subcategorization Rules

pSR-1	$\begin{bmatrix} +P \\ -N \end{bmatrix}$	→	[±reln]
pSR-2	[-reln]	→	[±surf]
pSR-3	[-surf]	→	[±assn]
pSR-4	[-assn]	→	[±sorc]
pSR-5	[+assn]	→	[±comt]
pSR-6	[-comt]	→	$\begin{bmatrix} ±circ \\ ±intm \end{bmatrix}$
pSR-7	[+surf]	→	$\begin{bmatrix} ±sorc \\ ±nter \end{bmatrix}$
pSR-8	[+reln]	→	[±vert]
pSR-9	[-vert]	→	[±intm]
pSR-10	[+vert]	→	$\begin{bmatrix} ±surf \\ ±nter \end{bmatrix}$

These rules are strictly ordered. If it eventually turns out that the rules should be unordered, the feature [-reln] would need to be added to the argument matrix (left side of pSR'-7) in order to block the application of the rule on the [+reln, +surf] branch, i.e.:

pSR'-7	$\begin{bmatrix} +surf \\ -reln \end{bmatrix}$	→	$\begin{bmatrix} ±sorc \\ ±nter \end{bmatrix}$

A brief running prose synopsis of these rules highlights the need and function of the kind of concise formalized rules that appear in a lexicase framework.

All prepositions are [-N] and are distinguished with reference to the semantic feature [±reln], i.e. all prepositions either do or do not have a possible reference to a speaker/perceiver point of view (pSR-1). The [-reln] prepositions are subcategorized with reference to a multi-dimensional object, the feature [±surf] (pSR-2). The [+reln] prepositions are subclassified according to the dichotomy of inferior and superior, the feature [±vert] (pSR-8). The [-surf] prepositions of the [-reln] branch are [±assn] prepositions (pSR-3). The [-assn] prepositions are [±sorc] prepositions (pSR-4). Along the [+assn] branch, the prepositions are subcategorized with reference to the feature [±comt] (pSR-5). The [-comt] prepositions are classified with reference both to [±circ] and to [±intm] (pSR-6). The [+surf] prepositions on the [-reln] branch are [±sorc] and [±nter] (pSR-7). On the other half of the tree, the [-vert] prepositions are [±intm] (pSR-9). The [+vert] prepositions are subclassified with reference to the features [±surf] and [±nter] (pSR-10).

All of the above rambling prose is succinctly stated in ten prepositional subcategorization rules in the localistic-lexicase framework.

2.3 Classical Greek case inflection system

The traditional labels for the five case inflections
in CG are: nominative, vocative, dative, accusative, and
genitive. The first two cases, nominative and vocative,
are non-local cases; the remaining three are local. Each
of these three oblique cases, dative, accusative, and
genitive, is identified by a specific characteristic local
feature: [+location], [+goal], and [+source], respectively.
Since two of these five cases are considered to be non-
local, this is, by definition, a localistic rather than a
localist analysis (Anderson, 1971:12).

Each local case is defined with examples of the most
frequently encountered constructions in Attic Greek; it is
on these semantic relationships that the local semantic
features are based.

Section 2.3.1 discusses the local semantic representa-
tion of the CG cases; Section 2.3.2 sets up a localistic
case tree for the nominals; and Section 2.3.3 states the
rules of the case inflection system.

2.3.1 Case inflections

NOMINATIVE: non-local, grammatical subject of the sentence
[+NM].

VOCATIVE: non-local case of address.

DATIVE: local feature: location or non-direction, [-drcn].
A noun with a dative case inflection expresses location,

encompassing three basic semantic categories: locative,
dative proper (indirect object and benefactive), and
comitative.

A local feature may add information to the relation-
ship between the case relations. The local feature, [-drcn],
may signal the presence of the case relation, Locus [+LOC],
which in turn marks the locus of the referent of the NP
in the case relation Patient [+PAT] (cf. Starosta, 1978a:
20).

a. Locative is 'used to express time and space' (Smyth,
1974:351-353), as exemplified in (2.7), without

a preposition, and (2.8), with a preposition.

(2.7). naoisi   oikeis   toiside?   (Robins, 1972:108;
       +V   +N   +Det   Euripides,Ion B 14)
       dwell (2sg)   +dat   +dat
                     -drcn   -drcn
                     +LOC   these
                     shrines

'Do you dwell in these shrines?'

(2.8) para   toi   didaskaloi   (Smyth 382; X.C. 1.2.8)
      +P   +Det   +N
      -reln   +dat   +dat
      -surf   -drcn   -drcn
      +assn   the   +LOC
      -circ   teacher
      +intm
      -comt

'by the side of the teacher'

b. Dative proper includes the indirect object, 'to whom
something is done' as in example (2.9) and dative of
interest or benefactive, 'for whom something is done',
as in example (2.10):

(2.9)

tōi	Hurkaniōi	hippon	edōrēstato	(Smyth 340;
+Det	+N	+N	+V	X.C. 8.4.24)
+dat	+dat	+acc	presented	
-drcn	-drcn	+goal	(3 sg)	
the	+LOC	+PAT		
	Hyrcanian	horse		

'He presented a horse to the Hyrcanian.'

(2.10)

soi	dōsō	andra	tēi	thugatri	(Smyth 342;
+N	+V	+N	+Det	+N	X.C. 8.4.24)
+pron	give	+acc	+dat	+dat	
+dat	(1 sg	+goal	-drcn	-drcn	
your	fut)	+PAT	the	+LOC	
		husband		daughter	

'I will give a husband to your daughter.'

c. Comitative includes instrument and accompaniment (Smyth, 1974:346-351). The case relation Instrument [+INS] "can be defined as the entity which is perceived as the immediate effective cause of the action or event referred to by the main predicator [agent,[+AGT]]" (Starosta, 1978a:13), as in example (2.11):

(2.11)

eballe	me	lithois	(Smyth 346)
+V	+N	+N	
hit	+pron	+dat	
(3 sg)	+acc	-locn	
	+goal	+INS	
	+PAT	stones	
	me		

'He hit me with stones.'

ACCUSATIVE: local feature: goal, [+goal] or [-sorc]. The accusative generally marks the grammatical direct object of a transitive verb, and functions as 'goal' or 'motion to a place', often with a preposition. Smyth (1974:354) states that the accusative is the case of the direct object, and, furthermore, that the direct object is of two kinds: the internal object (object effected) and the external object

(object affected). Semantically, both these objects are analyzed by the local feature [+goal]. Examples of these two types of 'objects' are found in sentences (2.12) and (2.13), respectively. Example (2.14) illustrates a [+goal] prepositional phrase.

object effected:

(2.12) ho   anēr   tuptēi   pollas   plēgas   (Smyth 354)
        +Det   +N   +V   +Adj   +N
        +NM   +NM   strikes   +acc   +acc
        the   man   +goal   +goal
                                  many   blows

'The man strikes many blows.'

object affected:

(2.13) ho   anēr   tuptēi   ton   paida   (Smyth 354)
                                  +Det   +N
                                  +acc   +acc
                                  +goal   +goal
                                  the   boy

'The man strikes the boy.'

prepositional phrase:

(2.14) ēke   par'   eme   (Smyth 382; X.C. 4.5.25)
        +V   ⎡+P   ⎤   +N
        come   ⎢-reln ⎥   +pron
          (2 sg) ⎢-surf ⎥   +acc
                 ⎢+assn ⎥   +goal
                 ⎢-comt ⎥   me
                 ⎢-circ ⎥
                 ⎣+intm ⎦
                  by, near

'Come with me.'

GENITIVE: local feature: source, [+sorc]. The genitive includes the genitive proper and the ablative genitive.
a. Genitive proper, which denotes 'the class to which a person or thing belongs' (Smyth, 1974:313), includes

possession, belonging, and a partitive sense. The phrase in

(2.15) is an example of a partitive genitive:

(2.15) tōn   Thrakōn   pelastai   (Smyth 315; T.7.27)
+Det   +N   +N
+gen   +gen   targeteers
+sorc +sorc
the   Thracians

'the targeteers of the Thracians'

b. Ablative genitive includes separation, cause, and

source, as in examples (2.16), with preposition, and (2.17),

without a preposition:

(Smyth 331; X.A. 1.1.1)
(2.16) Dareiou   kai   Parusatides   gignontai   paides   duo
+N   and   +N   +V   +N   +Adj
+gen   +gen   are born   +acc   two
+sorc   +sorc   +goal
Darius   Parysatis   sons

'of Darius and Parysatis are born two sons'

(2.17) para   sou   emathomen   (Smyth 382; X.C. 2.2.6)
⎡+P   ⎤   +N   +V
⎢-reln ⎥   +pron learned
⎢-surf ⎥   +gen   (1 pl)
⎢+assn ⎥   +sorc
⎢-circ ⎥   you
⎢+intm ⎥
⎣-comt ⎦

'we learned from beside you'

2.3.2 Case inflection tree

A localistic case tree can be set up, incorporating

local features as intermediate nodes with case labels as

terminal nodes. (NM and Nom, both abbreviations for

Nominative, are non-local intermediate and terminal nodes,

respectively.)
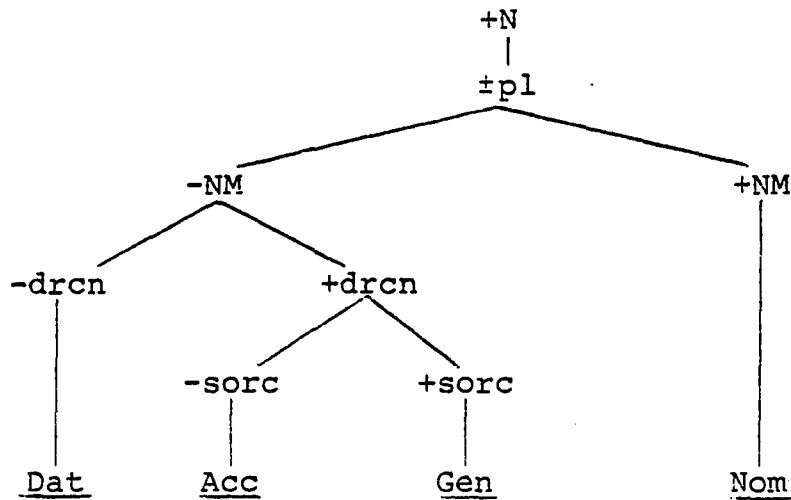
Figure 6. Basic Classical Greek case inflection tree.

The local features in this case tree are compatible
with the local features assigned to the prepositions in
Section 2.2. This consistency within the language is in
keeping with the criteria for universality among semantic
units as advocated by Sloat and Taylor (cf. Section 2.2.2).

The localistic case tree can be extended to include
inflected forms as terminal nodes. Figure 7 is a horizon-
tal paradigm of an o-stem noun (see Section 2.5), potamos
'river'.

2.3.3 Case inflection rules

The Subcategorization Rules describe the possible case
inflection categories in terms of localistic features:

cSR-1   [+N]   → $\begin{bmatrix} \pm pl \\ \pm NM \end{bmatrix}$

cSR-2   [-NM]   →   [±drcn]

cSR-3   [+drcn]   →   [±sorc]
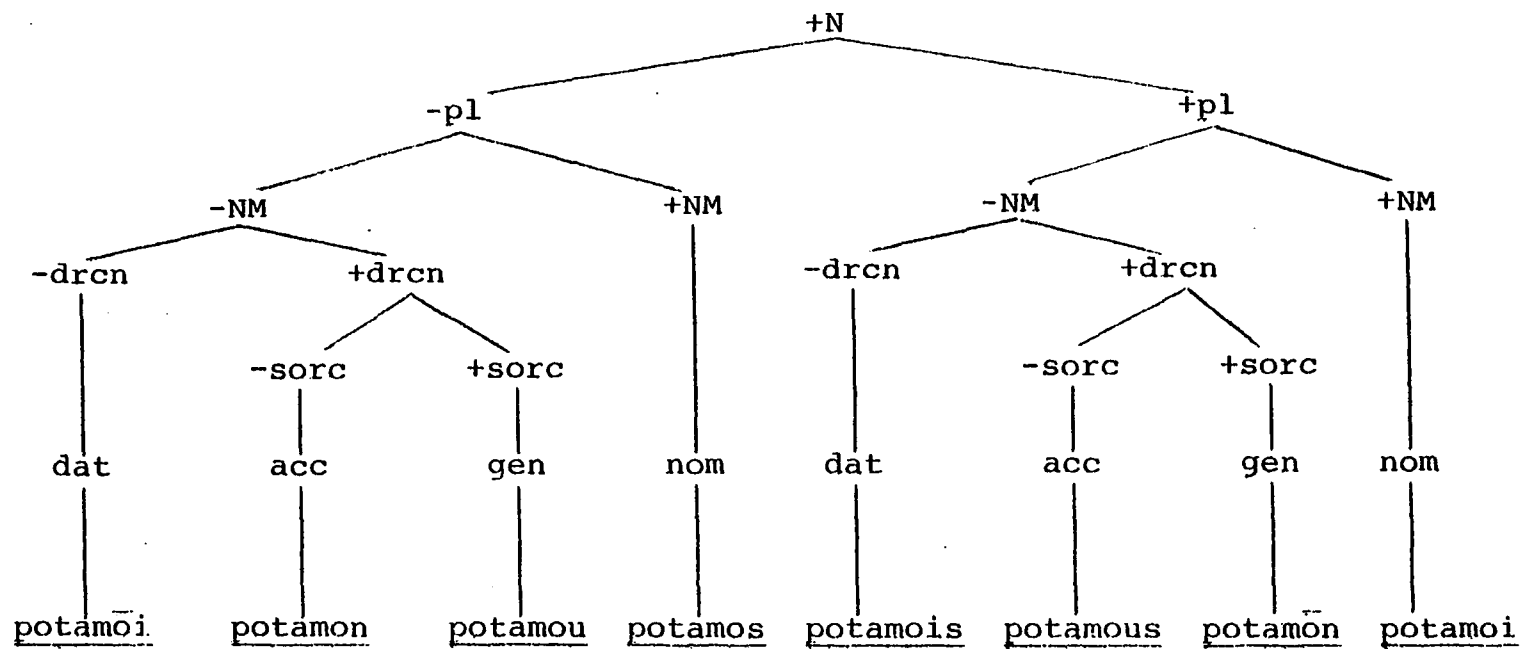
Figure 7. Classical Greek case inflection tree with noun.

To these subcategorization case rules, a set of rules
that are outside grammar proper can be added. These are
case label redundancy rules (clRR). They serve to relate
localist feature combinations to traditional designations
of the cases. The names of the cases are drawn from a
traditional set of labels; these are the terminal nodes of
the case tree:

clRR-1	[+NM]	→	[+nom]
clRR-2	[-drcn]	→	[+dat]
clRR-3	[-sorc]	→	[+acc]
clRR-4	[+sorc]	→	[+gen]

A prose analysis of these two sets of rules, the cSR's
and the clRR's, emphasizes the need for formalized rules.
The Subcategorization Rules begin by stating that all nouns
are divided into plural or non-plural and nominative or
non-nominative subcategories. The second case subcategori-
zation rule states that all non-nominatives are classified
with reference to direction. Case subcategorization rule
number three branches the directional nouns to either
source or non-source sets.

The case label rules are always redundancy rules with
the localist feature on the left implying the case label on
the right. This statement is applicable to all but the
first rule, since it does not have a local feature.
clRR-1 states that a case inflection with a nominative
case marking is labeled nominative. clRR-2 states that an

inflected noun with the feature [-drcn] will be labeled
dative. clRR-3 states that the [-sorc] feature corresponds
to the case label accusative. clRR-4 states that feature
[+sorc] corresponds to the genitive case.

2.4 Classical Greek case inflection and prepositional system

The CG prepositional phrase is composed of a preposi-
tion and an inflected nominal. In general, the preposi-
tional phrase as a whole subcategorizes the verb of the
sentence according to the combined semantic features of
the preposition feature matrix and the case feature
matrix.

In the CG prepositional phrase, the preposition
sharply circumscribes the meaning of the inflected noun.
It is often stated that a preposition governs a noun or
a particular case (cf. Paine, 1961:6; Robins, 1972:108 and
Section 1.5 of this dissertation). A description of the
role of the preposition is put forth by Smyth (1974:365):
"The prepositions define the character of the verbal
action and set forth the relations of an oblique case to
the predicate with greater precision than is possible for
the cases without a preposition." Hessinger, in 'The
Syntactic and Semantic Status of Prepositions in Greek'
describes prepositions as "occurring before and delimiting
the meaning of a noun in one of the oblique cases" (1978:
211).

Section 2.4.1 discusses the combinations of preposi-
tions and case inflected nouns as they appear in the CG
system; Section 2.4.2 includes a computer print-out of the
prepositions and the possible case inflections they can
appear with; and Section 2.4.3 states the rules of the
combinatory system of case inflections and prepositions.

2.4.1 Case inflections and prepositions

In CG the case form of a prepositional phrase as a
whole is a function of the preposition and the inflected
noun. In this section the semantic features of the
preposition are combined with the features of the inflected
noun resulting in a single 'virtual' matrix for the entire
prepositional phrase. A 'virtual' feature matrix is the
feature matrix as seen by the verb. This matrix does not
actually appear in the lexicon or in a structural descrip-
tion; the matrix in the lexicon is a 'lexical' feature
matrix. The features of the prepositional phrase's virtual
matrix subcategorize the verbs in the language. In other
words, the verbs impose their requirements on the semantic
features of the prepositional phrase, in that certain
verbs cannot co-occur with certain prepositional phrases
because of conflicting matrices.

In order to facilitate the description of the case-
marking system as an integral system, the feature matrices
of the prepositions can be combined with their admissible

case inflected noun matrices to produce the combined
virtual feature matrix for each prepositional phrase. In
the following section, the combination matrix for the
prepositional phrase is established first, then a few
sentences are presented to exemplify the idea that the
verb is subcategorized by the features of the preposi-
tional phrase as a whole.

Para 'by, near', is a preposition that can co-occur
with a noun inflected in any of three cases: dative,
accusative, and genitive. The features of para are listed
below in the lexical feature matrix:

$$\underline{para}$$

$$\begin{bmatrix} +P \\ +intm \\ -circ \\ -comt \\ +assn \\ -surf \\ -reln \end{bmatrix}$$

These features are then combined with the appropriate case
features of the co-occurring head noun, as indicated by the
case tree;

$\underline{dat}$	$\underline{acc}$	$\underline{gen}$
$[-drcn]$	$\begin{bmatrix} +drcn \\ -sorc \end{bmatrix}$	$\begin{bmatrix} +drcn \\ +sorc \end{bmatrix}$

A prepositional phrase composed of para in combination with
a NP with a head noun in the three local cases would result
in the following virtual feature matrices:

```
para + dat        para + acc        para + gen
      ⎡-drcn⎤           ⎡+drcn⎤           ⎡+drcn⎤
      │+intm│           │-sorc│           │+sorc│
      │-circ│           │+intm│           │+intm│
      │-comt│           │-circ│           │-circ│
      │+assn│           │-comt│           │-comt│
      │-surf│           │+assn│           │+assn│
      ⎣-reln⎦           │-surf│           │-surf│
                        ⎣-reln⎦           ⎣-reln⎦
```

Each preposition can similarly combine its features with
the admissible local case features of one or more case
inflections, resulting in thirty-one different combined
virtual feature matrices.

The following examples illustrate the three-way
semantic distinction in the prepositional phrase, employing
the same preposition but three different case inflections:

(2.18) dative case inflection: [-drcn] local feature

ou	para	metri	sitountai	hoi	paides	(Smyth
+pt	⎡+P ⎤	+N	+V	+Det	+N	382;
not	│+intm│	+dat	(+location)	+NM	+NM	X.C.
	│-circ│	-drcn	eat (3 pl)	the	children	1.2.8)
	│-comt│	mothers				
	│+assn│					
	│-surf│					
	⎣-reln⎦					
	by, near					

'The children do not eat by/near their mothers.'

A combined single virtual matrix of the prepositional phrase
illustrates the subcategorization of the verb by the features
of the PP, [+P,+N]:

(2.18a)   para metri sitountai   'They eat near (their)
                                                       mothers'

$$\begin{bmatrix} +P \\ +N \\ -drcn \\ +intm \\ -circ \\ -comt \\ +assn \\ -surf \\ -reln \end{bmatrix} \quad \begin{array}{l} +V \\ -drcn \end{array}$$

In the next two example sentences, para is accompanied,
respectively, by a [+goal] inflected nominal (2.19) and
by a [+sorc] inflected nominal (2.20):

(2.19)   accusative case inflection; goal, directional local
feature

heke   par'eme

$$\begin{array}{l} +V \\ +drcn \\ +goal \\ come \\ \quad (2\ sg) \end{array} \quad \begin{bmatrix} +P \\ +N \\ +goal \\ +intm \\ -circ \\ -comt \\ +assn \\ -surf \\ -reln \end{bmatrix}$$

(eme = 'me' acc. sg. case inflec-
        tion)
(Smyth 382; X.C. 4.5.25)

by/near me

'Come to my side.'

The verb in this sentence, heke (2 sg. imperative) is
marked for both direction and goal: [+drcn, +goal],
features compatible with the co-occurrence restrictions of
the feature [+goal] on the pronoun eme 'me' (acc. sg.).

(2.20) genitive case inflection; [+sorc, +drcn] local

features

automolēsantes para basilēos, (Schwyzer 497; X.A.
1.7.13)

+V		⎡+P ⎤
+sorc		+N
deserted		+sorc
(3 pl partcpl)		+intm
		-circ
		-comt
		+assn
		-surf
		⎣-reln⎦

'They deserted from the side of (near/by) the king.'

2.4.2 Case inflections and prepositional tree

From the combination of local case features and

prepositional local features, a combination prepositional

and local case tree for CG can be set up. The combination

matrices are laid out in tree-fashion in the accompanying

computer print-out (Figure 8). The rules fed into the

computer are found in Appendix F.

The uppermost nodes state the major categories:

prepositions [+P], non-nominative nouns [+N,-NM], and both

plural and singular [±plur] nouns. The next highest two

nodes, [±drcn] and [±sorc], are from the local case tree.

The lower nodes are all from the preposition tree. The

combination of local case features and prepositions can

produce a tree with fifty-one potential terminal points:

three local case features times seventeen (meta and sun

appear to be synonymous) prepositions. However, there are

a number of gaps, branches without terminal prepositions
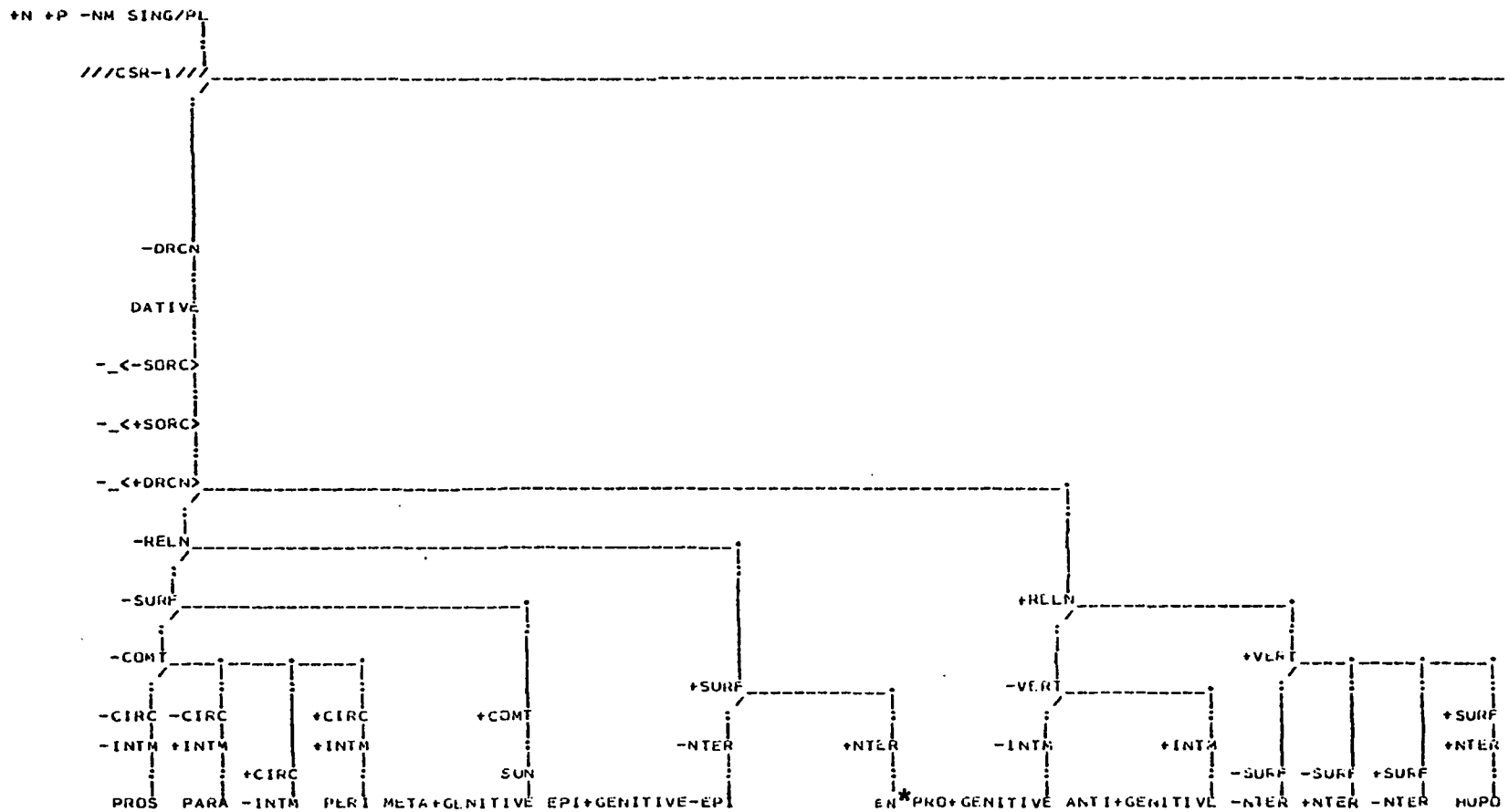
Figure 8.   Classical Greek combined case inflection and
            preposition tree.

*EN not printed out by the computer due to some unexplained error in the
program or in the rules

Figure 8. Concluded.

73
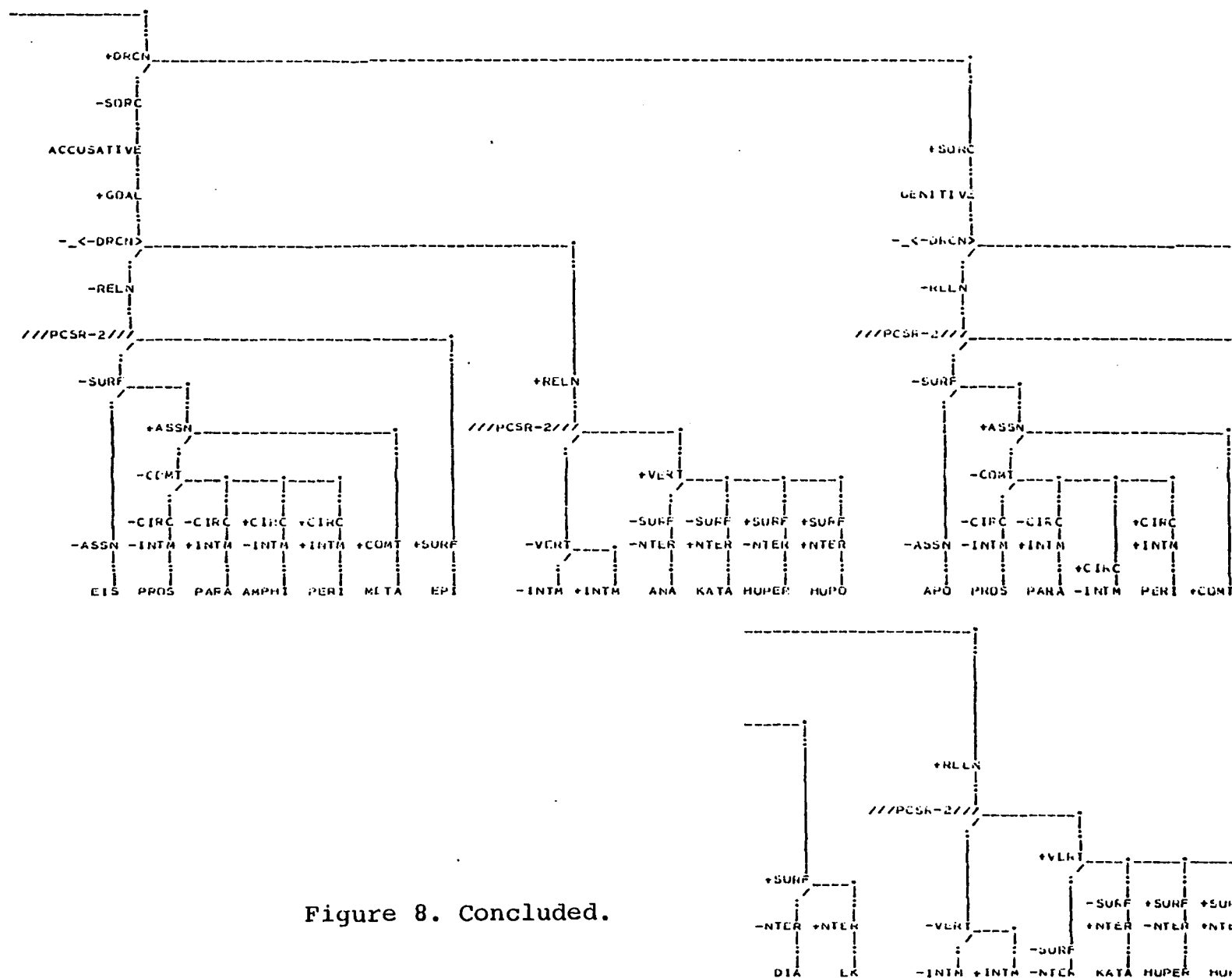
on the tree. Most of these gaps are 'logical', or expected
gaps, since the local semantic features of the prepositions
would be in direct conflict with the local semantic features
of the cases. An example of a logical gap is the unattested
combination *apo + an accusative nominal. The preposition
apo has the following feature matrix from the preposition
tree in Figure 3:

$$
\text{apo} \\
\begin{bmatrix} +sorc \\ -assn \\ -surf \\ -reln \end{bmatrix}
$$

The feature [+sorc] is compatible with the local feature
for the genitive case, [+sorc], but is in direct conflict
with the local semantic features of the other cases,
[-sorc] for accusative and [-drcn] for dative, therefore
the combinations *apo + accusative and *apo + dative are
considered to be logical gaps.

In the few places where the gap is not 'logical', a
preposition-noun inflection combination that would be used
in the expected sense must be found elsewhere. An example
of a replacement gap is the non-occurring combination of
huper 'over' + a noun inflected for location ([-drcn])
meaning 'located over'. This semantic function is signaled
instead by huper plus a noun inflected for source.

A few more prepositions need clarification in the
context of the local case features   (refer to Table 4):

1. Some prepositions must look tc the semantic features of the verb in order to fully determine the interpretation of the local feature. For example, <u>peri</u> 'around' in the following sentence, relies on the verb 'dispatched', to give the reading 'motion':

(2.21) <u>apesteilan</u>   <u>naus</u>   <u>peri</u>   <u>Peloponnēson</u>   (Smyth 383;
    +V   +N   ⌐+P ⌐ +N   T. 2.23)
    +drcn   -sorc | -reln | -sorc
    dispatched ships | -surf | Peloponnese
    (3 pl.) | +assn |
                  | -comt |
                  | +circ |
                  ⌊ +intm⌋

'They dispatched ships to all around P.'

In the following example, the prepositional phrase adds the reading of [+goal] to the verb <u>legete</u> 'speak':

(2.22) <u>pros</u>   <u>eme</u>   <u>legete</u>   (Smyth 385; X.C. 6.4.19)
    +P   +N   +V
          +pron speak
          +goal   (2 sg. imperative)
    _____ me ____/
      ⌐+P ⌐
      | +N |
      | +goal |
      | -reln |
      | -surf |
      | +assn |
      | -comt |
      | -circ |
      ⌊ -intm⌋

'Speak to me.'

2. A well known problem is the fact that <u>epi</u> 'on' with a noun inflected in the genitive case is virtually synonymous with <u>epi</u> and a dative case inflected noun. The problem is that under the localist theory, the combination <u>epi</u> + gen would result in a conflicting matrix:

$$
\begin{array}{l}
\underline{epi} + G \\
\left[\begin{array}{l}
+\text{sorc} \\
-\text{reln} \\
+\text{surf} \\
-\text{sorc} \\
-\text{nter}
\end{array}\right]
\end{array}
$$

It is quite obvious that the [-sorc] feature for _epi_ is incompatible with the feature [+sorc] for the genitive case. Despite the fact that _epi_ is found with a noun inflected in the genitive case, the semantic feature for the prepositional phrase as a whole is never [+sorc]. Smyth makes a distinction between _epi_ + dative implying proximity and _epi_ + genitive implying superposition or contact (Smyth, 1974:378f). A similar problem exists in Russian with _u_ 'by, at, near' + gen; compare the localistic feature matrices for _u_ and for the Russian genitive case (Russian has two more oblique cases than Greek: Instrumental and Locative):

$$
\begin{array}{ll}
\underline{u} & \underline{gen} \\
\left[\begin{array}{l}
+\text{P} \\
-\text{term} \\
-\text{reln} \\
-\text{drcn} \\
-\text{sorc}
\end{array}\right]
&
\left[\begin{array}{l}
+\text{N} \\
+\text{sorc}
\end{array}\right]
\end{array}
$$

Although the [-sorc] feature in the prepositional matrix is formally incompatible with the [+sorc] feature in the case matrix, the combination is perfectly acceptable.

It should be remembered at this point that the anomaly is logical, but that technically there is no formal conflict; that is, the combined virtual matrix is a description

convenience rather than an actual part of the structural
description. To make the logical anomaly a formal conflict,
rules such as the following need to be added to the grammar:

1. $\begin{bmatrix} +P \\ +sorc \end{bmatrix}$ $\rightarrow$ $[-\_[-sorc]]$

2. $\begin{bmatrix} +P \\ -sorc \end{bmatrix}$ $\rightarrow$ $[-\_[+sorc]]$

3. $\begin{bmatrix} +P \\ -drcn \end{bmatrix}$ $\rightarrow$ $[-\_[+drcn]]$

4. $\begin{bmatrix} +P \\ +drcn \end{bmatrix}$ $\rightarrow$ $[-\_[-drcn]]$

To generate logically anomalous combinations such as
Classical Greek epi + genitive and Russian u + genitive,
then, it is enough to mark epi and u as lexical exceptions
to the above Redundancy Rules, for example:

$$\begin{bmatrix} \underline{epi} \\ +P \\ +\_([+sorc]) \\ -nter \\ -sorc \\ +surf \\ -reln \end{bmatrix} \qquad \begin{bmatrix} u \\ +P \\ +\_[+sorc] \\ -sorc \\ -drcn \\ -reln \\ -term \end{bmatrix}$$

The Russian u 'by, at, near' is found only with the geni-
tive case, whereas the Greek epi 'on, onto' can appear with
any of the three oblique cases, thereby necessitating the
optional parenthesized form in CG. The function of the
positive parenthesized feature is to block otherwise
obligatory negative contextual features.

3. meta 'amid' + a noun inflected in the genitive case does
not have the expected [+sorc] semantic interpretation in
this combination, despite the [+sorc] feature marked on

the case. <u>Meta</u> + gen gives the following virtual feature

matrix:

$$
\underbrace{\text{meta} + \text{G}}
$$

$$
\begin{bmatrix}
+N \\
+P \\
+assn \\
+comt \\
-reln \\
-surf \\
-sorc \\
+drcn \\
+sorc
\end{bmatrix}
$$

} non-distinctive features added to feature tree

- from genitive case

An example of the use of <u>meta</u> and a genitive nominal is

illustrated in the following phrase:

(2.23) <u>thusai</u>   <u>met'</u>   <u>ekeinōn</u>   (Smyth 381; X.C. 3.8.1)

$$
\begin{array}{lll}
+V & \begin{bmatrix} +P \\ -reln \\ -surf \\ +assn \\ +comt \end{bmatrix} & +N \\
\text{to} & & +pron \\
\quad \text{sacrifice} & & +sorc. \\
& & \text{them}
\end{array}
$$

'to sacrifice amid (in the midst of) them'

Semantically, the prepositional phrase appears more loca-

tional than directional, and it may be that the case inflec-

tion adds a reading of separation, which would be quite

appropriate in (2.23) if the 'sacrificer' is 'among' but not

'of them'. If this were the situation, then [+_([+sorc])]

is needed to allow the genitive as [+sorc] to co-occur.

4. <u>Pro</u> and <u>anti</u> 'before', the two [+reln, -vert] prepositions

(distinguished from each other by [-intm] and [+intm],

respectively), are found with a noun inflected in the

genitive case only, and thus must be lexically marked

[+_[+sorc]]. As illustrated in the following example, the

When the preposition Subcategorization Rules are combined with the case Subcategorization Rules, they must be modified to exclude the logical gaps, such as the non-occurring apo 'from', a [+drcn, +sorc] preposition, and the dative case, a [-drcn] inflection. Redundancy Rules such as those on p. 77 must be added to block 'illegal' co-occurrences between features on the preposition matrix and contradictory features in the case inflection matrix.

The pcSR's are very similar to the pSR's of Section 2.2.3, with the addition of the cSR's and with the following modifications: pcSR-1 is similar to pSR-1 with an additional feature from cSR-2. pcSR-2 is identical to cSR-3. pcSR-3 is identical to pSR-2. pcSR-4 is similar to pSR-3 with the limitation of only applying to [+drcn] prepositions. pcSR-5 is similar to pSR-5 with an additional matrix to include those prepositions excluded from pcSR-4. pcSR-6 is identical to pSR-6. pcSR-7 is similar to pSR-7, but excludes the [-sorc] prepositions. The remaining three rules are identical in the two systems.

Case and preposition case-marking Subcategorization Rules compared with the pSR's:

pcSR-1 $\begin{bmatrix} +P \\ +N \\ -NM \end{bmatrix}$ → $\begin{bmatrix} \pm pl \\ \pm drcn \\ \pm reln \end{bmatrix}$ pSR-1 $\begin{bmatrix} -N \\ +P \end{bmatrix}$ → $[\pm reln]$.

pcSR-2 $[+drcn]$ → $[\pm sorc]$

pcSR-3 $[-reln]$ → $[\pm surf]$ pSR-2 $[-reln]$ → $[\pm surf]$

pcSR-4 $\begin{bmatrix} +drcn \\ -surf \end{bmatrix}$ → $[\pm assn]$ pSR-3 $[-surf]$ → $[\pm assn]$

pcSR-5 $\begin{Bmatrix} [+assn] \\ \begin{bmatrix} -drcn \\ -reln \\ -surf \end{bmatrix} \end{Bmatrix}$ → $[\pm comt]$ pSR-4 $[-assn]$ → $[\pm sorc]$

pSR-5 $[+assn]$ → $[\pm comt]$

pcSR-6 $[-comt]$ → $\begin{bmatrix} \pm circ \\ \pm intm \end{bmatrix}$ pSR-6 $[-comt]$ → $\begin{bmatrix} \pm circ \\ \pm intm \end{bmatrix}$

pcSR-7 $\begin{Bmatrix} \begin{bmatrix} -drcn \\ +surf \end{bmatrix} \\ \begin{bmatrix} +sorc \\ +surf \end{bmatrix} \end{Bmatrix}$ → $[\pm nter]$ pSR-7 $[+surf]$ → $\begin{bmatrix} \pm sorc \\ \pm nter \end{bmatrix}$

pcSR-8 $[+reln]$ → $[\pm vert]$ pSR-8 $[+reln]$ → $[\pm vert]$

pcSR-9 $[-vert]$ → $[\pm intm]$ pSR-9 $[-vert]$ → $[\pm intm]$

pcSR-10 $[+vert]$ → $\begin{bmatrix} \pm surf \\ \pm nter \end{bmatrix}$ pSR-10 $[+vert]$ → $\begin{bmatrix} \pm surf \\ \pm nter \end{bmatrix}$

2.5 Classical Greek declensional system

A system of three declensions obtains in CG. CG nouns
are classified according to the final segment of the stem.
The numerals (Roman for CG and Arabic for MDG are used in
this study to distinguish the systems from each other) are
used as convenient labels and are understood to be outside
the realm of grammar (analogous to the use of case labels).
The numbers correspond to the traditional 1st, 2nd, and
3rd declensions, respectively.

Section 2.5.1 discusses the declensional divisions;
Section 2.5.2 sets up a declension tree; and Section 2.5.3
presents the system of declensional rules.

2.5.1 Declensions

The declensional system has traditionally been classi-
fied according to the following system:

declensions	labels	stems (final segment)
I	a-stems(thematics)	-a
II	o-stems(thematics)	-o -s)
III	Consonant stems (non-thematics)	consonants (excluding -s or sigma stems sonorants: -i -u diphthongs

The a-stems and o-stems are thematic endings used to
form a stem to which case inflections are added. The third
declension is called non-thematic or consonant stems and
does not have a distinct thematic vowel for the entire
declension. The sonorants, one subdivision of this

declension, have a thematic vowel but it is often hidden by phonetic or analogic change, loss, or metathesis of vowels in combination with the suffixes throughout the paradigm. The consonant stems are another division of the non-thematics, as are the sigma stems. The sigma stems are set apart from other consonant stems because the -s of the stem is dropped intervocalically.

2.5.2 Declension tree

The CG declension tree first distinguishes the thematic stems from the non-thematics, then distinguishes the vowel stems from each other. The numerical labels for the declensions are in parenthetical form under the stem terminal nodes for ease of reference. As previously mentioned, these numbers are not grammatically significant.

```
                              +N
                              |
                             ±pl
              _____|_____
             |                                      |
   -thematic stems[-tm ]              +thematic stems[+tm]
             |                            _____|_____
             |                           |                        |
             |                    -a-stems[-a]           +a-stems[+a]
             |                           |                        |
   non-thematic stems           o-stems[+o]              a-stems
       (III decl)                  (II decl)             (I decl)
```
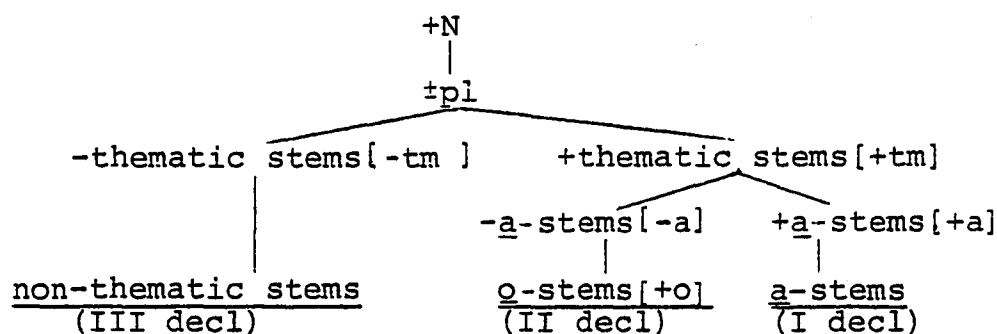
Figure 9. Basic Classical Greek declension tree

To this basic tree a few important subdivisions within each declension that are fundamental for subcategorizing the inflectional endings in Section 2.6 must be added.

Figure 10 is a complete CG declension tree, with class distinctions such as gender and type of stems (sigma, consonant, etc.):

a-stems (I declension) branch to masculine (ms) and feminine (fm) only. There are no neuter (nt) a-stems.

o-stems (II declension) are found in every gender.

Non-thematics (III declension) are either sigma (sm) stems or non-sigma stems. Among the non-sigma stems there is a division into sonorant (sn) and non-sonorant stems. Non-sonorant stems are consonant stems. Substantives of all three genders can be found in all subclasses of this declension.

2.5.3 Declension rules

There are two types of declension rules: lexical Redundancy Rules (RR's) and inflectional Subcategorization Rules (SR's). These rules correspond to the declension tree of Figure 10 in that they characterize the same classes of nouns. However, it happens that the most convenient arrangement of the tree does not, in this case, correspond with the most economical version of the rules. These rules are basic to the nominal inflection rules that will be presented in Section 2.6.

```
                                          +N
                                           |
                                          ±pl
                                    _____/ _____
                                   /                \
                     -thematic  stems              +thematic (tm) stems
                        (III decl)                    _____/  _____
                    ____/    \____                   /                \
                   /              \            -a-stems              +a - stems
               -sigma          +sigma(sm)         |                   (I decl)
               stems            stems             |               ____/    \____
            ___/   \___            |             +o          -masculine   +masculine
           /           \           |            stems            |            |
      -sonorant     +sonorant(sn)  |           (II decl)         |            |
       stems         stems         |             |               |            |
         |             |           |             |          +feminine         |
   +consonantal(cn)    |           |             |               |            |
       stems           |           |             |               |            |
         |             |           |             |               |            |
         |             |           |             |               |            |
   consonant stems  sonorant stems  sigma stems  o-stems     a-stems      a-stems
   [±neuter]        [±neuter]       [±neuter]    [±neuter]   [+feminine]  [+masculine]
```
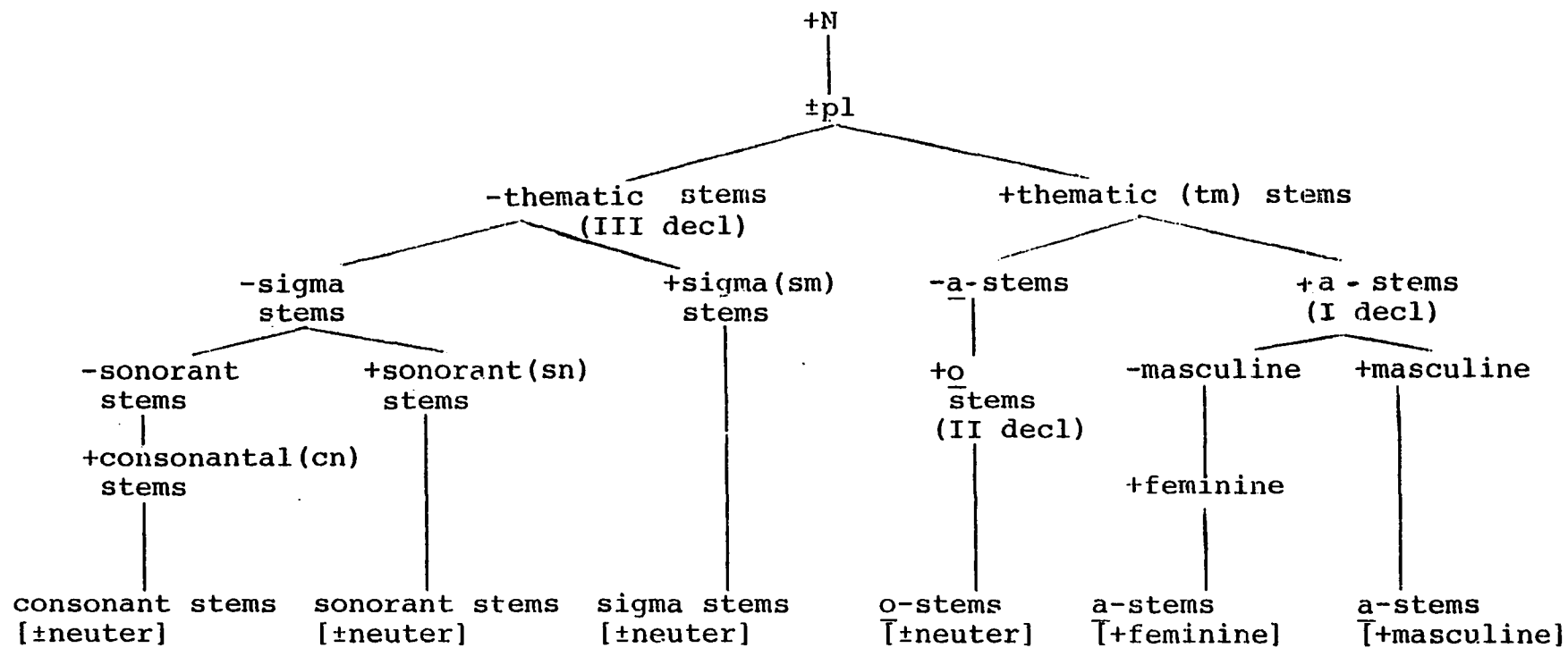
Figure 10. Classical Greek declension tree with subclasses.

dSR-1	[+N]	→	$\begin{bmatrix} \pm pl \\ \pm tm \\ \pm nt \end{bmatrix}$
dSR-2	$\begin{bmatrix} +tm \\ -nt \end{bmatrix}$	→	[±a]
dSR-3	[-tm]	→	[±sm]
dSR-4	[-sm]	→	[±sn]
dSR-5	[-nt]	→	[±ms]
RR-1	$\begin{bmatrix} +tm \\ +nt \end{bmatrix}$	→	[-a]
RR-2	[-sn]	→	[+cn]
RR-3	[-ms]	→	[+fm]
RR-4	[-a]	→	[+o]

The rules have been checked for validity with the
SHOWCASE program (see Section 1.6.2). The compilation of
these rules in conjunction with the nominal inflectional
Redundancy Rules will be set forth in Section 2.6.3, CG
inflectional rules. (See Appendix G for order and complete
set of rules inputed to the computer.)

The rules are read as follows:

All nominals in the system are plural or non-plural,
thematic or non-thematic, and neuter or non-neuter. The
thematic non-neuters are either a-stems or non-a-stems.
(RR-1 states that thematic neuters are non-a-stems; in
other words, there are no neuter a-stems.) Non-thematics
are sigma stems or non-sigma stems; non-sigma stems are
sonorant or non-sonorant stems (RR-2 states that

non-sonorant stems are consonant stems.) Non-neuter
nominals are masculine or non-masculine (RR-3 states that
non-masculines are feminine). RR-4 states that all
non-a-stems are o-stems.

2.6 Classical Greek nominal inflectional system

The suffixes of the CG nominals constitute the
inflectional system of the language for the nouns.[4] The
nominal suffixes can vary according to number, gender,
declension, and case.

Section 2.6.1 presents the inflections in chart form
followed by some examples of some of the high frequency
paradigms in CG; Section 2.6.2 sets up inflection trees
for each case, and one combined tree for all the cases;
and Section 2.6.3 presents the inflectional system in rule
format.

This analysis does not pretend to account for the
entire nominal inflection system of CG. Only the patterns
that are most frequently found in the literature are
accounted for here.

2.6.1 Nominal inflectional affixes

The two tables on the following page represent the
high-frequency inflectional affixes of the CG nominal
system. Table 5 sets forth individual declensions, stems,
and gender for the case inflections; Table 6 categorizes
the inflection system according to number for the case

Table 5.

Classical Greek Nominal Inflectional Suffixes
(individual classes)

				SINGULAR				PLURAL			
			NOM	ACC	DAT	GEN	NOM	ACC	DAT	GEN
decl	stem	gdr								
I	a									
		ms	s	n	i	ou	i	s	is	ōn
		fm	∅	n	i	s	i	s	is	on
II	o									
		ms/fm	s	n	i	ou	i	us	is	ōn
		nt	n	n	i	ou	a	a	is	on
III	cn									
		ms/fm	s	a	i	s	es	as	(a/i)si	ōn
		nt	∅	∅	i	s	a	a	asi	on
	sn									
		ms/fm	s	n	i	s	Vs	Vs	esi	ōn
		nt	∅	∅	i	s·	a	a	esi	on
	sm									
		ms/fm	∅	a	i	s	Vs	Vs	asi	ōn
		nt	∅	∅	i	s	a	a	asi	on

Table 6.

Classical Greek Nominal Inflectional Suffixes
(all classes)

CASE:	NM	DAT	ACC	GEN
LOCAL SEMANTIC FEATURE:	none	location [-drcn]	goal [-sorc]	source [+sorc]
NUMBER				
SG:	s/n/∅	i	a/n/∅	s/ou
PL:	(V)s/a/i/∅	Vsi/is	(V)s/a	ōn

inflections. This latter table summarizes the similarities in many of the declensions and cases. For example, the dative suffix -i is listed ten times in Table 5, but only once in Table 6.

These tables represent a simplified version of the nominal inflectional suffixes, in that any alteration to the stem is not apparent in the table. The morphophonemics of the nominal system adjust the stems when the inflectional suffixes are added. The morphophonemic statements follow the paradigmatic sets on the following pages with corresponding rule numbers in parentheses (e.g., mIRR'-l). The mIRR''s are the combined set of morphophonemic and suffixal rules.

I DECLENSION a-stems
              (-ā or -ē in the singular; cf. Smyth, 1974:50f)

MASCULINES

	as		ēs	
SG	'the steward'		'the judge'	
Nom	ho	tamias	ho	kritēs
Gen	tou	tamiou		kritou
Dat	tōi	tamiai		kritēi
Acc	ton	tamian		kritēn

PL				
Nom	hoi	tamiai	hoi	kritai
Gen	tōn	tamiōn		kritōn
Dat	tois	tamiais		kritais
Acc	tous	tamias		kritas
stem:		tamia-		krita-

FEMININES

	a		a		a	
SG	'the land'		'the sea'		'the victory'	
Nom	hē	khōra	hē	thalassa	hē	nikē
Gen	tēs	khōras		thalassēs		nikēs
Dat	tēi	khōrai		thalassēi		nikēi
Acc	tēn	khōran		thalassan		nikēn

PL						
Nom	hai	khōrai	hai	thalassai	hai	nikai
Gen	tōn	khōrōn		thalassōn		nikōn
Dat	tais	khōrais		thalassais		nikais
Acc	tas	khōras		thalassas		nikas
stem:		khora-		thalassa-		nika-

Morphophonemic statements for the I declension[5]

I-1. Feminines that end in a short -a̱ (such as thalassa̱)

replace the -a̱ with -e̅ in the genitive and dative singular

when the root does not end in -ṟ $\begin{bmatrix} +\text{cons} \\ +\text{son} \\ -\text{lat} \end{bmatrix}$ (cf. Smyth, 1974:

50f for details and exceptions). (mIRR'-4)

I-2. Masculines have a genitive singular in -o̱u̱ by associa-

tion with the genitive singular of the second declension;

the thematic vowel is lost when the -o̱u̱ suffix is added.

(mIRR'-13)

I-3. The thematic vowel is lost when the genitive plural

-o̅ṉ suffix is added. (mIRR'-16)

II DECLENSION o-stems

	MASCULINE	FEMININE	NEUTER
SG	'the man'	'the road'	'the gift'
Nom	ho anthrōpos	hē hodos	to[6] dōron
Gen	anthrōpou	hodou	tou dōrou
Dat	anthrōpōi	hodōi	tōi dōrōi
Acc	anthrōpon	hodon	to dōra

PL			
Nom	hoi anthrōpoi	hai hodoi	ta dōra
Gen	anthrōpōn	hodōn	tōn dōrōn
Dat	anthrōpois	hodois	tois dōrois
Acc	anthrōpous	hodous	ta dōra
stem:	anthrōpo-	hodo-	dōro-

Morphophonemic statements for the II declension:

II-1. The thematic vowel -o is lost when the genitive
singular suffix, -ou is added. (mIRR'-13)

II-2. The thematic vowel -o becomes long -ō when followed
by the -i dative singular suffix. (mIRR'-5)

II-3. As with the a-stems, the thematic vowel is lost when
the genitive plural suffix, -ōn is added. (mIRR'-16)

II-4. The thematic vowel -o becomes -a in the neuter
nominative and accusative plural. (mIRR'-7)

II-5. The thematic -o becomes -ou when the -s suffix of
the accusative plural is added. (mIRR'-13)

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III DECLENSION   non-thematic stems

	MASCULINE consonant(liquid)	FEMININE consonant(dental)	NEUTER consonant(dental)
SG	'the father'	'the hope'	'the body'
Nom	ho patēr	hē elpis	to sōma
Gen	patros	elpidos	sōmatos
Dat	patri	elpidi	sōmati
Acc	patera	elpida	sōma
PL			
Nom	hoi pateres	hai elpides	ta sōmata
Gen	paterōn	elpidōn	sōmatōn
Dat	patrasi	elpisi	sōmasi
Acc	pateras	elpidas	sōmata
stem:	pater-/patr-	elpid-	sōmat-

	NEUTER sonorant	FEMININE sonorant	NEUTER sigma
SG	'the town'	'the city'	'the prize'
Nom	to astu	he polis	to geras
Gen	asteōs	poleōs	gerōs
Dat	astei	polei	gerai
Acc	astu	polin	geras
PL			
Nom	ta astē	hai poleis	ta gera
Gen	asteōn	poleōn	gerōn
Dat	astesi	polesi	gerasi
Acc	astē	poleis	gera
stem:	astu-	poli-	geras-

Morphophonemic statements for the III declension:

III-1. The vowel of the sonorant stems becomes -e in the genitive and dative for both numbers.   (mIRR'-2)

III-2. An -o̱ is affixed to the stem when the genitive

singular -s̱ suffix is added. (mIRR'-3)

III-3. The final -s̱ of the sigma stems is lost inter-

vocalically. (mIRR'-1)

III-4. An -e̱ is affixed when the nominative plural -s̱

suffix is added to the non-neuter consonant stems.

(mIRR'-14)

III-5. An -a̱ is affixed when the accusative plural -s̱

suffix is added to the non-neuter consonant stems.

(mIRR'-8)

III-6. An -a̱ is affixed when the dative plural -s̱i̱ suffix

is added to the non-neuter consonant stems and sigma

stems. (mIRR'-8)

III-7. The final dental is lost from the stem when the

dative plural -s̱i̱ suffix is added. (mIRR'-9)

III-8. No nominative singular suffix is added to liquid or

nasal consonant stems, but the final stem vowel is

lengthened in the nominative singular. (mIRR'-18)

III-9. The stem vowel combines with the -a̱ of the nom and

acc pl, resulting in -e̅ in the neuter sonorants.

(mIRR'-19)

III-10. The stem vowel combines with the -o̱ of the masc and

fem genitive singular in the sigma stems, resulting in

-o̱u̱. (mIRR'-20)

III-11. The -o̱ of the neuter genitive singular in the sigma

stems resulting in a long -o̱̅. (mIRR'-5)

There are many more morphophonemic statements that could be made for the entire declensional system, especially for the non-thematic stems. The statements made here apply to the sample paradigms on the preceding pages and not to the entire declensional system of Classical Greek.

Morphological inflectional redundancy rules are formulated within the lexicase framework to account for the morphophonemic statements presented in this section. The basic nominal inflection tree (Figure 15) in the next section (2.6.2) is followed by a computer print-out (Figure 16) of the combined nominal inflection system (suffixes and morphophonemics) in Section 2.7.

2.6.2 Nominal inflection trees

On the following pages one inflection tree is established for each case. The terminal nodes of these inflection trees are the suffixes which are added to the stems of the nouns.

The nominative case inflection, the most complex, is examined first. The order then follows the lay-out of the master CG inflectional marking tree in Figure 15: [-drcn], dative, the most transparent and least complex of all the cases, with -i in all the suffixal forms; [-sorc], accusative; and [+sorc], genitive. The patterns encompass only the high frequency paradigms of CG.

NOMINATIVE

```
                                    +N
                                     |
                                   +NM
                    _____
                  -pl                                +pl
           _____              _____
         -tm            +tm           -nt                    +nt
      _____       _____       _____                  |
    -nt    +nt     -a     +a      -tm   +tm                   |
   _____    |    ____   ____       |     |                    |
 -sm +sm    |   -nt +nt -ms +ms    |     |                    |
  |   |     |    |   |   |   |      |     |                    |
 -s   Ø     Ø   -s  -n   Ø  -s     -s   -i                   -a
```
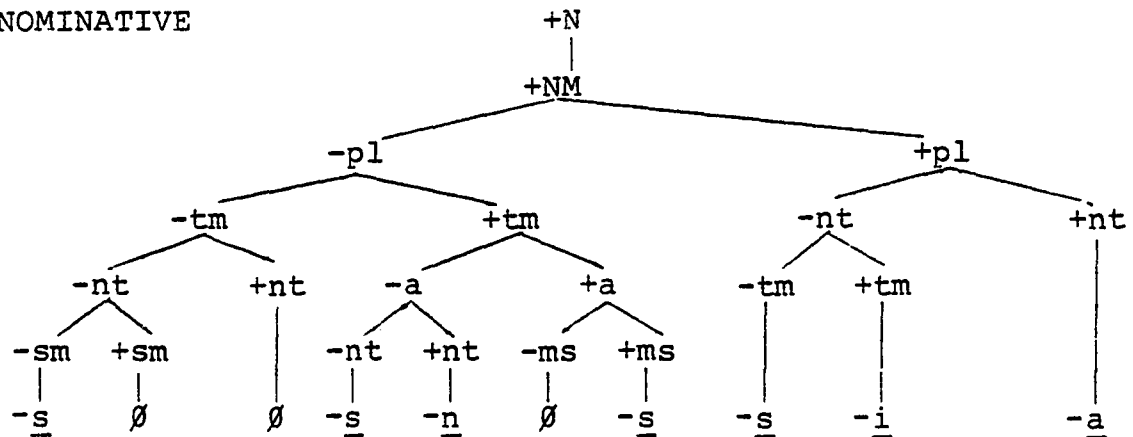
Figure 11. Classical Greek nominative inflection tree.

The nominative case is a complex system. In the nominative singular, the zero suffix and -s suffix are most frequently found. The zero suffix nominative singular form is identical to the noun stem. The thematic neuters are the exception to the -s and zero nominative singular suffix; they are found with an -n inflection.

The plural of the nominative case inflection is -a for all neuters, -i for all thematics, and -s for all non-thematics.

DATIVE
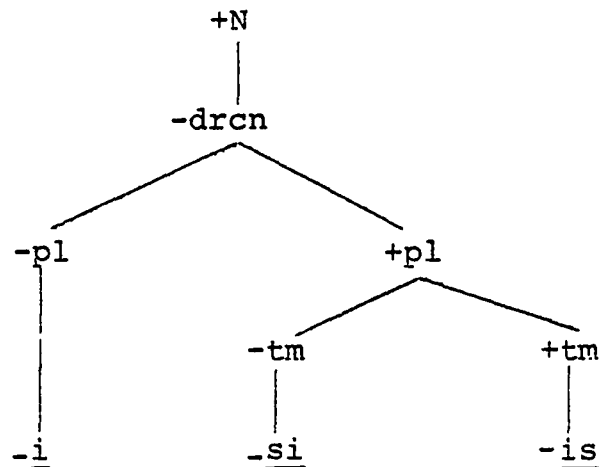
Figure 12.   Classical Greek dative inflection tree.

This tree diagrammatically states that all 'location' inflected nominals in the singular end in -i, regardless of declension or gender. The plurals, however, are distinguishable: the thematics all take -is as a plural location inflectional suffix and the non-thematics are found with -si. The vowel preceding the plural locative suffix depends on the declension: e.g. a-stems and o-stems are -ais and -ois, respectively, in the dative plural. In the third declension, the -si is added to the stem, usually with some modification to the stem.

Further support for treating the dative case as a locational, [-drcn] feature comes from the adverbs that terminate in -i, denoting place:

     -i,-thi,-si 'at,in' to denote place 'where'
     (locative)   -Smyth (1974:99).

Perhaps the -i suffix can be considered to be a locative marker in adverbs as well as dative nouns.

ACCUSATIVE

```
                                +N
                                 |
                               -sorc
                    _____/    _____
                  -pl                            +pl
             ____/  \____                      _/  \_
           -tm          +tm                  -nt      +nt
        __/  \__          |                   |        |
      -nt      +nt        |                   |        |
       |        |         |                   |        |
      -a        ∅        -n                  -s       -a
```
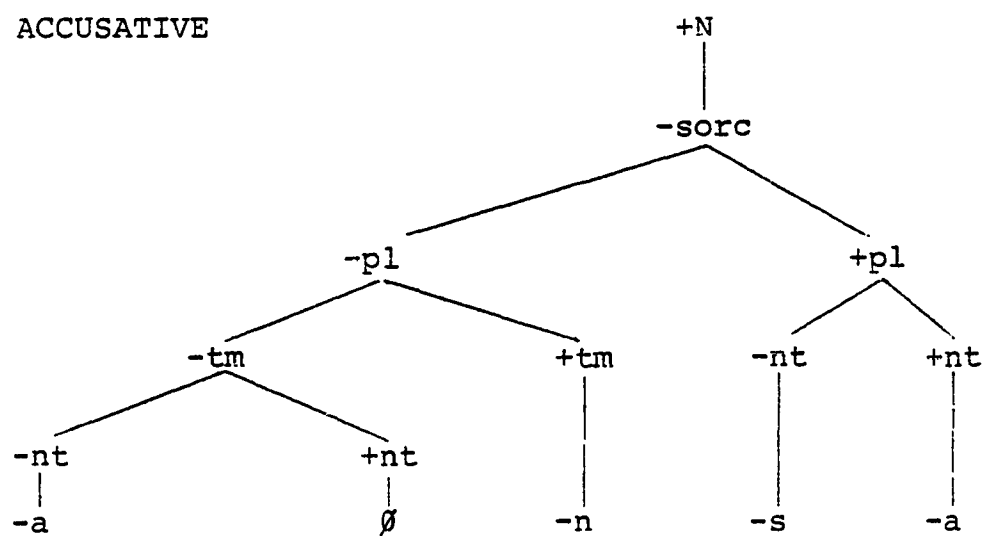
Figure 13. Classical Greek accusative inflection tree.

The divisions in the [-sorc] inflection tree are along the neuter/non-neuter distinctions. The singular thematic stems always end in -n, preceded by the vowel of the stem class. The neuter non-thematic stems have no suffix added, and are therefore identical to the stem form. The masculine and feminine non-thematic stems usually end in -a. In the plural, all non-neuters have an -s suffix and all neuters an -a.

GENITIVE

```
                                    +N
                                    |
                                  +sorc
                        _____/_____
                      -pl                          +pl
                 _____/_____                     |
               -tm            +tm                   |
                |         _____/\_____              |
                |       -a          +a              |
                |        |      _____/\_____         |
                |        |    -ms         +ms        |
                |        |     |           |         |
               -s      -ou    -s         -ou       -on
```
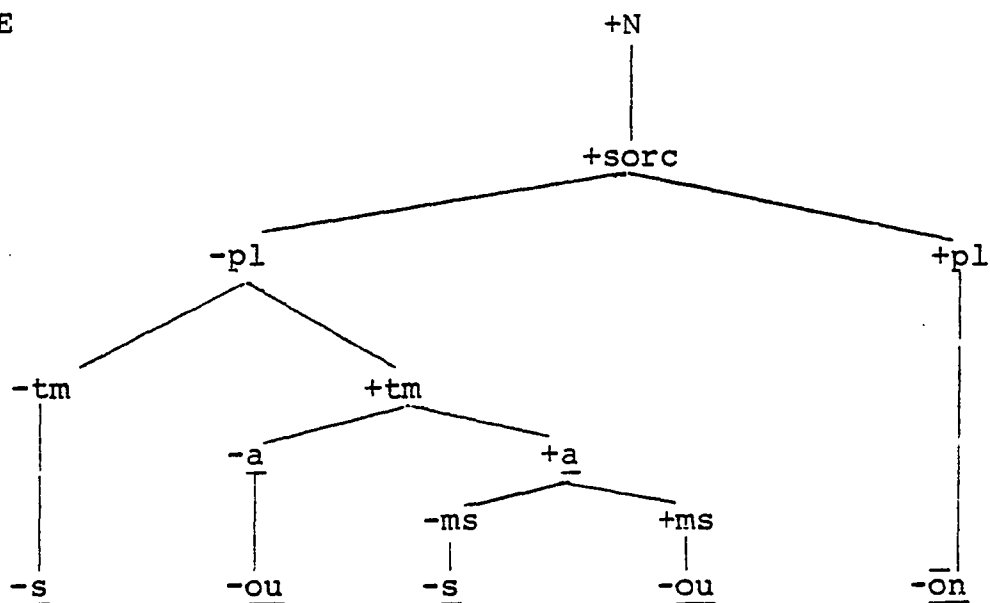
Figure 14.   Classical Greek genitive inflection tree.

The major inflectional distinctions among the [+sorc] nominals are within the singular. All the non-a-stems (i.e. o-stems) and the masculine a-stems are marked with an -ou suffix. All the non-thematics and the feminine a-stem nominals are marked with an -s suffix in the singular. The -s of the non-thematics is usually preceded by an -o; that of the thematics by the vowel of the stem.

All [+sorc] nominals have -on as a plural suffix.
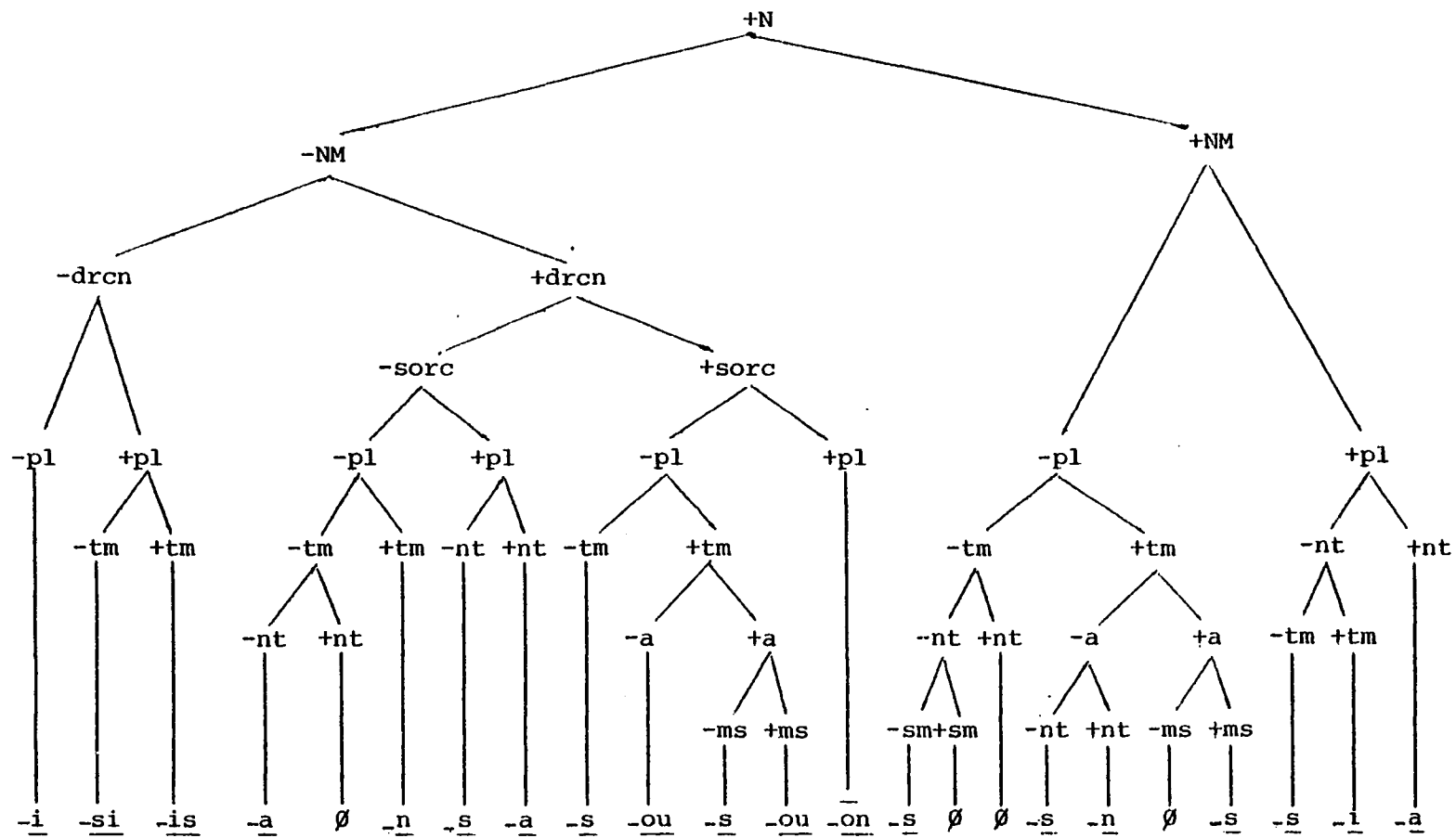
Figure 15. Classical Greek nominal inflection tree.

2.6.3 Nominal inflection rules

The inflectional marking rules presented here are the morphological rules of the language. Since this is an analysis of the nominal system, these are nominal inflection rules. These rules state the inflections of the nouns according to case, declension, gender, and number.

The eight mIRR's on the following page account for the high frequency inflectional patterns that have been laid out in Tables 5 and 6 and in tree form in Figure 15. Most rules have more than one argument matrix, the matrix which states the environment for the application of the inflectional suffix.

The symbol] signifies the end of the stem of the noun. The empty] is read as 'at the end of the stem of the noun'; the same symbol on the right side of the arrow with a segment in front of it signifies the suffix to be added.

The morphophonemic statements of the preceding section are formulated into rules which are incorporated into the entire system of nominal inflections. The entire set of morphological inflectional rules is a combination of the nominal inflectional suffixes and the morphophonemic adjustments. The rules that state nominal inflectional suffixes alone are the mIRR's; the combined rules are the mIRR''s (mIRR primes).

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CG INFLECTIONAL MARKING REDUNDANCY RULES

mIRR-1

$$] \rightarrow \text{i]} / \left\{ \begin{bmatrix} +NM \\ +pl \\ +tm \\ -nt \end{bmatrix} \begin{bmatrix} -drcn \\ -pl \end{bmatrix} \right\}$$

mIRR-2

$$] \rightarrow \text{si]} / \begin{bmatrix} -drcn \\ +pl \\ -tm \end{bmatrix}$$

mIRR-3

$$] \rightarrow \text{is]} / \begin{bmatrix} -drcn \\ +pl \\ +tm \end{bmatrix}$$

mIRR-4

$$] \rightarrow \text{a]} / \left\{ \begin{bmatrix} +NM \\ +pl \\ +nt \end{bmatrix} \begin{bmatrix} -sorc \\ -pl \\ -tm \\ -nt \end{bmatrix} \begin{bmatrix} -sorc \\ +pl \\ +nt \end{bmatrix} \right\}$$

mIRR-5

$$] \rightarrow \text{n]} / \left\{ \begin{bmatrix} +NM \\ -pl \\ +nt \\ -a \end{bmatrix} \begin{bmatrix} -sorc \\ -pl \\ +tm \end{bmatrix} \right\}$$

mIRR-6

$$] \rightarrow \text{s]} / \left\{ \begin{bmatrix} +NM \\ -pl \\ -sm \\ -nt \end{bmatrix} \begin{bmatrix} +NM \\ -pl \\ -nt \\ -a \end{bmatrix} \begin{bmatrix} +NM \\ -pl \\ +ms \\ +a \end{bmatrix} \begin{bmatrix} +NM \\ +pl \\ -tm \\ -nt \end{bmatrix} \begin{bmatrix} -sorc \\ +pl \\ -nt \end{bmatrix} \begin{bmatrix} +sorc \\ -pl \\ -tm \end{bmatrix} \begin{bmatrix} +sorc \\ -pl \\ -ms \\ +a \end{bmatrix} \right\}$$

mIRR-7

$$] \rightarrow \text{ou]} / \left\{ \begin{bmatrix} +sorc \\ -pl \\ +o \end{bmatrix} \begin{bmatrix} +sorc \\ -pl \\ +ms \\ +a \end{bmatrix} \right\}$$

mIRR-8

$$] \rightarrow \overline{\text{on]}} / \begin{bmatrix} +sorc \\ +pl \end{bmatrix}$$

COMBINED CG INFLECTIONAL MARKING REDUNDANCY RULES

corresponding to:

<u>morphophonemic statement:</u>

mIRR'-1

$$s] \rightarrow]/ \left\{ \begin{matrix} \begin{bmatrix} +NM \\ +pl \\ +sm \\ +nt \end{bmatrix} & III\text{-}3 \\ \begin{bmatrix} -drcn \\ +sm \end{bmatrix} & III\text{-}3 \\ \begin{bmatrix} +sorc \\ +sm \end{bmatrix} & III\text{-}3 \\ \begin{bmatrix} -sorc \\ -pl \\ +sm \\ -nt \end{bmatrix} & III\text{-}3 \\ \begin{bmatrix} -sorc \\ +pl \\ +sm \\ +nt \end{bmatrix} & III\text{-}3 \end{matrix} \right.$$

mIRR'-2

$$V] \rightarrow e]/ \left\{ \begin{matrix} \begin{bmatrix} -drcn \\ +sn \end{bmatrix} & III\text{-}1 \\ \begin{bmatrix} +sorc \\ +sn \end{bmatrix} & III\text{-}1 \end{matrix} \right\}$$

mIRR'-3

$$] \rightarrow o]/ \begin{bmatrix} +sorc \\ -pl \\ -tm \end{bmatrix} \qquad III\text{-}2$$

mIRR'-4

$$\begin{bmatrix} +cons \\ +son \\ -lat \end{bmatrix} a] \rightarrow \begin{bmatrix} +cons \\ +son \\ -lat \end{bmatrix} \bar{e}]/ \left\{ \begin{matrix} \begin{bmatrix} -drcn \\ -pl \\ +fm \\ +a \end{bmatrix} & I\text{-}1 \\ \begin{bmatrix} +sorc \\ -pl \\ +fm \\ +a \end{bmatrix} & I\text{-}1 \end{matrix} \right.$$

	corresponding to:
	morphophonemic
mIRR	statement:

mIRR'-5

$$o] \rightarrow \bar{o}] / \begin{Bmatrix} \begin{bmatrix} -drcn \\ -pl \\ +o \end{bmatrix} \\ \begin{bmatrix} +sorc \\ -pl \\ +sm \\ +nt \end{bmatrix} \end{Bmatrix}$$

II-2

III-11

mIRR'-6

$$] \rightarrow i] / \begin{Bmatrix} \begin{bmatrix} +NM \\ +pl \\ +tm \\ -nt \end{bmatrix} \\ \begin{bmatrix} -drcn \\ -pl \end{bmatrix} \end{Bmatrix}$$

mIRR-1

mIRR-1

mIRR'-7 .

$$o] \rightarrow] / \begin{Bmatrix} \begin{bmatrix} +NM \\ +pl \\ +nt \\ +o \end{bmatrix} \\ \begin{bmatrix} -sorc \\ +pl \\ +nt \\ +o \end{bmatrix} \end{Bmatrix}$$

II-4

II-4

corresponding to:

	mIRR	morphophonemic statement:

mIRR'-8

$$\begin{bmatrix} +NM \\ +pl \\ +nt \end{bmatrix}\quad \text{mIRR-4}$$

$$\begin{bmatrix} -sorc \\ -pl \\ -tm \\ -nt \end{bmatrix}\quad \text{mIRR-4}$$

$$\begin{bmatrix} -sorc \\ +pl \\ +nt \end{bmatrix}\quad \text{mIRR-4}$$

$] \quad \rightarrow \quad a]/$

$$\begin{bmatrix} -sorc \\ +pl \\ +cn \\ -nt \end{bmatrix}\quad \text{III-5}$$

$$\begin{bmatrix} -drcn \\ +pl \\ +sm \end{bmatrix}\quad \text{III-6}$$

$$\begin{bmatrix} -drcn \\ +pl \\ +cn \end{bmatrix}\quad \text{III-6}$$

mIRR'-9 III-7

$[+dent]] \quad \rightarrow \quad]/ \begin{bmatrix} -drcn \\ +pl \\ +cn \\ +nt \end{bmatrix}$

mIRR'-10

$] \quad \rightarrow \quad si]/ \begin{bmatrix} -drcn \\ +pl \\ -tm \end{bmatrix}\quad \text{mIRR-2}$

mIRR'-11

$] \quad \rightarrow \quad is]/ \begin{bmatrix} -drcn \\ +pl \\ +tm \end{bmatrix}\quad \text{mIRR-3}$

	mIRR	morphophonemic statement:

mIRR'-12

$$] \rightarrow n]/ \begin{Bmatrix} \begin{bmatrix} +NM \\ -pl \\ +nt \\ -a \end{bmatrix} \\ \begin{bmatrix} -sorc \\ -pl \\ +tm \end{bmatrix} \end{Bmatrix}$$

mIRR-5

mIRR-5

mIRR'-13

$$\begin{Bmatrix} a \\ o \end{Bmatrix}] \rightarrow ou]/ \begin{Bmatrix} \begin{bmatrix} +sorc \\ -pl \\ +o \end{bmatrix} \\ \begin{bmatrix} +sorc \\ -pl \\ +ms \\ +a \end{bmatrix} \\ \begin{bmatrix} -sorc \\ +pl \\ +o \end{bmatrix} \end{Bmatrix}$$

II-5

mIRR-7   I-2

mIRR-7   II-1

mIRR'-14

$$] \rightarrow e]/ \begin{bmatrix} +NM \\ +pl \\ +cn \\ -nt \end{bmatrix}$$

III-4

corresponding to:

	mIRR	morphophonemic statement:

mIRR'-15

$$\begin{bmatrix} +\text{NM} \\ -\text{pl} \\ -\text{sm} \\ -\text{nt} \end{bmatrix}$$ mIRR-6

$$\begin{bmatrix} +\text{NM} \\ -\text{pl} \\ -\text{nt} \\ -\text{a} \end{bmatrix}$$ "

$$\begin{bmatrix} +\text{NM} \\ -\text{pl} \\ +\text{ms} \\ +\text{a} \end{bmatrix}$$ "

$$\begin{bmatrix} +\text{NM} \\ +\text{pl} \\ -\text{tm} \\ -\text{nt} \end{bmatrix}$$ "

$$] \quad \rightarrow \quad \text{s}]\Big/ \begin{Bmatrix} \end{Bmatrix}$$

$$\begin{bmatrix} -\text{sorc} \\ +\text{pl} \\ -\text{nt} \end{bmatrix}$$ "

$$\begin{bmatrix} +\text{sorc} \\ -\text{pl} \\ -\text{tm} \end{bmatrix}$$ "

$$\begin{bmatrix} +\text{sorc} \\ -\text{pl} \\ -\text{ms} \\ +\text{a} \end{bmatrix}$$ "

mIRR'-16

$$\begin{bmatrix} +\text{sorc} \\ +\text{pl} \\ +\text{tm} \\ +\text{o} \end{bmatrix}$$ mIRR-8   II-3

$$\begin{Bmatrix} \text{o} \\ \text{a} \end{Bmatrix}] \quad \rightarrow \quad \overline{\text{o}}\text{n}]\Big/ \begin{bmatrix} +\text{sorc} \\ +\text{pl} \\ +\text{tm} \\ +\text{a} \end{bmatrix}$$ mIRR-8   I-3

corresponding to:

	mIRR	morphophonemic statement:

mIRR'-17
$$] \quad \rightarrow \quad \overline{o}n]/ \begin{bmatrix} +sorc \\ +pl \\ -tm \end{bmatrix} \quad \text{mIRR-8}$$

mIRR'-18
$$\begin{Bmatrix} [+lqd] \\ [+nas] \end{Bmatrix} Vs] \rightarrow \begin{Bmatrix} [+lqd] \\ [+nas] \end{Bmatrix} \overline{V}]/ \begin{bmatrix} +NM \\ -pl \\ +cn \\ -nt \end{bmatrix} \qquad III-8$$

mIRR'-19
$$Va] \qquad \overline{e}]/ \begin{Bmatrix} \begin{bmatrix} +NM \\ +pl \\ +sn \\ +nt \end{bmatrix} \\ \begin{bmatrix} -sorc \\ +pl \\ +sn \\ +nt \end{bmatrix} \\ \begin{bmatrix} -sorc \\ -pl \\ +sn \\ -nt \end{bmatrix} \end{Bmatrix} \begin{matrix} III-9 \\ \\ \text{"} \\ \\ \text{"} \end{matrix}$$

mIRR'-20
$$Vo] \qquad ou]/ \begin{bmatrix} +sorc \\ +sm \\ -pl \\ -nt \end{bmatrix} \qquad III-10$$

2.7 Summary of the case-marking system of Classical Greek

The case marking system of CG consists of the case
and preposition system from the combined case inflection
and preposition tree (Figure 8) in Section 2.4 and the
nominal inflection system from the combined nominal inflec-
tion tree (Figure 16) on the following pages.

Figure 16, the combined nominal inflection tree,
integrates the nominal suffixes of Figure 15 and the
morphophonemic statements on pages 90 to 94. The rules
are the mIRR primes, repeated again in Appendix G along
with the other necessary rules needed to produce the
computer print-out of the combined nominal inflection
tree.

A brief interpretation of the symbols used might
facilitate the reading of the computer trees:

V = any vowel

oo = [ō] (ω)

ee = [ē] (η)

V̄ = any long vowel

0 = delete, null sign (this is an oval symbol, not
to be confused with the letter o which is a more
angular symbol)

+V#:i# = the vowel (V) of the stem is replaced by the
suffix -i.
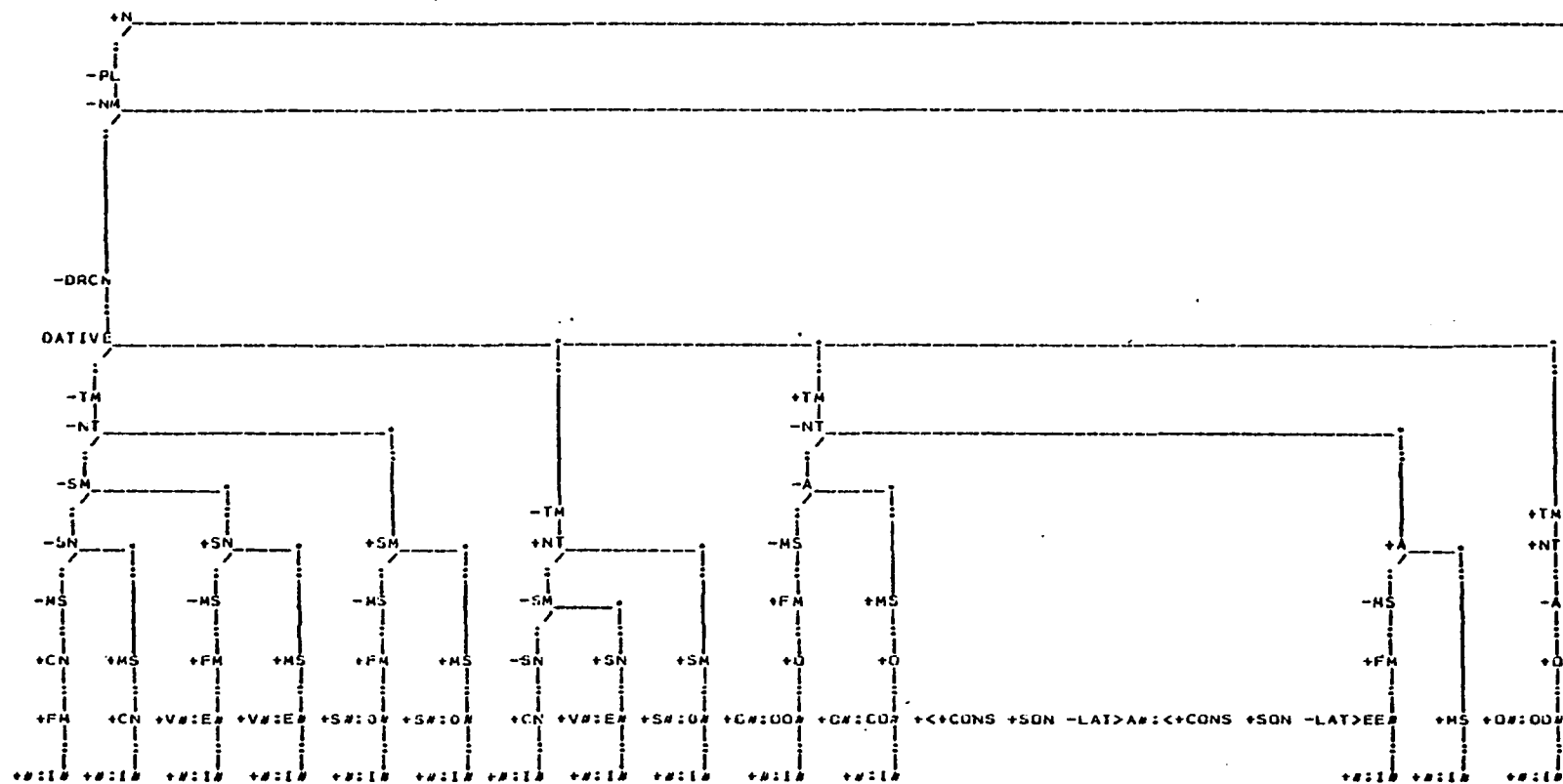
Figure 16.   Classical Greek combined nominal inflection tree.

Figure 16. Continued.

Figure 16. Continued.

Figure 16, Continued,

Figure 16. Continued.

Figure 16. Continued.

Figure 16. Concluded.
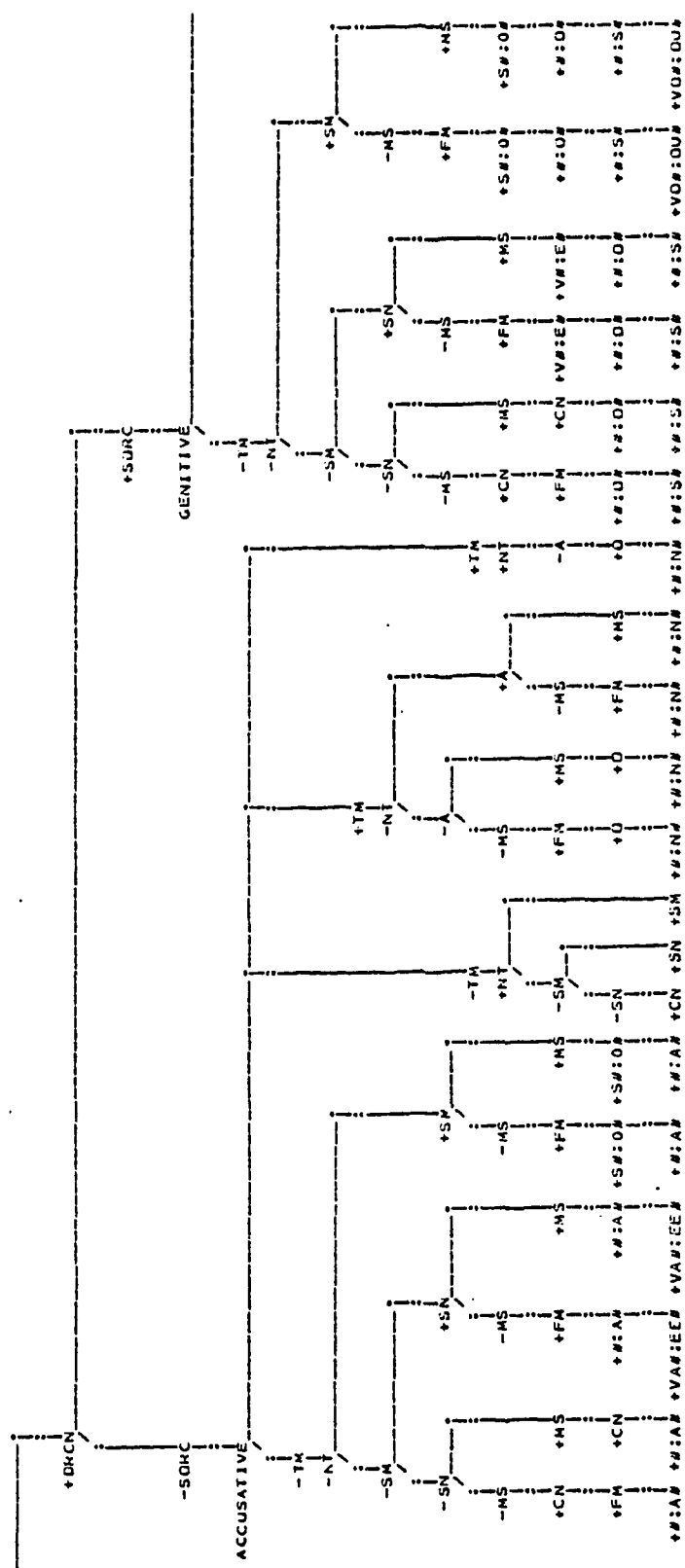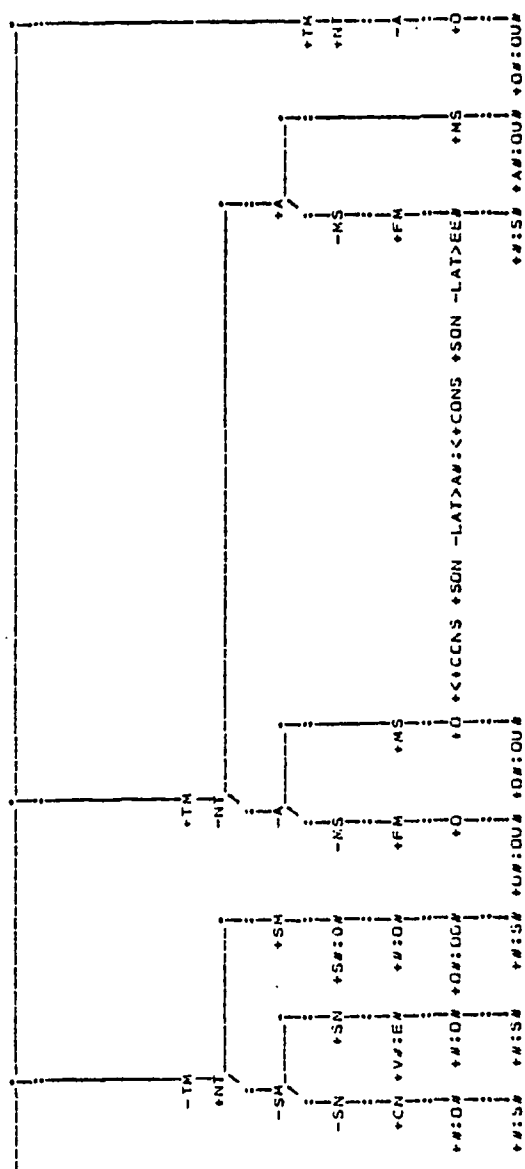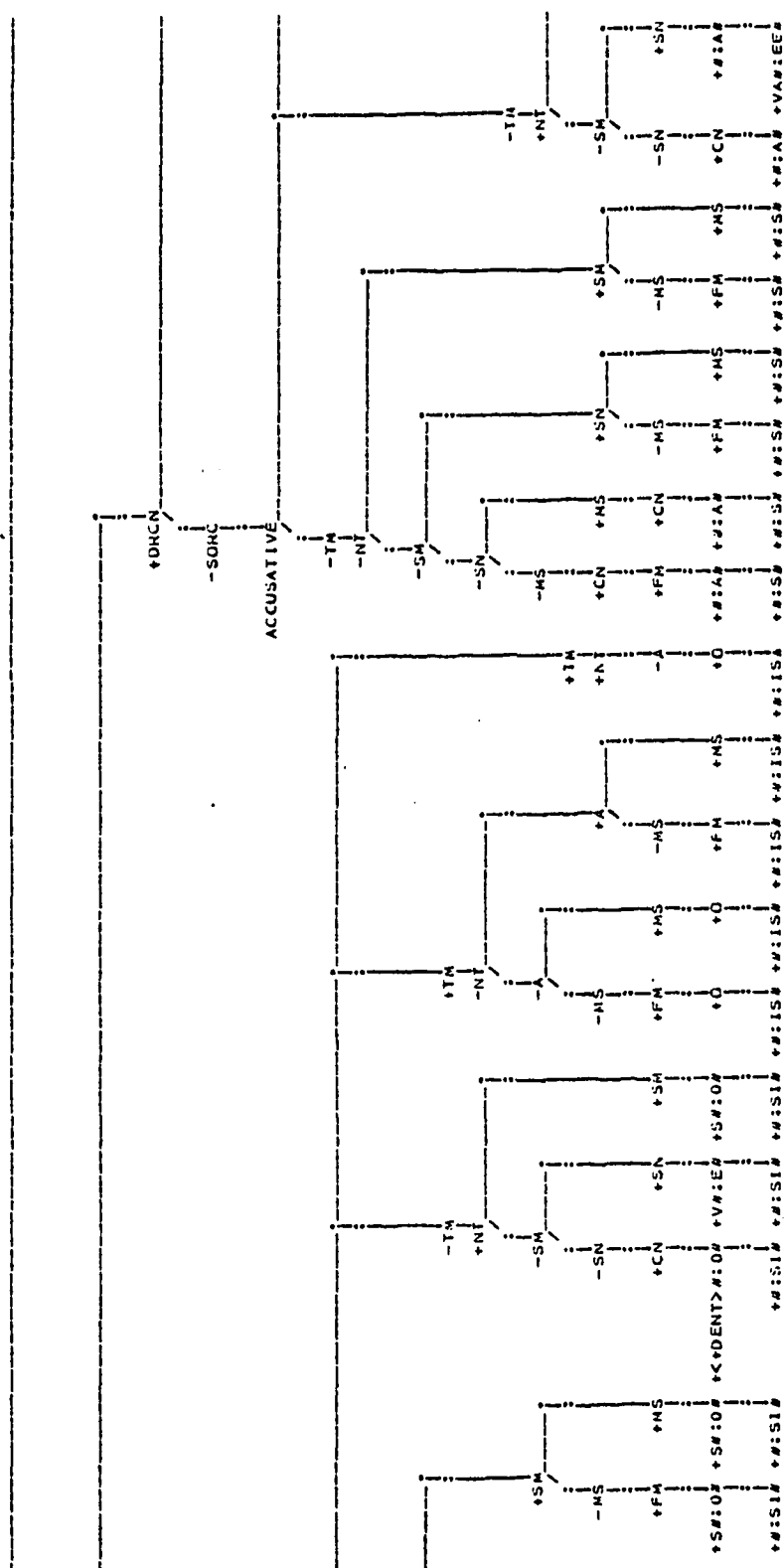
Footnotes to Chapter 2

[1]Epi can also be translated by 'onto'; epi is marked only [- sorc] in the tree and thus allows both interpretations.

[2]There are two distinct matrices for epi: 1) [+goal], 2) [-drcn].

[3]The [±vertical]prepositions are the only directly contrasting prepositions, i.e. negative vs. positive features. All other prepositions are binary: presence vs. absence.

[4]The other inflectional subsystem of the language is the verbal system.

[5]Numeration corresponds to declensional category and successive numbering of statements. mIRR' (mIRR prime) refers to the combined set of rules: i.e., the nominal suffix rules and the morphophonemic rules. This system can be matched up with the combined morphological inflectional redundancy rules on pages 103 to 108.

[6]The paradigm of the neuter article is presented for the first time; the feminine and masculine articles were presented on the preceding page.

CHAPTER 3

Diachronic Changes in the Phonological, Nominal, and
Prepositional Systems from Classic Greek to Modern
Demotic Greek

3.1 Introduction

In this chapter the changes that took place over two

millenia between CG and MDG will be discussed. The specific

phonetic and analogical changes that affect the preposi-

tional and nominal inflectional systems, and therefore,

the case-marking system, are examined with reference to

the rules. These developments are analyzed in terms of

rule change in order to understand the evolution of the

modern language from CG.

This chapter begins with a discussion of the changes

in the phonological system from CG to MDG (Section 3.2).

As mentioned in Section 1.1, one major contribution of this

dissertation is an attempt to discuss the diachronic rule

changes of Greek. The chapter continues with a discussion

of:

a) the phonetic and phonological changes from Classical to

Modern Greek with reference to their consequences for the

inflectional morphological Redundancy Rules and case

Subcategorization Rules (Section 3.3);

b) the modification in the declensional system with refer-

ence to the declensional rules (Section 3.4);

c) the changes in the surface representation of the under-
lying categories with reference to the case rules (Section
3.5); and, finally,

d) the modifications in the prepositional system and rules
(Section 3.6).

3.2 Phonological changes

There are three major modifications in the consonantal
scheme and two main changes among the vowels between CG and
MDG. Although the writing system has remained unchanged,
the phonemic systems of the two languages are not identi-
cal.

3.2.1 Consonants

Within the consonantal system, there are two major
changes: the voiceless aspirated stops become voiceless
fricatives and the voiced unaspirated stops become voiced
fricatives:

V1 aspirated stops to V1 fricatives:

CG	MDG	Greek orthography
/ph/	/f/	φ
/th/	/θ/	θ
/kh/	/x/	χ

Vd unaspirated stops to Vd fricatives:

CG	MDG	Greek orthography
/b/	/v/	β
/d/	/ð/	δ
/g/	/ǥ/ (and /j/)	γ

The chart in Table 7 represents the patterns of change.

As a result of the shifting of classes from stops to fricatives, the CG fricatives /s/ (CG and MDG: σ initially and medially; ς final) and /z/, are now joined by two series of voiced and voiceless labiodentals, dentals, palatals, and velars in MDG. The symbol ζ, which represented at one time the cluster /zd/, became /z/ in the mid-fourth century B.C., which is the way it remains in MDG.

A few examples of the phonological shifts discussed above follow:

CG	MDG	Greek writing system	Gloss
/khōrā/	/xora/	χωρα	'land'
/thalassa/	/θalassa/	θαλασσα	'sea'
/biblion/	/vivlio/	βιβλιο(ν)	'book'

Final n is lost in MDG (see Section 3.3.4). There are no 'long' segments in MDG. (see Section 3.2.2)

The other major change among the consonants from the early language to the present language is the loss of initial aspiration. In CG, initial aspiration was indicated

Table 7.

Classical Greek (CG) and Modern ᴣemotic Greek (MDG)
Consonant Correspondences

	CG MDG Bilab	MDG Lb-dt	CG MDG Dental	CG MDG Alveol	MDG pal	CG MDG Velar	CG Lary
S T O P S — Vl unasp	π/p/ π/p/		τ/t/ τ/t/			κ/k/ κ	
Vl asp	φ/ph/		θ/th/			χ/kh/	
Vd unasp	β/b/ μπ/b/		δ/d/ ντ/d/			γκ/g/ γ/g/	
F R I C S — Vl		φ/f/	θ/θ/	σ/s/ σ/s/		x/x/	/h/
Vd		β/v/	δ/d/	ζ/z/ ζ/z/	χ[ç]	γ/ɣ/	
Ḷ Q S Vd			λ/l/ λ/l/ ρ/r/ ρ/r/				
N A S Vd	μ/m/ μ/m/		ν/n/ ν/n/				
Frictionless Continuant					[j] γ/j/		
Consonant Clusters Vd Vl	ψ/ps/ ψ/ps/			τσ/c/ νζ/ᴣ/		ξ/ks/ ξ/ks/	

(The arrows represent the pattern of stops changing to fricatives.)

by a 'rough breathing mark' (ᶜ), written over an initial
segment. This mark was placed conventionally over every
initial /y/ and /r/, and could appear over any vowel,
depending on the particular word. This mark indicated
the presence of a voiceless laryngeal fricative represented
by /h/ in transcription. The initial aspiration (voiceless
fricative), /h/ no longer exists in MDG. In the ortho-
graphy, the rough breathing mark is never written over /r/,
but continues to be written over initial vowels of words
which had initial /h/ in CG, despite the lack of phonetic
value. For example, the word ἅγιος 'holy' continues to be
written with the aspiration mark in MDG. The CG transcrip-
tion would be: /hagios/, MDG: /agios/.

There is also a 'smooth breathing mark' (᾿) over
initial vowels which faces the other way, opening to the
left; it carries no phonetic value, e.g. ὄνομα, 'name',
/onoma/.

As for the remaining consinants there are no differences
in transcription and in sound value between the CG and MDG
systems:

<u>CG & MDG</u>   <u>Greek writing system</u>
The series of voiceless unaspirated stops:

  /p/   π

  /t/   τ

  /k/   κ

CG & MDG   Greek writing system

The consonant clusters:

    /ps/   ψ

    /ks/   ξ

The liquids and nasals:

    /l/   λ

    /r/   ρ

    /m/   μ

    /n/   ν

Geminates (or long consonants) that may have appeared in CG do not exist in MDG. Doubly written consonants are phonetically and phonemically short.

There are several clusters in CG and MDG that are represented or transcribed differently in the two languages, but it is not the intent of this section to describe the entire system. The discussion here is meant to facilitate the reading of the following sections and Chapter 4.

3.2.2 Vowels

The two main alterations among the vowels are

1) the coalescence of six different vowels and diphthongs in CG into one vowel /i/ in MDG, and

2) the loss of length distinctions.

2

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CG vowel chart (a macron indicates vowel length):

Monophthongs:

	front	central	back
high	ι/i,ī/		υ/u,ū/
mid-high	η/ē/		ω/ō/
mid-low	ε/e/		o/o/
low		α/a,ā/	

Diphthongs (arranged according to position of the offglide):

front	ει/ei/	αι/ai/		υι/ui/
back	ευ/eu	αυ/au/		οι/oi/
				ου/ou/[1]

The following CG vowels have all coalesced into MDG /i/:

ι, υ, η, ει, υι, and οι. For example, the preposition
ὑπό 'under' is transcribed as /hupo/ in CG and /ipo/ in
MDG (in nominal and verbal compounds only; /ipo/ no longer
functions as a preposition in isolation).

One result from this homophony is competition between
two forms, with one form being retained in its original
usage and meaning and the other form being replaced:
CG ἡμεῖς 'we' and ὑμεῖς 'you plural' were phonemically
distinct, /hemeis/ and /humeis/, respectively. In MDG
these forms would have been homophonous. The result is
that ἡμεῖς is retained and ὑμεῖς is replaced by an analogi-
cally extended form: the CG 'you singular', σύ 'thou' (MDG
/si/) has been extended to MDG ἐσεῖς /esis/ 'you plural'.

The only CG vowels which differentiated between long and short in the writing system were the pairs: ε,η and o,ω. The remaining vowels ι, υ, and α, could be either short or long, with no distinction in the writing system, though this difference was distinctive in the language. In MDG any trace of the length distinction has been lost, o and ω both represent short /o/. The distinction between ε and η differs, with ε becoming MDG /e/ ([ε]) and η becoming /i/.

Among the diphthongs, the coalescence of οι, ει, and υι to /i/ has already been discussed. The remaining 'front' diphthong, αι, coalesces with ε in the modern language and is represented in transcription by /e/, ([ε]). The back diphthongs αυ and ευ have replaced the /u/ value by [v] or [f], depending on whether the following segment is voiced or voiceless, respectively (see Section 1.2.2.2). ου is transcribed as ou in CG, but probably represented [ū] by 4th century Attic (Allen, 1974:73). In MDG this digraph represents /u/.

MDG vowel chart:

	front	central	back
high	/i/		/u/
mid	/e/		/o/
low		/a/	

3.3 Phonetic and phonological changes within the inflectional system from Classical Greek to Modern Demotic Greek

A discussion of the phonetic changes is extended to include analogical changes which have resulted from the phonetic changes in the language. Fortunately, since MDG descends from CG, the linguist has a continuous line to look along in order to trace the modifications in the system through the years. These phonetic and grammatical changes took place in the course of twenty centuries, from 500 B.C. to perhaps the 15th century, when the system had developed into a stage closely approximating Modern Demotic Greek, the form analyzed in this dissertation.

It is difficult to report these developments in chronological order because the sources for documents come from different areas: mainland Greece, Asia Minor, Egypt, and the Greek Isles.

Throughout this section the inflectional morphological redundancy rules of CG will be discussed. The modified forms of the language will be incorporated into the rule changes and the rules of MDG. Section 3.3.7 is a summary of the phonological changes and rule changes. Tables 8 and 9 summarize in chart form all the modifications, situations affected, changes effected, and rules affected.

In all the examples in this section, the CG form will be followed by the changed or 'intermediate' form. The intermediate (Int.) form may or may not be attested. It

is for this reason that it should be interpreted as a
hypothetical (asterisked) form posited as an intermediate
stage to account for the evolution of MDG from CG. The
discussion of rule changes includes a statement of the
CG rule followed by the 'intermediate' (Int.) rule.

3.3.1 Loss of final -i̱ as dative singular suffix

The loss of final -i̱ from the dative singular in all
declensions is grammatically conditioned. The loss of
final -i̱ is not a phonological change, since final -i̱ is
retained in the o̱-stem non-neuter nominative plurals
(final -i̱ is lost in the a̱-stem nominative plurals but is
replaced by another suffix: see Section 3.3.6).

Throughout Ancient Greek times and well into the
Byzantium period, Greek was written with uncial characters
in inscriptions and manuscripts. There were no word
divisions, punctuation marks, or accent marks until the
tenth century. Smyth states that "the iota...may have still
been sounded to some extent in the fourth century B.C."
(1974:13). However, the dative iota suffix continued to be
written on the line (adscript) well into the tenth century.
At that time, the use of minuscule characters was intro-
duced (see Section 1.2.2), along with the subscript form
of the dative suffix under the thematic vowels α, η, and ω
in the I and II declensions. The dative suffix of the III
declension nominals continued to be written on the same

line as the stem; these stems terminated in segments other than thematic vowels. The following examples illustrate the forms of the dative singular:

	uncial	minuscule	transcription	gloss
I decl	THIXΩPAI	τῇ χώρᾳ	tēi khōrai	'land'
II decl	TΩIPATRI	τῷ πατρί	tōi patri	'father'

This modification in the system immediately effected a change in the rules: the second matrix of inflectional marking redundancy rule number one (page 102) was lost, since it could no longer apply. There is no inflectional marking morpheme for the dative singular since the dative form is the same as the stem form. Actually, the rule is deleted for the I and II declensions only at this point, but, as will be discussed shortly, the entire dative case as well as the III declension will be lost by the MDG stage. (The first matrix of mIRR'l has nothing to do with the dative inflection; it applies to the nominative plural.)

CG mIRR-1 is replaced by: Int. mIRR-1

$$
] \rightarrow i]/ \left\{ \begin{array}{c} \begin{bmatrix} +NM \\ +pl \\ +tm \\ -nt \end{bmatrix} \\ \begin{bmatrix} -drcn \\ -pl \end{bmatrix} \end{array} \right\}
\qquad
] \rightarrow i]/ \left\{ \begin{array}{c} \begin{bmatrix} +NM \\ +pl \\ +tm \\ -nt \end{bmatrix} \\ \begin{bmatrix} -drcn \\ -pl \\ -tm \end{bmatrix} \end{array} \right\}
$$

The intermediate rule is made more complex by the addition of the [-tm] feature in the second matrix. According to the second matrix, the rule only applies to non-thematic dative singular forms. (The equivalent matrix in CG applies to all dative singular forms.)

3.3.2 Loss of distinction of length in vowels

As mentioned in Section 3.2.2, there was a short-long vowel distinction in CG. The two monophthongs for which length was distinguished in the writing system were e (short) vs ē (long) and o (short) vs ō (long):

short	long
ε /e/	η /ē/
o /o/	ω /ō/

The other length distinctions were not represented in the writing system but were apparent in meter and for placement of accent. In the grammar books (Schwyzer and Smyth), a macron indicates length (as in transcription):

short	long
α /a/	ᾱ /ā/
ι /i/	ῑ /ī/
υ /u/	ῡ /ū/

Perhaps the loss of length distinctions can be dated around the time of the adoption of the two new letters ω and ε at the time of the introduction of the Greek alphabet from Ionia in 403 B.C. Before this time o and ō were both

expressed by CG O, and e̲ and e̅ by CG H. Jannaris feels

that the Athenians never really accepted this new practice

and interchanged the symbols indiscriminately down to the

present time (1968:36ff). Whether or not Jannaris's

speculation is correct, sporadic interchanging of long and

short vowel symbols can be traced to Attic Greek.

The only inflectional marking Redundancy Rule that

distinguished a long vowel was that of the genitive plural.

The orthography does not change from MDG to CG, but the

distinction of length was lost.

CG mIRR-8 is replaced by: Int. mIRR-8

$$] \quad \rightarrow \quad \bar{o}n]/ \begin{bmatrix} +sorc \\ +pl \end{bmatrix} \qquad] \quad \rightarrow \quad on]/ \begin{bmatrix} +sorc \\ +pl \end{bmatrix}$$

3.3.3 Coalescence of vowels to /i/

Despite the frequent interchange of the symbols ε and

η in CG (Jannaris, 1968:52f and Allen, 1974:60ff), the

phonemes they represent have remained distinct down to MDG:

ε represents [ε], a mid front vowel and η represents [i], a

high front vowel. The coalescence of some of the other

vowels to /i/ seems to have been a continuing process from

the fifth century on. The coalescence of the monophthongs

and diphthongs was discussed in Section 3.2.

The impact of this vowel coalescence is felt in the

III declension. The -ι and -υ of the sonorant stems become

homophonous with the I declension feminines in -η. With

the loss of final -s̲ (see following section), the III

declension sonorants, which are retained in MDG (many words are lost or replaced), were transferred to the 2 declension feminines in MDG.[2]

Examples of the change in declensions are the following two items (all forms are nominative singular):

III decl CG form	2 decl MDG form(fm)	gloss
hē polis(fm)	i poli	'the city'
ho pēkhus(ms)	i pixi	'the forearm'

A I declension feminine in -ē which becomes a 2 declension noun in MDG can be compared:

hē nikē	i niki	'the victory'

The loss of the final -s from the nominative singular of the sonorant stems and subsequent reinterpretation of the /i/ affects CG mIRR-6: the [-sm] in the first matrix of this rule is replaced by [+cn], since according to dSR-4 [-sm] → [±sn] and RR-2 [-sn] → [+cn].

CG mIRR-6 is replaced by: Int. mIRR-6

$$
] \rightarrow s]/ \left\{
\begin{array}{l}
\begin{bmatrix} +NM \\ -pl \\ -sm \\ -nt \end{bmatrix} \\[4pt]
\begin{bmatrix} +NM \\ -pl \\ -nt \\ -a \end{bmatrix} \\[4pt]
\begin{bmatrix} +NM \\ -pl \\ +ms \\ +a \end{bmatrix} \\[4pt]
\begin{bmatrix} +NM \\ +pl \\ -tm \\ -nt \end{bmatrix} \\[4pt]
\begin{bmatrix} -sorc \\ +pl \\ -nt \end{bmatrix} \\[4pt]
\begin{bmatrix} +sorc \\ -pl \\ -tm \end{bmatrix} \\[4pt]
\begin{bmatrix} +sorc \\ -pl \\ -ms \\ +a \end{bmatrix}
\end{array}
\right\}
\qquad
] \rightarrow s]/ \left\{
\begin{array}{l}
\begin{bmatrix} +NM \\ -pl \\ +cn \\ -nt \end{bmatrix} \\[4pt]
\begin{bmatrix} +NM \\ -pl \\ -nt \\ -a \end{bmatrix} \\[4pt]
\begin{bmatrix} +NM \\ -pl \\ +ms \\ +a \end{bmatrix} \\[4pt]
\begin{bmatrix} +NM \\ +pl \\ -tm \\ -nt \end{bmatrix} \\[4pt]
\begin{bmatrix} -sorc \\ +pl \\ -nt \end{bmatrix} \\[4pt]
\begin{bmatrix} +sorc \\ -pl \\ -tm \end{bmatrix} \\[4pt]
\begin{bmatrix} +sorc \\ -pl \\ -ms \\ +a \end{bmatrix}
\end{array}
\right\}
$$

The lost feature [+sn] has no new replacement rule since the intermediate form was reinterpreted as the stem form of the i-stem neuters in MDG.

3.3.4 Final -n

Final -n seems to have been quite unstable throughout the history of the language. However, it is a very 'popular' suffix; it appears in the accusative singular

forms of all I and II declension nouns, and all non-neuter
III declension sonorants; the genitive plural for all
declensions without exception; and in all the nominative
singulars II declension neuters.

3.3.4.1 Addition of final -n

In Attic Greek, scholars recognized a 'movable -n',
which was optionally added at the end of certain verb and
noun forms when the following item began with a vowel.
This 'euphonic rule' was soon extended to positions before
pauses, at the end of clauses, and before initial stops.
From the third century B.C., final -n's were added frequently
(Jannaris, 1968:542). At this time, the overflow of final
-n's may have extended to the accusative singular of the
non-thematic stems (III declension), by analogy with the
other two declensions, where the accusative always ended
in -n in the singular.

The third declension consonant stem non-neuter accusa-
tive singular, which in CG terminated in -a, had an inter-
mediate suffixal form in -an. The probable analogical model
for the new form was the I declension, where the stem
ending in -a added -n to create the accusative singular.
This could easily have been interpreted as an ending -an
to a consonantal stem. A I declension nominal can be
compared with a III declension nominal:

	<u>nom</u>	<u>acc</u>	<u>gloss</u>
CG I decl	ho tamias	ton tamian	'the steward'
CG III decl	ho patēr	ton patera	'the father'
Int. form	*ho pater	*ton pateran	"

Sometime between Attic Greek and Modern Demotic Greek, the inflectional morphological Redundancy Rules underwent the beginning of a change for the [-sorc] (accusative) nominals.

There are two possible ways of describing the changes in the rules:

1) The second matrix of CG mIRR-4, which added an -<u>a</u> suffix to non-neuter non-thematic accusative singular nominals, can be dropped and a new rule can be created adding an -<u>an</u> suffix for this class of nouns.

2) The second matrix of CG mIRR-4 can be kept, but the CG rule (mIRR-5) which adds an -<u>n</u> suffix can be changed to include this class also.

The second choice is the preferred alternative since it results in a simplification of the rules. CG mIRR-4 is retained. The second matrix of CG mIRR-5 is altered, omitting [+tm], since it now applies to all nominals, not just thematics. The intermediate rule was actually simplified by one feature since no feature is required to specify all nominals. This kind of simplification by extension of an environment is traditionally called 'analogical leveling'.

CG mIRR-4 is replaced by: Int. mIRR-4

$$
] \rightarrow \text{a}] / \left\{ \begin{array}{l} \begin{bmatrix} +NM \\ +pl \\ +nt \end{bmatrix} \\[2ex] \begin{bmatrix} -sorc \\ -pl \\ -tm \\ -nt \end{bmatrix} \\[2ex] \begin{bmatrix} -sorc \\ +pl \\ +nt \end{bmatrix} \end{array} \right\}
$$

(no change)

CG mIRR-5 is replaced by: Int. mIRR-5

$$
] \rightarrow \text{n}] / \left\{ \begin{array}{l} \begin{bmatrix} +NM \\ -pl \\ +nt \\ -a \end{bmatrix} \\[2ex] \begin{bmatrix} -sorc \\ -pl \\ +tm \end{bmatrix} \end{array} \right\}
\qquad
] \rightarrow \text{n}] / \left\{ \begin{array}{l} \begin{bmatrix} +NM \\ -pl \\ +nt \\ -a \end{bmatrix} \\[2ex] \begin{bmatrix} -sorc \\ -pl \end{bmatrix} \end{array} \right\}
$$

3.3.4.2 Loss of final -n

Jannaris quotes sources where the earliest dislodgings of final -n are traced to the end of the Byzantine period, A.D. 1000-1450, when the final -n is added or dropped 'promiscuously and indiscriminately' (1968:549). A great deal of this adding and dropping can be attributed to unconditional phonological loss obscured by scribal spelling inconsistencies reflecting the spoken language. Jannaris felt that the reaction to the excessive adding of final -n's took place, "first in sporadic cases, then [spreading] gradually until it has finally dislodged almost every final -n" (loc. cit.).

3.3.4.2.1 Accusative singular

Perhaps concomitant with the transfer of the III
declension nominals to the other two declensions was the
dislodging of final -n from the I and II declension
accusative singulars.

With the loss of the final -n, the loss of final /i/
from the dative singular, and the coalescence of /o/ and
/ō/ to /o/, the accusative singular and the dative singular
became homophonous in the first and second declensions, and
the new combined acc-dat form was identical to the stem
form.

The articles retained the final -n, possibly because
articles were found only as the first elements of closely
knit syntactic constituents, and therefore never appeared in
phrase final position.

Following are some examples of CG forms and the
intermediate forms that began to approximate those of MDG
(singular forms):

		CG		Int.		MDG		gloss
I decl (fm)								
	dat	tei	khōrai	te	khora	–		'land'
	acc	tēn	khōran	ten	khora	tin	xora	
II decl (ms)								
	dat	toi	anthrōpoi	to	anthropo	–		'man'
	acc	ton	anthrōpon	ton	anthropo	ton	anθropo	
(nt)								
	dat	toi	dōroi	to	doro	–		'gift'
	nom/							
	acc	to	doron	to	doro	to	doro	
III decl (ms)								
	dat	toi	patri	?		–		'father'
	acc	ton	patera	ton	patera	ton	patera	

With the loss of final -n̠ from the accusative singular,
both the original mIRR-5 and the intermediate version dis-
cussed in Section 3.3.4.1, must be dropped from the set of
inflectional rules. The nominative form of the II declen-
sion neuters also lost the -n̠ suffix. All these forms were
then identical to their stem forms, and thus do not require
a rule in the lexicase framework.

The second matrix of mIRR-4 has also been lost, with
the transfer of the III declension nominals to the first
and second declensions. The remaining portion of mIRR-4
accounts for nominative plural and neuter accusative
nominals.

CG mIRR-4 is replaced by: Int. mIRR-4

$$
] \rightarrow a]/ \left\{ \begin{array}{c} \begin{bmatrix} +NM \\ +pl \\ +nt \end{bmatrix} \\ \begin{bmatrix} -sorc \\ -pl \\ -tm \\ -nt \end{bmatrix} \\ \begin{bmatrix} -sorc \\ +pl \\ +nt \end{bmatrix} \end{array} \right\}
\qquad
] \rightarrow a]/ \left\{ \begin{array}{c} \begin{bmatrix} +NM \\ +pl \\ +nt \end{bmatrix} \\ \begin{bmatrix} -sorc \\ +pl \\ +nt \end{bmatrix} \end{array} \right\}
$$

Int. mIRR-5 is replaced by: (no rule)

$$
] \rightarrow n]/ \left\{ \begin{array}{c} \begin{bmatrix} +NM \\ -pl \\ +nt \\ -a \end{bmatrix} \\ \begin{bmatrix} -sorc \\ -pl \end{bmatrix} \end{array} \right\}
$$

3.3.4.2.2 Genitive plural

The -n of the genitive plural suffix (-on) is often

lost in the modern spoken language, although it continues

to be written. The conditions for the dropping of this

final -n are not well defined, but the most consistent

environments are before stops and pauses. A further

complication is the sporadic loss of the genitive itself

in MDG. Thumb states that the genitive plural is "sometimes

limited to statements of measure, dates or particular

expressions" (1964:31) and in Northern Greek dialects

(e.g. Thessaly, Macedonia) the genitive [both singular and

plural] "has all but disappeared" (ibid:34). Perhaps it

was lost unconditionally, along with other final -n's,

but sporadically reintroduced through the influence of the

writing system.

The statements made concerning the genitive plural

could be interpreted as reason to discard the morphological

rule which states the inflectional suffix of the genitive

plural, mIRR-8. But since the form is still retained, even

though the genitive inflection occurs in a greatly reduced

range of environments as compared to CG, the rule can be

kept, but with vowel length omitted (see Section 3.3.2):

CG mIRR-8 is replaced by: Int. mIRR-8

$$] \rightarrow \bar{o}n] / \begin{bmatrix} +sorc \\ +pl \end{bmatrix} \qquad] \rightarrow on] / \begin{bmatrix} +sorc \\ +pl \end{bmatrix}$$

3.3.5 Analogical leveling of thematic vowels

Two classes of nouns within the a-stem (I) declension
were affected by analogical leveling of the thematic vowel:
1) Genitive and dative singular of the feminine a-stems,
which changed the thematic -a of the stem to -ē when the
preceding consonant was other than -r.
2) Genitive singular of the masculine a-stems, which in CG
changed to -ou by association with the -ou genitive singular
of the masculine o-stems.

The first example of analogical leveling can be
examined in the following paradigm sets: two I declension
CG nominals, one with the root in -r, the second with a
root other than -r; the third paradigm: the new form after
the paradigm leveling (loss of the morphophonemic rule);
and the final paradigm: a MDG 2 declension (after the loss
of the dative) nominal. The thematic a extends throughout
the singular of the intermediate and MDG paradigm:

SG	CG I decl [+r]	CG I decl [-r]	Int. form	MDG 2 decl
nom	hē khōra	hē thalassa	hē thalassa	i θalasa
acc	khōran	thalassan	thalassan	θalasa
dat	khōrai	thalassēi	thalassai	-
gen	khōras	thalassēs	thalassas	θalasas

| gloss: | 'land' | 'sea' | 'sea' | 'sea' |

The second example of paradigm leveling is the analo-
gizing of the thematic -a throughout the singular paradigm
of the I declension masculine nominals. A I declension
masculine noun can be compared with its modern reflex:

SG	CG I decl	MDG I decl	gloss
nom	ho tamias	o tamias	'steward'
acc	tamiai	-	
dat	tamian	tamia	
gen	tamiou	tamia	

The analogical leveling affects two CG rules: mIRR-7 and the morphophonemic rule for the dative and genitive singular of certain a-stems (mIRR'-4). The second matrix of CG mIRR-7 is lost; the entire morphophonemic rule deriving certain oblique forms is lost.

CG mIRR-7 is replaced by: Int. mIRR-7

$$] \rightarrow ou] / \left\{ \begin{array}{c} \begin{bmatrix} +sorc \\ -pl \\ +o \end{bmatrix} \\ \begin{bmatrix} +sorc \\ -pl \\ +ms \\ +a \end{bmatrix} \end{array} \right\} \qquad\qquad] \rightarrow ou] / \begin{bmatrix} +sorc \\ -pl \\ +o \end{bmatrix}$$

CG mIRR'-4 is replaced by: (no rule)

$$\begin{bmatrix} +cons \\ +son \\ -lat \end{bmatrix} a] \rightarrow \begin{bmatrix} +cons \\ +son \\ -lat \end{bmatrix} \bar{e}] / \left\{ \begin{array}{c} \begin{bmatrix} -drcn \\ -pl \\ +fm \\ +a \end{bmatrix} \\ \begin{bmatrix} +sorc \\ -pl \\ +fm \\ +a \end{bmatrix} \end{array} \right\}$$

This change is rule simplification (mIRR-7 and mIRR'-4) and rule generalization (mIRR-7). In mIRR-7, the distinctive genitive singular ending of masculine a-stems has been replaced by -a, the stem vowel, therefore there is no new rule for this change.

3.3.6 Coalescence of <u>ai</u> and <u>e</u>

The phonetic confusion between <u>ai</u> and <u>e</u> can be traced to Attic Greek times (Jannaris, 1968:53 and Lejeune, 1972: 231). Allen (1974:75f) and Sturtevant (1940:39) report later dates: Sturtevant dates the beginning of the confusion as sometime in the second century B.C., becoming common by about A.D. 150; Allen discusses the monophthongal pronunciation of <u>ai</u> as dating from about A.D. 100. Lejeune and Sturtevant both mention the 'open <u>e</u> value' of <u>ai</u> in MDG times, represented by [ε], the same as the pronunciation of MDG <u>e</u>.

The coalescence has repercussions in the plural of MDG substantives. By MDG times the CG nominative plural suffix -<u>ai</u> (stem vowel -<u>a</u> plus plural -<u>i</u>) is replaced by the -<u>es</u> (altered stem vowel -<u>e</u> plus plural -<u>s</u>) of the III declension non-neuter consonant stem nominative plural. In MDG all non-neuter nominals except the <u>o</u>-stem masculines have nominative plural -<u>es</u> (/es/).

There are several factors which seem to have contributed to an identical /es/ nominative and accusative plural in the MDG first and second declensions. In the following section, the contributing situations and the rules affected are discussed relative to the loss of the III declension and to the loss of the dative case.

3.3.6.1 I and II declension accusative and dative singular

The dative-accusative distinction is lost in the I and
II declension singular due to the following factors:

1) loss of the final -i in the dative singular,

2) loss of the final -n in the accusative singular, and

3) analogical leveling in the dative and genitive of
the I declension feminines.

As a result of a loss of distinction between the dative and
accusative singular forms, the intermediate forms came
into competition, resulting in the retention of the
accusative case inflection in MDG:

				CG	Int.	MDG
I decl	dat sg	ms		tamiai	tamia	-
	acc sg			tamian	tamia	tamia
	dat sg	fm		thalassei	thalassa	-
	acc sg			thalassan	thalassa	θalasa
II decl	dat sg	nt		dōrōi	doro	-
	nom/acc sg			dōron	doro	~~doro~~

The inflectional morphological redundancy rule changes
involved in the loss of -i from the dative singular and -n
of the accusative singular have been discussed in previous
sections (3.3.1 and 3.3.4.2.1, respectively). A phono-
logically induced loss of the distinction between the two
cases in the singular only complicates the cSR's. Inter-
mediate cSR's could be set up to reflect the loss of the
dative in the singular, but these rules would only be
eliminated and replaced by later intermediate rules reflec-
ting the loss of the dative plural as well. The loss of

the dative plural will be discussed in the next section.

3.3.6.2 I and II declension accusative and dative plural

The I declension dative plural -ais should develop to /es/ in MDG. "The fact that in the singular of the same class of nouns, the nominative, accusative, and dative have the same form combine to produce a nominative, accusative, and dative plural in -es" (Fairbanks, 1977:110).

	CG	MDG	gloss
SG			
nom	he khōra	i xora	'land'
acc	khōran	xora	
dat	khōrai	*xora	
PL			
nom	hai khōrai	i xores	
acc	khōras	xores	
dat	khōrais	*xores	

At this point, a stage can be posited at which the dative-accusative distinction was lost in the singular only, for phonological reasons, thus resulting in an asymmetry in the cSR's. When the balance was restored by dropping the distinction in the plural as well, the former dative and accusative plural forms came into conflict. The result is that the winner of this conflict was not the former accusative plural for the II declension nouns, but the former dative plural for I declension nouns:

	CG form	new form	MDG form	gloss
II decl dat pl	anthropois	anθropis	-	'man'
acc pl	anthropous	anθropus → anθropus		
I decl dat pl	tamiais	tamies	-	'steward'
acc pl	tamias	tamias ↘ tamies		

"These developments contribute to the total loss of a distinctive dative form in Modern Greek" (Fairbanks, loc. cit.).[3]

In Section 3.3.6.1, the loss of the dative singular was discussed in terms of the rules, and the development appeared to complicate the rules. But with a subsequent loss in the plural, the rules are simplified again. The reason that there is no replacement rule is that the dative category no longer exists.

The rules that predict the dative plural suffix in CG are mIRR-2 for the non-thematic stems and mIRR-3 for the thematic stems:

CG mIRR-2 is replaced by: (no rule)

$$] \rightarrow si] / \begin{bmatrix} -drcn \\ +pl \\ -tm \end{bmatrix}$$

CG mIRR-3 is replaced by: (no rule)

$$] \rightarrow is] / \begin{bmatrix} -drcn \\ +pl \\ +tm \end{bmatrix}$$

There are no specific replacement rules at this stage. Hosever, since the dative-accusative distinction is lost, the mIRR's for the accusative and dative both have the same

environment. That is, there are four rules competing for
two categories and two of them are lost. Although the -is
suffix contributes to the interpretation of the MDG accusa-
tive plural -es suffix, it is a dative suffix in CG. The
interpretation of the accusative changes too. The dative
is lost, and the genitive specializes to an adnominal rather
than a source function. With no directional and source
cases to contrast with, accusative becomes simply
non-nominal and non-adnominal. Therefore a new rule can
be posited for the case SR's.

[+NM]   →   [±adnom]

3.3.7 Summary of rule changes

The two tables on the following pages summarize the
modifications within the CG phonological system which
effected changes in the nominal inflectional system and
the case system. These alterations have resulted in a new
language, with new sets of rules. Table 8 summarizes the
phonological changes affecting the inflectional system
from CG to MDG. Table 9 continues the summary with the
rule changes.

The major change among the case subcategorization
rules is due to the loss of the dative case. This results
in a need to realign the cases and reassign features to
the remaining cases. The changes in the case rules are
stated in the lower portion of Table 9:

Table 8.

Summary of Phonetic and Phonological Changes Affecting the Inflectional System

Section	Modifications	Situations Affected	Changes Effected	CG rules affected*
3.3.1	loss of dat sg -i	I & II dat sg	I & II dat~acc sg	mIRR-1
3.3.2	loss of V length	II dat sg gen pl	II dat & acc sg ōn>on	no rule affected** mIRR-8
3.3.3	coalescence to /i/	III sonorants	III sonorants > 2 decl	mIRR-6
3.3.4.1	addition of -n	III acc sg	III > I or II	mIRR-5
3.3.4.2	loss of -n	I & II acc sg II nom & acc sg nt gen pl	dat~acc sg loss of -n ?loss of -n? (possible)	mIRR-4 & 5 mIRR-5 ?mIRR-8
3.3.5	thematic vowel leveling	I gen & dat sg	paradigm leveling in I decl sg	mIRR-9 mIRR-7
3.3.6	coalescence of ai and e	I & II acc & dat sg I & II dat pl	dat~acc sg loss of dat pl	cSR -2 & 3 {mIRR-2 mIRR-3

*See Table 9 for chart of rule changes from CG to MDG.

**No rule because this is an intermediate stage between the loss of the iota and the coalescence of acc and dat sg.

~ = similar to

Table 9.

Rule Changes in the Nominal Inflection System

Suffix		CG Rule	Change	MDG Rule
CG	MDG			
-i	-i	mIRR-1a	decl. feat.	mIRR-1
		1b	lost	-
-si		mIRR-2	lost	-
-is		mIRR-3	lost	mIRR-2b
-a	-a	mIRR-4a	none	mIRR-4a
		4b	lost	-
		4c	case feat.	mIRR-4b
-n		mIRR-5a	lost	-
		5b	generalized, lost	-
-s	-s	mIRR-6a	lost	-
		6b	decl. feat.	mIRR-2a
		6c	decl. feat.	2a
		6d	decl. feat.	2b & e
		6e	case feat.	2e
		6f	case&decl. feats.	2d
		6g	case&decl. feats.	2d
-ou	-u	mIRR-7a	case&decl. feats.	mIRR-3a & b
		7b	lost	-
-ōn	-on	mIRR-8	case feat.	mIRR-5
		cSR-1	none	cSR-1
		cSR-2 }	case feats.	cSR-2
		cSR-3		

abbreviations:
  decl. feat. = the change is in the feature label for the
                declension system
  case feat. = the change is in the feature label for the
                case system

cSR-1 remains as is into MDG;

cSR-2 and 3 are replaced with one rule, cSR-2, in MDG.
These changes will be discussed in detail in Section 3.5.

The major changes in the morphological rules revolve
around the loss of the dative case and the loss of -n as a
suffix. The loss of the dative suffix -i resulted in the
loss of half of mIRR-1; the conflicts among the nominative,
accusative, and dative plural suffixes resulted in the loss
of two rules: mIRR-2 and 3. The waxing and waning, and
eventual loss, of the -n as a suffix from the CG nominal
system accounts for the loss of one more rule: mIRR-5
(both matrices).

From a system of eight nominal suffixal rules, the
modern language emerges with five rules. Three suffixal
forms are completely dropped: -is, -si, and -n. Two
suffixal forms are modified: the length of the vowel of
the genitive plural suffix is lost: CG -ōn > MDG -on (the
last rule for both languages); -ou, which in CG is trans-
cribed as -ou, is /u/ in MDG. Neither modification to the
vowels affects the overall system.

The eight mIRR's of CG, which consist of 19 sub-rules,
are reduced to five mIRR's, with 11 sub-rules, in MDG.
Only one sub-rule of the mIRR's remains unchanged from CG
to MDG: mIRR-4a.

mIRR-1 is an illustration of how a rule can be
similar, but modified. In CG mIRR-1 there were two
environments (see below): the second matrix referring to

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[-drcn] is lost with the loss of the dative case, while the
first matrix remains down to MDG, although in an altered
form. The CG feature [+tm], which applies to all thematic
stems, is replaced by the MDG feature [+o]. The [-nt]
feature remains distinctive in both languages. In CG all
non-neuter nominative plural thematics ended in -i; in MDG
only non-neuter nominative plural o-stems (i.e. non-femi-
nines) end in -i. The feminine o-class no longer exists
in MDG; it has been absorbed by the o-stem neuters. The
two sets of rules can be compared:

CG mIRR-1   MDG mIRR-1

$$] \rightarrow i]/ \left\{ \begin{bmatrix} +NM \\ +pl \\ +tm \\ -nt \end{bmatrix} \\ \begin{bmatrix} -drcn \\ -pl \end{bmatrix} \right\} \qquad] \rightarrow i]/ \begin{bmatrix} +NM \\ +pl \\ -nt \\ +o \end{bmatrix}. $$

A comparison of the combined nominal suffixes and
morphophonemic process rules (mIRR''s) will be made
following the presentation of the combined system for
MDG, in Section 4.6.

3.4 Shifting of declensions

A chart summarizing the directions of change of the various classes and genders is presented at this point:

Classical Greek   Modern Greek

I masc   ━━━━━━━━━━━━━━━━━━━▶ 1 masc
  fem
II masc   2 fem
   fem
   nt
III masc   3 nt
    fem
    nt
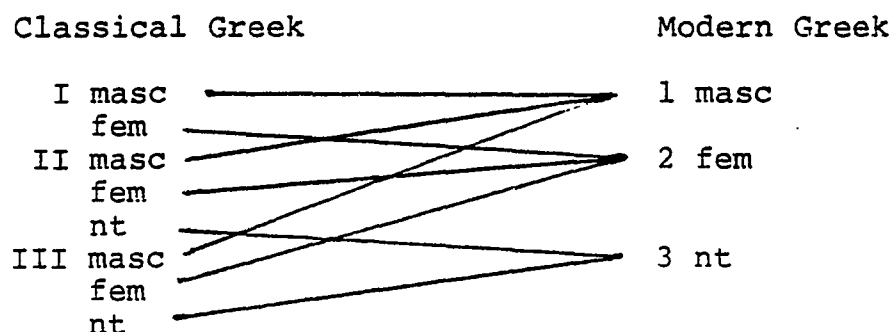
However, this chart does not reveal changes of gender which many individual items have undergone, nor does it exhibit the modern interpretation of the declensional system. This section will continue with a discussion of some of the high frequency gender and class transitions. Need will be seen for a complete reinterpretation of the declensional rules that were set up for CG in Section 2.5.2. The declensional rules for MDG will be discussed further in Section 4.5.2.

MDG nominal classifications are based solely on gender distinctions:

    1:masculine
    2:feminine
    3:neuter

The changes in the declensional system are discussed as modifications from the CG thematic/non-thematic distinction. The major change within the declensional system from CG to MDG is the shift of all the masculine and feminine nouns out of the III declension non-thematic stem class.

Some III declension neuters change gender, usually to masculine, and therefore also change decl~nsion class in MDG. The II declension neuters, a few III declension non-neuters that become neuters with the addition of a suffix, and the III declension neuters make up the 3 declension in MDG. In MDG the former thematic nominals are no longer considered or classified as thematic stems, despite the retention of the unaltered stem. This change in classification is reflected in the MDG rules.

Section 3.4.1 discusses the modifications within thematic stems; Section 3.4.2 that of non-thematics (in turn sigma, sonorant, and consonant stems). Each section is followed by a statement of the declensional rule changes.

3.4.1 Thematic stems

The CG thematic stems were masculine and feminine a-stems (I declension) and masculine, feminine, and neuter o-stems (II declension).

1) The masculine a-stems and masculine o-stems developed to the 1 declension class in MDG, which consists solely of masculine nominals.

2) The CG feminine a-stems make up the MDG 2 declension feminines.

3) Most o-stem feminines become neuters, inflected as the MDG 3 declension. The unchanged o-stem feminines are too few to include in the high-frequency patterns of this

analysis. (They pattern identically to the o-stem mascu-
lines.)

4) The o-stem neuters join the III declension neuters
and make up the 3 declension neuter category of MDG.

The following paradigms illustrate the original CG
form and category, and the corresponding MDG form and
category:

	CG I decl	MDG 1 decl(ms)	gloss
masculine	ho tamias	o tamias	'steward' (also 'cashier' in MDG)
		MDG 2 decl(fm)	
feminine	hē khōra	i xora	'land'
	CG II decl	MDG 1 decl(ms)	
masculine	ho anthrōpos	o anθropos	'man'
		MDG 3 decl(nt)	
feminine neuter	hē nēsos	to nisi	'island'
neuter	to dōron	to doro	'gift'

The forms of these nominals do not vary much from CG
to MDG, except for the basic phonological changes discussed
in Section 3.2, and the inflectional changes discussed in
Section 3.3 (loss of final -n, as in CG dōron and MDG
doro). As will be illustrated in Section 3.4.2, the forms
of non-thematic stems are greatly altered.

The changes in the declensional rules are not yet
transparent. The major change so far observed is the loss

of the subcategorization of thematic stems into a-stems and

o-stems (dSR-2). Since this division is no longer valid,

dSR-2 and the redundancy rules that include a and o as

part of the rules (RR-1 and RR-4) are lost.

These rules are replaced by a new system of classifi-

cation of the stem vowel. In MDG only the masculines and

neuters are sub-categorized into o-stems and non-o-stems.

The feminines and non-o-stems are subcategorized into

a-stems and non-a-stems.

The redundancy rule that states that non-masculines

are feminines obtains in both languages: CG RR-3 and

MDG RR-1. The rule that states the interpretation of

non-a-stems is similar in the two languages: CG RR-4

states that non-a-stems are o-stems; MDG RR-2 states that

non-a-stems are i-stems.

The following declensional rules are affected:

CG   dSR-2 $\begin{bmatrix} +tm \\ -nt \end{bmatrix} \rightarrow [\pm a]$

CG   RR-1 $\begin{bmatrix} +tm \\ +nt \end{bmatrix} \rightarrow [-a]$

CG   RR-4 $[-a] \rightarrow [+o]$

The rules needed to replace the lost CG declensional

rules could be stated as follows (dSR-1 remains, since the

[±thematic] distinction has not been discussed yet):

CG   dSR-1   [+N]   →
$$\begin{bmatrix} \pm pl \\ \pm tm \\ \pm nt \end{bmatrix}$$

Int. dSR-2   [+tm]   →   [±ms]

Int. dSR-3
$$\left\{ \begin{array}{c} [+ms] \\ \\ {[+nt]} \end{array} \right\} \rightarrow [\pm o]$$

Int. dSR-4
$$\left\{ \begin{array}{c} [-ms] \\ \\ {[-o]} \end{array} \right\} \rightarrow [\pm a]$$

CG dSR-3 and 4 are unaffected so far and become intermediate dSR-5 and 6:

Int. dSR-5   [-tm]   →   [±sm]

Int. dSR-6   [-sm]   →   [±sn]

The following changes in the redundancy rules are effected: the redundancy rules stated on the preceding page are lost, to be replaced by one redundancy rule for the non-a-stems:

Int. RR-1   [-a]   →   [+o]

The rule that states feminine as a predictable feature of non-masculines is RR-3 in CG becomes RR-2 in the inter-mediate stage:

Int. RR-2   [-ms]   →   [+fm]

3.4.2 Non-thematic stems

The loss of the non-thematic stems as a category is explained with relation to the declensional rules: first the sigma stems, then the sonorant stems, and finally the stems ending in other consonants.

3.4.2.1 Sigma stems

Sigma stems are composed mainly of neuter nouns and of
a few masculine proper names. The unchanged III declension
neuter sigma stems become low frequency 3 declension MDG
neuters (all nom sg forms):

CG III sigma stems (nt)	MDG 3 decl (nt)	gloss
to kreas	to kreas	'meat'

Most III declension neuter sigma stems and the few masculine
proper nouns are reinterpreted as 1 declension masculines:

CG III sigma stems (nt)	MDG 1 decl (ms)	gloss
to etos	o etos	'year'
to teikhos	o tixos	'wall'
ho sōkratēs	o sokratis	'Socrates'

An interesting reinterpretation occurs in the neuter
plural of the sigma stems: the nominative plural, which
terminated in -ē, was reinterpreted as singular, with
suffix -i in MDG because of the /i/ homophony (a new plural
is then formed by association with the other neuters):

	III decl (CG)	3 decl (MDG)	gloss
Nom sg	to stēthos	to stiθi	'the breast'
Nom pl	ta stēthē	ta stiθia	'the breasts'

The only traceable CG feminine sigma stem, triērēs
'trireme' is lost from the language due to the loss of
'galleys having three rows of oars'. (However, if this item
did exist, it would be a feminine 2 declension nominal.)

The loss of the sigma stems as a sub-class of the thematic stems eradicates the two subcategorization rules which incorporate the sigma stems in the matrix of the rules: CG dSR-3 and 4. These rules were not replaced in MDG, since the reinterpreted morphological forms were incorporated into the 1 and 3 declensions, as reflected in the new intermediate rules dSR-3 and 4.

The following CG rules are lost:

CG dSR-3   [-tm] → [±sm]

CG dSR-4   [-sm] → [±sn]

These rules are replaced by gender distinctions as manifested in the intermediate rules dSR-3 and 4:

Int. dSR-3   [+ms]
              {   } → [±o]
              [+nt]

Int. dSR-4   [-ms]
              {   } → [±a]
              [-o]

3.4.2.2 Sonorant stems

CG sonorant stems ended in -i̲ or -u̲ in all three genders. The -i̲ and -u̲ developed to /i/ in MDG due to the homophony of the vowels. This reinterpretation of the final vowel resulted in a reinterpretation of gender in MDG, usually into the class of feminine nominals. Many of the other nominals were lost from the language, to be replaced by synonymous terms or borrowed items from neighboring languages. The following nominals have already been

presented in Section 3.3.3 as illustrative of this change.
The examples are repeated here:

CG III sonorants	MDG 2 decl (fm)	gloss
hē polis (fm)	i poli	'city'
ho pēkhus (ms)	· i pixi	'forearm'

The loss of the sonorant stem as a class results in a
loss of the feature [+sn] in the declensional rules. CG
dSR-4 was dropped from the system in Section 3.4.2.1 with
the loss of sigma stems, which were part of the same rule.
RR-2 is also lost because of the loss of the [-sn] matrix.

The following rules are lost:

CG dSR-4   [-sn]   →   [±sn]

CG RR-2   [-sn]   →   [+cn]

These rules' are completely lost from the system, to be
replaced by the previously mentioned intermediate rules.

3.4.2.3 Consonant stems

Stems ending in consonants other than sigma stems are
the most frequent non-thematic stems. These consonants
include labials, palatal, dentals, liquids, and nasals.
Generally, the masculine and feminine nominals are found in
the expected gender in MDG, but with a change in the
morphological form, as discussed in Section 3.3.4.1, where
ho patēr illustrated the switch of declensions. The example
is repeated here along with a representative feminine
consonant stem:

	CG consonant stems	MDG 1 decl (ms)	gloss
ms	ho patēr	o pateras	'father'

		MDG 2 decl (fm)	
fm	hē thriks	i trixa	'strand of hair'

The reinterpretation of the CG dental stems into MDG creates a productive plural suffix in MDG. The CG -d-es (-d from the stem plus the plural suffix -es) has been reinterpreted as an ending in MDG. In CG the dental was lost when the nominative singular -s was affixed; in MDG the dental (an interdental in MDG, δ = /d/ in CG but /ð/ in MDG) is retained throughout the paradigm. The following is an example of a CG dental stem and its MDG equivalent in the nominative singular and plural (note that the gender is unchanged, feminine, but that the appropriate MDG nominative singular suffix, -a, is added):

	CG dental	MDG 1 declension	gloss
nom sg	hē elpis	i elpida	'hope' (fm)
nom pl	hai elpides	i elpides	

The -des plural suffix is quite productive in MDG and is added to some recently borrowed lexical items (the following examples are all 1 declension masculines):

lang. origin	nom sg	nom pl	gloss
Turkish	o keftes	i keftedes	'the meatball(s)'
Turkish	o kafes	i kafedes	'the coffee(s)'
Turkish	o barbieris	i barbierides	'the barber(s)'

A few MDG substantives have two alternate plurals:

nom sg	nom pl	gloss
o maθitís	i maθités/maθitádes	'the student(s)'
o kritís	i krités/kritádes	'the judge(s)'

It should be interesting to see whether or not one of these two competing forms will eventually become the sole plural.

There is no major change here affecting the declensional rules, since in CG the -d- was part of the stem, and in MDG this is not considered to be a major rule.

Some III declension consonant stems became 3 declension neuters in -i. The MDG neuter nominative singular suffix -i probably originated in the diminutive suffix -ion, which further reduced to -io or -i. The full -ion suffix is seen in the following hypocristic (diminutive) nominative singular forms:

	basic CG noun	gloss	dimin. noun (MDG)	gloss
II decl	ho anthropos	'the man'	to anθropion	'the mannequin'
III decl	ho/he pais	'the child'	to pedion	'the kiddie'

A few of the III declension nouns that have become 3 declension neuters in this way are (Nom sg.):

CG III decl	MDG 3 decl	gloss
ho/he pais	to pedi	'the child'
to omma	to mati	'the eye' (CG om- is
ho ther	to θirio	'the beast' dropped)
he kheir	to xeri	'the hand'

The paradigms of the neuter dentals are unchanged from
CG to MDG in all forms except the genitive singular. In
MDG, the original CG genitive form is found with an -u
rather than the expected -os, by analogy with the II
declension o-stems. Compare a II and III declension
neuter noun, with the MDG equivalent forms:

	CG II decl	MDG 3 decl	gloss
nom	to dōron	to đoro	'gift'
acc	dōron	đoro	
gen	dōrou	đoru	
dat	dōrōi	-	

	CG III decl		
nom	to onoma	to onoma	'name'
acc	onoma	onoma	
gen	onomatos	onomatu	
dat	onomati	-	

The loss of the consonant stems brings about the loss
of the non-thematic stems as a category. Not only are
rules that include the feature [+cn] in the matrix lost,
but also all rules that include [±tm], since this distinc-
tion is no longer plausible with the transfer of all [-tm]
stems to the three gender declensions of MDG. The only
rule that makes specific reference to the consonant stems
is RR-2. That rule was already designated as lost, with no
replacement, in Section 3.4.2.2.

With the loss of the [± thematic] distinctions the
entire system of declensional rules must be altered
beginning with dSR-1:

CG dSR-1 is replaced by: MDG dSR-1

$$[+N] \rightarrow \begin{bmatrix} \pm pl \\ \pm tm \\ \pm nt \end{bmatrix} \qquad\qquad [+N] \rightarrow \begin{bmatrix} \pm pl \\ \pm nt \end{bmatrix}$$

etc.

3.4.3 Summary of declensional rule changes

The following is a presentation of the two sets of rules in the two languages. Note that the only identical rules in the two languages are CG dSR-5 with MDG dSR-2 and CG RR-3 with MDG RR-1.

CG rules: MDG rules:

dSR-1 $[+N] \rightarrow \begin{bmatrix} \pm pl \\ \pm tm \\ \pm nt \end{bmatrix}$ dSR-1 $[+N] \rightarrow \begin{bmatrix} \pm pl \\ \pm nt \end{bmatrix}$

dSR-2 $\begin{bmatrix} +tm \\ -nt \end{bmatrix} \rightarrow [\pm a]$ dSR-2 $[-nt] \rightarrow [\pm ms]$

dSR-3 $[-tm] \rightarrow [\pm sm]$ dSR-3 $\left\{ \begin{matrix} [+nt] \\ [+ms] \end{matrix} \right\} \rightarrow [\pm o]$

dSR-4 $[-sm] \rightarrow [\pm sn]$ dSR-4 $\left\{ \begin{matrix} [-ms] \\ [-o] \end{matrix} \right\} \rightarrow [\pm a]$

dSR-5 $[-nt] \rightarrow [\ ms]$

RR-1 $\begin{bmatrix} +tm \\ +nt \end{bmatrix} \rightarrow [-a]$ RR-1 $[-ms] \rightarrow [+fm]$

RR-2 $[-sn] \rightarrow [+cn]$ RR-2 $[-a] \rightarrow [+i]$

RR-3 $[-ms] \rightarrow [+fm]$

RR-4 $[-a] \rightarrow [+o]$

The two major changes in the rules are first, the loss of the distinction of a-stems and o-stems in the thematic class and second, the loss of distinction of stems in the non-thematic class.

The first two MDG rules are brought about after the loss of the [±thematic] distinction in the system. All CG rules with [±thematic] in the matrices or with the stem classes of the non-thematics are replaced by MDG dSR-1 and 2. The intermediate rules set up in Section 3.4.1 to take the place of the lost rules, come down to MDG as two of the four declensional subcategorization rules (dSR-3 and 4).

3.5 Changes in the surface representation of the underlying categories

By superficial comparison of the noun paradigms of CG and MDG, it is apparent that the dative case is no longer represented in MDG. However, what cannot be derived from comparing the declensional systems is how the modern language expresses the various categories which were once represented by the dative case. In this section the present day surface representations of the underlying categories formerly expressed by the dative will be examined. In addition, there is a major change within the genitive case which must be included in the general discussion of the modern system in order to complete the picture of the correspondence between the surface cases and the under-lying categories. The following illustration will serve as a guide to the ensuing discussion:

CG Cases	Underlying Representation	MDG Cases

nom   grammatical subject ——————————— nom

dat   indirect object/experiencer
           ('dative proper')
           locative
           instrumental
           comitative
           accompaniment

acc   direct object ————————————————— acc

gen   partitive   gen
           passive
           separation
           source
           cause
           possession
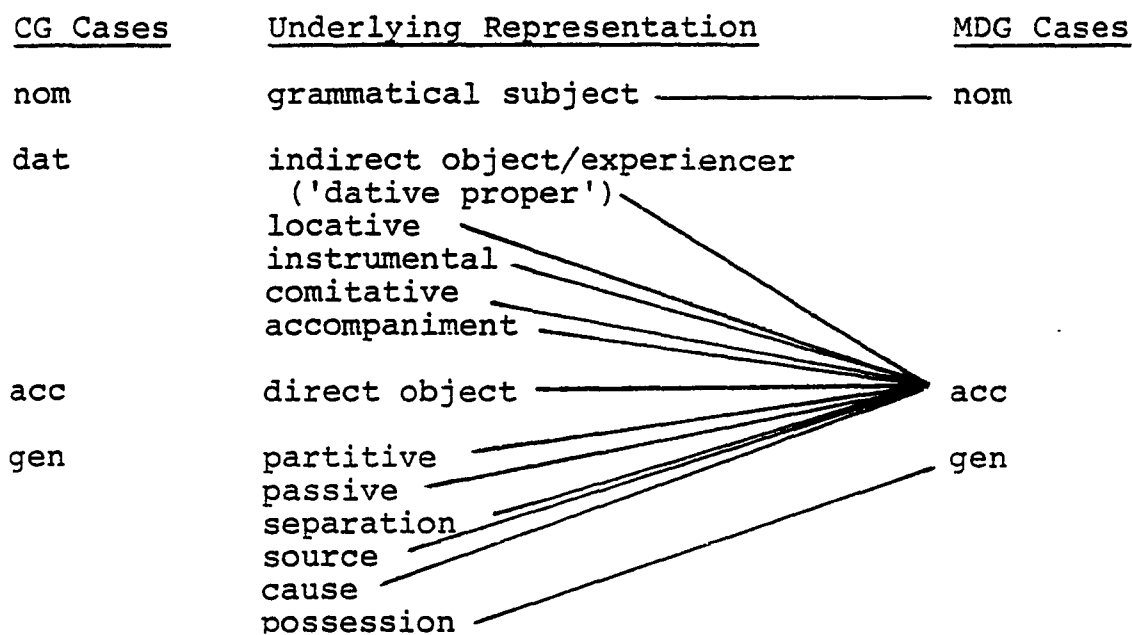
Figure 17. Changes in underlying categories.

These changes will be discussed with reference to modifications in the case rules. The changes in the functions of the case inflections are also reflected in the morphology of the language.

3.5.1 Nominative

The nominative has always represented the grammatical subject, in CG as well as in MDG.

The first case subcategorization rule of CG is unchanged in MDG, stating that all nouns are [±plural] and [±nominative]:

cSR-1 (CG and MDG):

$$[+N] \quad \rightarrow \quad \begin{bmatrix} \pm pl \\ \pm NM \end{bmatrix}$$

3.5.2 Dative

Basically all the categories represented by the
dative in CG are expressed by a preposition and a noun in
the accusative case in MDG. Most of the developments are
straight-forward, except for the benefactive, which will be
discussed first, in Section 3.5.2.1.

There are several fossilized dative forms in the modern
language, some of which are due to church influence. In the
first and second declension CG nouns, the iota-subscript
continued to be written but was no longer pronounced:

	CG transcription	MDG transcription	gloss
1.	doksa theōi	doksa θeo	'thank god'
2.	en onomati	en onomati	'in the name of'
3.	en taksi	en taksi	'O.K.' (literally, 'in order')
4.	enōi	eno	'while'

3.5.2.1 Indirect object/dative proper

The indirect object or dative proper expresses the
'experiencer'.[4] Jannaris (1968:341ff) traces the earliest
use of a preposition and a noun in the accusative with
this reading to the fourth century B.C., with the preposi-
tion _eis_ 'to'in conjunction with an accusative noun. The
following sentence is an example of a preposition and an
accusative nominal expressing the experiencer in MDG:

(3.1) <u>Edosa</u> to <u>grama</u> <u>stin</u> <u>mikri</u> (see Sec. 3.5.2.2

                         se tin   for explanation

  gave   the letter to the   of <u>stin</u>)

  (1 sg) +Det +N   +P +Det

          +acc +acc   +acc

However, an acceptable, but dialectal or perhaps sub-standard alternative in MDG is the experiencer expressed in the genitive, without a preposition:

(3.2) <u>Edosa</u> tis mikris to <u>grama</u>

  gave   the girl   the letter

  (1 sg) +Det +N   +Det +N

          +gen +gen   +acc +acc

According to Jannaris (1968:327), some dialects turned to the genitive case to represent the CG dative, while others (Constantinople, Asia Minor, and Northern Greece) would use both genitive and accusative, with "a decided preference for the double accusative". Today, the more acceptable of the two appears to be the double accusative.

3.5.2.2 Locative

The replacement of the CG locative dative 'place where', which could be expressed by a noun in the dative case, with or without the preposition <u>en</u> 'in', can be traced to the first century A.D. (Humbert, 1930:29). At that time, there arose a competition between <u>en</u> 'in' + dat and <u>eis</u> 'to' + acc. According to Humbert, the modern form was set by the fifth century A.D. In MDG, <u>eis</u> is found in reduced phonetic form, <u>se</u> or <u>s</u> + the article or in elision with the following word beginning with a vowel, as expressed in the following sentence (and in sentence (3.1)).

(3.3) meno   stin   aθina
                se tin
     live   in the   Athens   'I live in Athens'
    (1 sg)   +P +Det   +N
                +acc   +acc
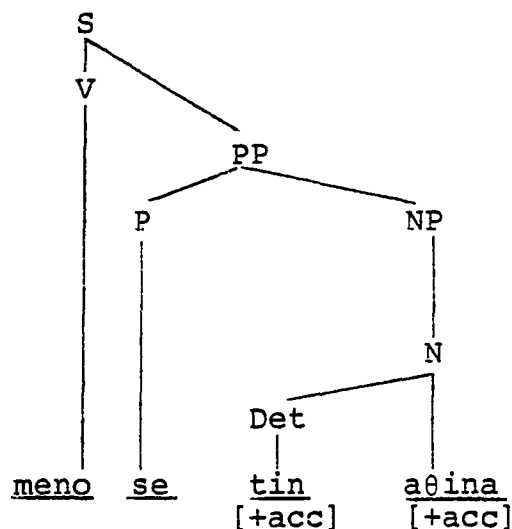
(+ MDG mIRR'-11)

In sentences (3.1) and (3.3) the preposition se and the determiner tin are written together as if they were one word. But this is only an orthographic convenience in MDG, since they are two separate lexemes, as shown in the diagram. There is a basic morphophonemic rule in MDG that the -e of se is dropped when this preposition is found with a following definite article: this is called crasis (Householder et al., 1964:12).

MDG mIRR'-11:

    se   →   s-/_ definite article that begins with t-

3.5.2.3 Instrumental

The CG instrumental dative, which includes the comitative dative, is expressed by a preposition and a noun in the accusative in MDG. Equivalents of the expression 'with something/someone' were found in various constructions in various cases with and without prepositions (Humbert,1930:99ff and Jannaris, 1968:345f). The construction in the modern language, me 'with' + a noun inflected in the accusative, is not used consistently until the seventh century, or during the Byzantine era. By the tenth century, this construction had become a high frequency formation, and has come down to the present time (Humbert, 1930:195). Me derives from CG meta 'amid' (see Section 3.6 for a more detailed explanation of the change). Me + the accusative expresses accompaniment, instrument, and manner:

(3.4) me   tin · gineka
       with   the   woman   (accompaniment)
       +P   +Det   +N
               +acc   +acc

(3.5) me   to   maxeri
       with   the   knife   (instrumental)
       +P   +Det   +N
               +acc   +acc

(3.6) me   to   zori
       with   the   force   (manner)
       +P   +Det   +N
               +acc   +acc

3.5.2.4 Dative case rules

With the loss of th: dative case inflection [-drcn],
a [±directional] dichotomy among the cases can no longer
be posited. Once the genitive case has been specialized
to adnominal uses, cSR-2 is lost, to be replaced by the
[±adnominal] distinction in the modern language.

CG cSR-2:

[-NM]   →   [±drcn]

MDG cSR-2

[-NM]   →   [±adnom]

3.5.3 Accusative

The Byzantine era, from 600 to 1450, was a period when
the accusative was taking over the many uses of the genitive
(Jannaris, 1968:338f). The history of the loss of the
dative case is variously dated, depending on dialect area:
the replacement of the dative with a preposition plus the
accusative may have begun as early as the fourth century
B.C. (Koine) in Northern Greece and Asia Minor, followed
by continental Greece and the islands, with Egypt and
Italy much later.

3.5.3.1 Modern Demotic Greek accusative

The accusative continues to represent the direct
object of a transitive verb, as in CG, but has added many
more functions: experiencer, location, and instrument from
the dative, and source, separation, and partitive

relationships from the genitive (see Section 3.5.4 for

further discussion and examples of the genitive).

Examples of the MDG accusative are to grama 'the letter'

in sentences (3.1) and 3.2), ti mikri 'the girl'(3.1), tin

aθina 'Athens'(3.3),tin gineka 'the woman' (3.4), to maxeri

'the knife' (3.5), and to zori 'the force' (3.6).

3.5.3.2 Accusative case rules

Since the [±directional] dichotomy is lost due to the

loss of the dative, the MDG subcategorization rules must be

rearranged. It is difficult to give the accusative case

one label in MDG, since it encompasses many varied func-

tions. Since the genitive case is known as the adnominal

case, the accusative will be the non-adnominal.

cSR-3 is lost since the accusative and genitive can

no longer be classified as [-source] and [+source] local

cases, respectively. These two CG rules are replaced by

one MDG rule. The set of cSR's is thereby simplified.

CG cSR-2:

[-NM] → [±drcn]

CG cSR-3:

[+drcn] → [±sorc]

MDG cSR-2:

[-NM] → [±adnom]

The case label redundancy rule in CG, which labeled the [-sorc] case as accusative, is replaced by the CG rule, which states that the [-adnom] case is the accusative:

CG clRR-3:

[-sorc] → [+acc]

MDG clRR-2:

[-adnom] → [+acc]

3.5.4 Genitive

The genitive case has survived into modern times, but with its functions reduced from CG times. In Modern Standard Greek, only the attributive is represented by the genitive. The genitive has been extended to include the function of the 'dative proper' in some dialects and to represent the pronominal form of the experiencer in the dialect of Northern Greek.

3.5.4.1 Genitive proper

The genitive proper which expressed the possessive (attributive) in CG, exists in similar semantic expressions in MDG, as exemplified in the following paired expressions:

	CG	MDG

	hē	simōnos	oikia	to	spiti	tu	giorgu
(3.7)	+Det	+N	+N	+Det	+N	+Det	+N
	+NM	+gen	+NM	+NM	+NM	+gen	+gen
	the	Simon	house	the	house	the	George

'Simon's house'   'George's house'

3.5.4.2 Ablative genitive

The ablative genitive, which in CG included the
genitives of source, separation, cause, partitive, and
comparative, is replaced by the MDG construction <u>apo</u>
'from' + accusative:

(3.8) CG   MDG

(apo) tēs agoras	apo tin agora
+P +Det +N	+P +Det +N
+gen +gen	+acc +acc
(optional prep.)	

'from the forum (CG)/market (MDG)'

3.5.4.3 Modern Demotic Greek genitive

In MDG the genitive case signals only attributive
relationships, as exemplified in the MDG portion of example
(3.7), and as in the following example:

(3.9)	to	spiti	ine	tu	patera	mu	(Householder
	+Det	+N	+V	+Det	+N	+N	et al., 1964:
	+NM	+NM		+gen	+gen	+pron	44)
	the	house	is	the	father	+gen	
						my(mine)	

'the house belongs to my father' or 'the house is my
father's'

In this dissertation, the genitive case is identified
with the feature [+adnominal].

3.5.4.4 Genitive case rules

In Section 3.5.3.2, Accusative case rules, the loss of
the CG case subcategorization rules 2 and 3 was discussed.
These two rules are replaced by one rule in MDG, based on
the [±adnominal] distinction. The genitive case is the

adnominal case in MDG, and is so represented in the MDG
case label redundancy rule:

CG cIRR-4

[+sorc]   →   [+gen]

MDG cIRR-3

[+adnom]   →   [+gen]

3.5.5 Changes in the case inflection rules

Of the three CG case subcategorization rules (cSR),
only the first one also applies in MDG:

cSR-1

[+N]   → $\begin{bmatrix} \pm pl \\ \pm NM \end{bmatrix}$

All nouns in CG and MDG are plural or non-plural (singular)
and nominative or non-nominative.

The other two CG cSR's no longer apply to MDG since
the two local dimensions of the CG cases, [±direction] and
[±source], are not part of the meaning of the MDG cases.
In MDG, all the directional and locational features are
instead carried by the preposition, which must occur with
a noun in the accusative case.

A comparison of the two sets of rules, CG and MDG,
is presented here. The MDG case rules will be discussed
further in Section 4.3.2.

CG   MDG

cSR-1   [+N]   → $\begin{bmatrix} \pm pl \\ \pm NM \end{bmatrix}$ cSR-1   [+N]   → $\begin{bmatrix} \pm pl \\ \pm NM \end{bmatrix}$

cSR-2   [-NM]   →   [±drcn]   cSR-2   [-NM]   →   [±adnom]

cSR-3   [+drcn]   →   [±sorc]

The following is a comparison of the case label rules (not part of grammar-proper):

clRR-1   [+NM]   →   [+nom]   clRR-1   [+NM]   →   [+nom]

clRR-2   [-drcn]   →   [+dat]   clRR-2   [-adnom]   →   [+acc]

clRR-3   [-sorc]   →   [+acc]   clRR-3   [+adnom]   →   [+gen]

clRR-4   [+sorc]   →   [+gen]

3.6 Changes in the prepositional system from Classical Greek to Modern Demotic Greek

The major change in the prepositional system from CG to MDG is the evolution of a syntactic division of 'simple' and 'sequential' prepositions. The CG system has only 'simple' prepositions, in that only one preposition can occur in a prepositional phrase. The MDG system contains not only simple prepositions, but, in addition, 'sequential' prepositions. In MDG, a prepositional phrase can consist of one preposition (simple) or two or three prepositions (sequential). Sequential prepositions are sequences of a de-adverbial preposition followed by a 'simple' (or 'secondary') preposition, usually se 'in, at, to'. Such sequences do not form constituents, however. Rather, they occur in complex prepositional phrases having the following constituent structure:

```
                    PP
              _____|_____
             P            PP
             |         ___|___
             |        P       NP
             |        |        |
          mexri      se        |
                               |
```
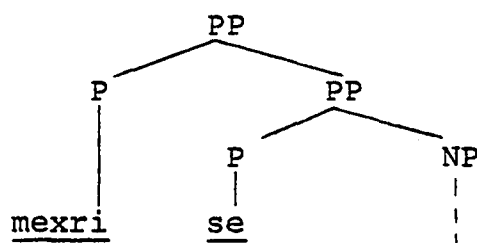
The syntactic system and Phrase Structure Rules for MDG

will be discussed in Section 4.2.

Jannaris states that during Mediaeval times (approxi-

mately A.D. 1000 to 1453), most CG simple prepositions

were on the wane. The use of the following prepositions

came to an abrupt end around that time (1968:365ff):

ana	epi	sun	huper	(see Appendix D for
en	meta	hupo		glosses)

The use of the following prepositions continued for a few

more centuries (no longer found in MDG):

ek   peri   pro   pros

Jannaris adds that continued use of these prepositions was

due to "scholastic zeal and Biblical influence" (1968:366).

The equivalent CG construction to the MDG sequential

prepositional phrase can be traced to Attic Greek times.

Smyth mentions that 'improper' prepositions [adverbs] may

be used with 'true' prepositions [simple] (1974:367). He

gives the following example from Xenophon:

(3.10)	mekhri	eis	to	stratopedon	(X.A. 6.4.26)
	+Adv	+P	+Det	+N	
	as far	as to	+acc	+acc	
	(up to)		the	camp	

'as far as (into) the camp'

Mekhri eis is the equivalent of MDG mexri se 'up to'.

Thumb relates that the 'improper' prepositions are relatively new formations, but adds that they are derived from CG 'material' (1964:107). He assigns the following distinctions to the secondary preposition:

"'s [se] expresses a simple statement of proximity
          or approach,
apo a definite standpoint or point of departure,
me distinct accompaniment or connection"

Epano + eis is one of the few sequential prepositions that Jannaris discusses. He claims that epi was used until 1000-1450 due to Atticists or scholastic zeal, despite the replacement by epano since A.D. 300, "which at still later times is often accompanied by the preposition eis" (1968: 383).

Jannaris traces the use of apo before adverbs of place and time to A.D. 300 with the genitive replacing the accusative sometime during the period 150 B.C. to A.D. 600. The examples he gives are apo kato 'under', and apo pano 'over' (1968:372f).

Of the eighteen CG prepositions represented in Chapter 2, only six prepositions come down to MDG totally unchanged in form. Of these six prepositions, only one is semantically identical; the remaining five are semantically similar, often by means of a metaphorical extension from the CG semantic construction (Section 3.6.1). Four more MDG prepositions are also descendants of CG prepositions, but their forms have undergone phonetic modifications

(Section 3.6.2). The remaining MDG prepositions are etymologically derived from CG adverbial forms (Section 3.6.3).

In the following sections, the MDG prepositions will be traced back historically with reference to morphological form and to semantic interpretation. Table 10 lists the corresponding prepositions from CG to MDG.

3.6.1 Unchanged prepositions

The six prepositions unchanged orthographically from CG into MDG are: apo, pros, para, anti, meta, and kata (see Appendix D for glosses). Only one preposition, apo, is unchanged in semantic content. But even this preposition no longer appears in the same position in the case-marking system: in CG apo is found only with a genitive nominal, but in MDG with an accusative nominal (since all MDG prepositions are accompanied by accusative nominals in the case-marking system). The same relationship holds true for anti 'before', which takes the genitive in CG, but accusative in MDG. The other CG prepositions appeared with a genitive or accusative nominal (meta and kata) or with a nominal in any of the three oblique cases (pros and para). Perhaps in these latter four prepositions, the preposition plus the accusative nominal can be thought of as a retention, related to the loss of the dative and genitive as preposition-accompanying case inflections.

However, it must be remembered that the localistic meaning carried by the accusative case is no longer present in the modern reflexes.

The individual changes in the semantic function of each preposition are discussed below:

apo 'from', as previously mentioned, has come down totally unchanged in appearance and in semantic content. The only change from CG is the occurrence with a nominal in the accusative (rather than genitive) case, as with all MDG prepositions.

pros, by extension of the CG preposition pros 'by, near', plus an accusative nominal, means 'towards' in MDG. In other words, the CG construction (pros plus the accusative) is retained; the other uses of pros are lost along with the cases that signaled them.

para is used in time expressions in MDG; for example 'of' in 'it's a quarter of one' is rendered by para. Para is also used to mean 'almost', 'although', and 'in spite of'.

anti appears to be equally idiomatic; in MDG it translates as 'instead of'. In CG anti meant not only 'before', but also 'opposite, in the face of'. Two historically related MDG forms, both meaning 'opposite', apenanti and antikri, derive from CG anti 'opposite' (see Section 3.6.3).

kata, CG 'down' or 'down along' is translated as 'according to' in MDG. The MDG meaning is retained from the use of

kata + the accusative case inflection in its metaphorical
extension in CG. This usage is very popular in New Testa-
ment Greek. There are many idiomatic expressions with kata
that are not easily rendered by one word in English.
Glosses for kata include 'depending on', 'by', 'towards',
and 'down to'.

meta has lost the CG meaning of 'amid' (but cf. me, Section
3.6.2) and has taken on the metaphorical extension of the
CG meta + accusative case inflection 'into the midst', in
the sense of 'going after something else'. In MDG meta
has come to mean 'after', in the sense of time sequence.

3.6.2 Prepositions with phonetic modifications

The four prepositions which are also directly descended
from CG prepositions, but which have changed phonologically,
are MDG me, ja, se, and mazi. They derive from CG meta,
dia, eis, and hama+syn.

me 'with' is an atrophied form of CG meta 'amid, with'.
Through the years, the -ta was reinterpreted as the plural
definite article, ta, and eventually was lost through
haplology.

ja 'for' is a development of the phonological change of
CG /d/ to the glide /j/ when followed by /i/. A trans-
literation of the MDG orthographic form brings it closer
to the CG: {jia}.

se 'to, at, in' derives from CG eis 'to', which in turn
derives from *ens 'in, to'. Eis would come down as /is/ in
MDG but the initial vowel is lost. Andrioti's etymological
dictionary states that the -e comes from the close associa-
tion with following words beginning with e-, e.g. 's emena
'to me', 's ena 'to one', 's ekinon 'to that one' (1967:
320).

mazi 'with' is composed of CG hama, adverb and preposi-
tion meaning 'together with' or 'at once', and CG syn
'amid, with'. The phonological changes leading to the
modern preposition are possibly as follows (not necessarily
in chronological order):

initial /h/ is lost	/hamasyn/
	amasyn
initial /a/ is lost	masyn
final /n/ is lost	masy
/y/ becomes /i/	masi
intervocalic /s/ voices	/mazi/

3.6.3 Prepositions derived from adverbs

Many modern prepositions derive from CG adverbs,
serving both as adverbs and as prepositions in the modern
language. As defined in Section 1.6.6, a preposition is
the word that occurs in exocentric construction with an
NP, forming a PP, with a [+P] feature in the lexical
matrix. An adverb is a word that can function as a non-head
immediate constituent of both a sentence, S, and a noun

phrase, NP. An adverb has the feature [+Adv] in its lexical feature matrix.

The de-adverbial prepositions can be sub-divided into three groups:

1. MDG preps < CG adverbs < CG preps

2. MDG preps < CG adverbs < CG nouns

3. MDG preps < CG adverbs

One group of MDG prepositions that derives from CG adverbs can be traced back to CG prepositional forms. These MDG prepositions include apenanti, epano, ekso, kato, and brosta (see Appendix D for glosses):

apenanti is composed of CG apo 'from', en 'in', and anti 'before'. The /o/ of apo is lost due to the elision with the /e/ of en. As a CG adverb and as the MDG preposition, apenanti translates as 'opposite'.

epano derives from the fusion of CG epi 'on' and anō, the adverbial form of the preposition ana 'up'. When followed by se, epano se means 'on, on top of, up'; when followed by apo, epano apo translates as 'over, above'.

ekso derives from the adverbial form of ek (eks before vowels) 'from'. It is defined as 'outside of' in MDG.

kato is the adverbial form of kata 'down'. When followed by se (kato se), it translates as 'down'; when followed by apo (kato apo), it renders the English 'under, below'.

brosta is a reduced form of the fused preposition empros. Empros derives from the fusion of CG en 'in' and pros 'by,

near'. The initial b- in brosta comes from the assimilation of the voicing from the nasal to the following voiceless stop.[5] The suffix -ta of brosta is a low frequency adverbial suffix in CG and MDG. Brosta means 'in front of, before'.

A second group of MDG prepositions that is also historically derived from CG adverbs can be traced to CG nominal forms. The MDG de-nominal prepositions: giro, konta, and mesa.

giro 'around'; giro derives from the CG nominal giros 'circle, ring'.

konta 'near'; konta is etymologically the adverbial form of the CG kontos 'pole'.

mesa 'inside'; mesa derives from CG mesos 'middle'.

The de-adverbial prepositions that remain were also adverbs in CG. These items are as follows:

xoris 'without'.

antikri 'opposite'; synonymous with apenanti.

piso 'behind'; a shortened form of the CG adverb opisō.

mexri 'up to'.

3.6.4 Corresponding prepositions: Classical Greek and Modern Demotic Greek

Table 10 is a summary of the change in CG prepositions to MDG times. This is not a listing of all the prepositions found in MDG. Rather, this table lists the CG

prepositions and their functional counterparts in MDG. If
the morphological shape exists in MDG, but there has been
a semantic shift, then the MDG preposition is listed one
step down from the CG preposition with the MDG meaning in
quotation marks. This table includes the low frequency
MDG prepositions that are found only in set phrases or
idioms (see Section 3.6.1), since they are directly
descended from the CG prepositions. The entire system of
MDG prepositions will be discussed in Section 4.4.

Table 10.

Corresponding Prepositions: Classical Greek and Modern Demotic Greek[6]

Gloss	CG Prepositions	MDG prepositions (similar to CG)*	(no corresponding CG prep)
with, amid	sun meta	mazi me meta 'after'	
by, near	pros para	pros 'towards' para 'almost, of'	konta se
around	amphi peri		giro se
on	epi	epano se	
in	en	-	⎧mesa se 'inside(of)' ⎨se 'in, at, to'
through	dia	ja 'for'	apo
before	pro anti	anti 'instead of'	brosta se antikri 'opposite' apenánti "
to	eis	se 'to' se 'at, in'	
from	apo ek, eks	ekso apo 'outside of'	apo
over	huper		epano apo
under	hupo		kato apo
up	ana	epano se	
down	kata	kato se kato 'according'	

*One step down indicates a semantic shift from CG to MDG, with the MDG meaning in quotation marks.

Footnotes to Chapter 3

[1]See footnote number 2, Chapter 1.

[2]A brief description of the MDG system might be helpful at this point (the MDG declensional pattern will be discussed in detail in Section 3.4):

    1 decl: ms
    2 decl: fm
    3 decl: nt

Also note the use of Arabic numerals for the MDG declensional system (vs. Roman numerals in CG).

[3]There are puristic-minded Greeks who have attempted to reform the spelling of the nominative plural of the a-stems to -ais. In their view this will conform to the 'original' Classical Greek form!

[4]'Experiencer' is sometimes referred to as 'benefactive'. The use of benefactive is reserved for the following semantic construction:

    'I brought the letter for John.'
                        [+ benefactive]

[5]The sequence μπ is /b/ initially, but /mb/ medially, therefore: /embros/ vs. /brosta/.

[6]This table does not include the MDG preposition that have no corresponding prepositional form in CG, i.e. xoris 'without', piso 'behind', and mexri 'up to'.

CHAPTER 4

The Case-Marking System of Modern Demotic Greek in a
Localistic-Lexicase Framework

4.1 Introduction

This chapter is a synchronic view of the nominal
inflectional and prepositional system of Modern Demotic
Greek in the localistic-lexicase framework. The format of
this chapter parallels that of Chapter 2, the
analysis of CG, but in reverse order from that of Chapter
3. Chapter 3 presented a discussion of the changes in the
phonological system with relation to the emerging rules and
system of MDG. The major change in the system was the loss
of the dative case through phonological changes and eventual
competing morphological forms and the loss of local semantic
features from the remaining oblique case inflections. The
resultant surface replacements of the underlying categories
were discussed with relation to the loss of the dative as a
surface category. The changes in the prepositional lexicon
were explained with reference to the system in MDG. All
the results of these modifications will now be discussed
within the localistic-lexicase analysis.

Examples are taken from several sources: two Modern
Greek writers, Vasiliku, 1973 and Kaliotsu, 1971; a grammar
by Householder et al., 1964; and myself.[1]

4.2 Modern Demotic Greek prepositional system

The MDG prepositional system is composed of the prepositions discussed with reference to their etymology in Section 3.6. These prepositions are either simple prepositions derived from CG or de-adverbial prepositions derived from CG adverbs or from the fusing of two or three CG prepositions.

This section will discuss the MDG prepositions as single words. The use of MDG prepositions in sequence will be discussed in Section 4.4. Konta 'near' illustrates the rule of a preposition used alone when followed by a clitic (or short-form) pronoun inflected in the genitive case (example (4.1)) and in sequence in the combined case-marking system (Section 4.4) when followed by a long-form pronoun or a nominal inflected in the accusative case (example (4.2)):

(4.1) katse   konta   mu
      +V   +P   +N
      sit   near   +pron(clitic)
        (2 sg)   +gen
                              me

      'Sit near me.'

(4.2) <u>katse   konta se   mena</u>

$$\underbrace{\overline{\text{+P}}\qquad\overline{\text{+P}}}\qquad \overline{\text{+N}}$$

+V   +pron (long-form)

sit   near   +acc

                       me

'Sit near me.'

```
                              S
                              |
                         V         
                         |    \        
                         |      PP
                         |     /  \
                         |    P    PP
                         |    |   /  \
                         |    |  P    NP
                         |    |  |    |
                         |    |  |    N
                         |    |  |    |
                       katse konta se mena
```
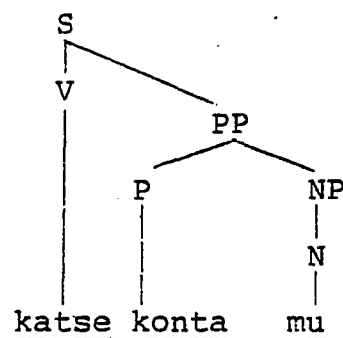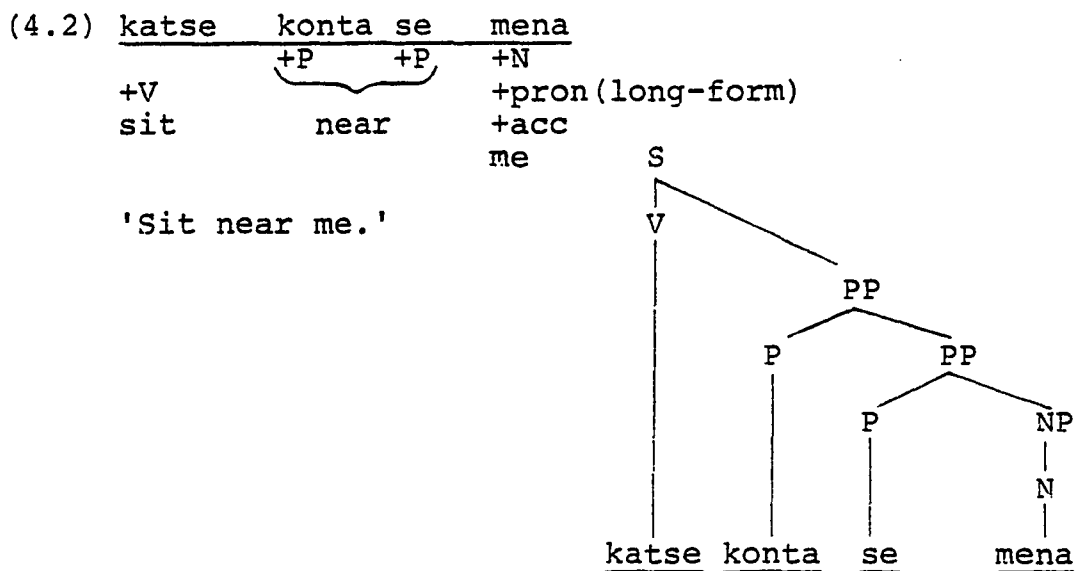
The trees that illustrate the two systems are based on the following Prepositional Phrase Structure Rule:

$$\text{PP} \rightarrow \text{P} \begin{Bmatrix} \text{NP} \\ \text{S} \\ \text{PP} \end{Bmatrix}$$

This rule is a revision to previous analyses (Clark, 1978) using the lexicase framework. The change is the addition of the PP category to the Prepositional PSR. In previous analyses, the rule was as follows:

$$\text{PP} \rightarrow \text{P} \begin{Bmatrix} \text{NP} \\ \text{S} \end{Bmatrix}$$

Section 4.2.1 discusses the system of one-word MDG prepositions as in sentence (4.1); Section 4.2.2 sets up a preposition tree similar to the CG preposition tree in Figure 3; and Section 4.2.3 presents the preposition Subcategorization Rules.

4.2.1 Prepositions

There are two types of prepositions in MDG, those that
function only as prepositions and those that have homophonous
adverbial counterparts.

The 'pure' prepositions are those that have no adverbial
counterparts. They are as follows:

```
se 'in, to, at'
apo 'from'
ja 'for'
me 'with'
pros 'towards'
mexri 'up to'
xoris 'without'
```

The remaining prepositions have homophonous adverbial
counterparts. Historically, all these prepositions are
derived from adverbial forms, therefore they are referred
to as de-adverbial prepositions. Of the 'pure' prepositions,
mexri and xoris are also derived from adverbs, but their
historical sources have been lost from the modern language.
In order to derive these prepositions from adverbs, an
analogical derivation rule can be set up:

ADR-1 $\begin{bmatrix} + \text{Adv} \\ -\text{manner} \end{bmatrix}$ >→ [+P]

```
e.g.   konta      >→   konta
       [+Adv]          [+P]
```

Sentences (4.1) and (4.2) illustrate the use of konta
'near' as a preposition. The following sentence and tree
diagram illustrate the use of konta as an adverb:

(4.3) <u>ine</u>   <u>konta</u>
     +V   +Adv
     is   near
      (3 sg)

     'It is near.'

```
                    S
                    |‾‾‾‾‾‾‾‾\
                    V         \
                    |          Adv
                    |          |
                   ine        konta
```
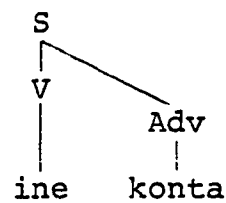
An adverb can be defined as a word (a minimal syntactic unit) that can function as a non-head immediate constituent of both a sentence (S) and a noun phrase (NP).

The prepositions that have homophonous adverbial counterparts are as follows:

konta 'near'
giro 'around'
mazi 'with'
epano 'on, on top of, up, over'
ekso 'outside'
mesa 'inside'
piso 'behind'
brosta 'in front'
apenanti 'opposite'
antikri 'opposite'
kato 'down, under, below'

4.2.2 Preposition tree

Figure 18 is the MDG preposition tree. It is similar to the CG preposition tree, Figure 3, with the following modifications on the MDG tree:

1. The addition of three new features in MDG, [±prolative], [±terminus], and [±path], to account for the [+prolative] prepositions <u>ja</u> 'for', <u>pros</u> 'towards' and <u>mexri</u> 'up to', which also fit into the [-assn] category.

2. The loss of the [±intimate] distinction among the [-comitative] prepositions.

+P

-N

-reln   +reln

-surf   +surf   -vert   +vert

-assn   +assn   -side   +side   -prox   +prox   -nter +nter

-prol   +prol   -comt   +comt   -nter +nter   -intm +intm

-sorc +sorc -term +term   -circ +circ -sorc +sorc

-path +path

se   apo   ja   pros   mexri   konta   giro   mazi   xoris   epano   ekso   mesa   piso   brosta   apenanti   epano   kato

me

antikri

in, to, at   from   for   toward   up to   near   around   with   without   on, on top of   outside   inside   behind   in front of   opposite   up, over, above   down, under, below

Figure 18. Modern Demotic Greek preposition tree.

3. The addition of the [±source] distinction on the [+comitative] branch, needed to include the MDG preposition <u>xoris</u> 'without'.

4. The addition of the feature [±side] to account for the prepositions <u>ekso</u> 'outside' and <u>mesa</u> 'inside'.

5. The addition of the feature [±proximate] to account for the preposition <u>piso</u> 'behind'.

6. The loss of the feature [±surface] from the [+reln] branch. This is due to the semantic collapse of the CG prepositions <u>ana</u> 'up' and <u>hyper</u> 'over' to MDG <u>epano</u>, which also means 'on'; and the corresponding semantic collapse of the CG prepositions <u>kata</u> 'down' and <u>hypo</u> 'under' to MDG <u>kato</u>.

Fourteen features are needed to describe the prepositional system of MDG. MDG adds five new features: [±prolative], [±terminus], [±path], [±side], and [±proximate] to the nine features used for the CG system.

The feature [±prolative] is an added distinction on the [-assn] branch of the preposition tree in order to distinguish the prepositions with an inherent sense of 'extension' or 'longitudinal extent'. RR-1 (next section) states that [+prol] → [+goal]. The [+prol] prepositions are <u>ja</u> 'for', <u>pros</u> 'towards', and <u>mexri</u> 'up to'. The [-prolative] prepositions are the same two prepositions which constituted the entire [-assn] branch in CG: CG <u>eis</u> and <u>apo</u> vs. MDG <u>se</u> and <u>apo</u>.

The feature [±terminus] is a distinction among the [+prolative] prepositions. [+terminus] implies an end point, as the preposition <u>mexri</u> 'up to'.

The third new feature in MDG is [±path], a subclassification of the [-terminus] prepositions. [+path] distinguishes a preposition that implies a route, as the preposition <u>pros</u> 'towards'.

The next feature [±side] is applicable to MDG, but not to CG. It is found under the next major branch of the tree, [-reln, -surf]. [+side] includes the MDG prepositions that translate with the English suffix '-side', as in 'inside' and 'outside', MDG <u>mesa</u> and <u>ekso</u>, respectively.

The final new feature added to the inventory of prepositional features is [±proximate]. [+proximate] prepositions are those that indicate closeness to the speaker/perceiver (cf. [+reln]). The [+prox] prepositions, <u>brosta</u> 'in front of', <u>apenanti</u> 'opposite', and <u>antikri</u> 'opposite' occur in between the perceiver/speaker and the object in the prepositional phrase.

4.2.3 Preposition rules

The preposition rules are based on the preposition tree in Figure 18. There are sixteen subcategorization rules and one redundancy rule that account for the prepositional system of MDG.

The MDG preposition Subcategorization Rules characterize the subclasses of the MDG prepositions according

to the local features in the preposition tree. The one redundancy rule is needed to account for the local feature [+goal].

The MDG pSR's are discussed with reference to the CG pSR's, therefore the CG pSR's and MDG pSR's are presented here side by side for ease of comparison:

CG pSR-1 $\begin{bmatrix} -N \\ +P \end{bmatrix}$ → [±reln]   MDG pSR-1 $\begin{bmatrix} +N \\ +P \end{bmatrix}$ → [±reln]

-2 [-reln] → [±surf]   -2 [-reln] → [±surf]

-3 [-surf] → [±assn]   -3 [-surf] → [±assn]

-4 [-assn] → [±sorc]   -4 [-assn] → [±prol]

    -5 [-prol] → [±sorc]

    -6 [+prol] → [±term]

    -7 [-term] → [±path]

-5 [+assn] → [±comt]   -8 [+assn] → [±comt]

-6 [-comt] → $\begin{bmatrix} ±circ \\ ±intm \end{bmatrix}$ -9 [-comt] → [±circ]

    -10 [+comt] → [±sorc]

-7 [+surf] $\begin{bmatrix} ±sorc \\ ±nter \end{bmatrix}$ -11 [+surf] → [±side]

    -12 [+side] → [±nter]

-8 [+reln] → [±vert]   -13 [+reln] → [±vert]

-9 [-vert] → [±intm]   -14 [-vert] → [±prox]

    -15 [+prox] → [±intm]

-10 [+vert] → $\begin{bmatrix} ±surf \\ ±nter \end{bmatrix}$ -16 [+vert] → [±nter]

    RR-1 [+prol] → [+goal]

The semantic differences and parallels between the CG and MDG prepositional system are reflected in a comparison of the two sets of rules.

pSR's:	identical		similar		new
	CG	MDG	CG	MDG	MDG
	1	1	4	4,5	6
	2	2	6	9	7
	3	3	7	11,12	10
	5	8	9	14,15	
	8	13	10	16	

The identity of the first two pSR's in the two languages reflects the fact that both languages have the same major categories for the prepositions: [±reln] and [±surf].

pSR-3 is the same in the two languages, reflecting the same subcategorization for the [-surface] prepositions into [±assn]. Further subcategorization is dissimilar between the two languages. MDG pSR-4 and 5 are expanded versions of CG pSR-4, due to the MDG feature [±prolative] needed to classify prepositions that are also [-assn] in MDG. The MDG rules continue with two new additional rules pSR-6 and 7, needed to distinguish the [±prolative] prepositions from each other. CG pSR-5 is identical to MDG pSR-8 subcategorizing the [+association] prepositions into [±comitative] prepositions. In CG, pSR-6 states that the [-comitative] prepositions are subcategorized into the features [±circumambient] and [±intimate]. The similar rule in MDG is pSR-9 which subcategorizes the [-comitative] prepositions into [±circ] only, and not [±intm] in addition.

In other words, MDG has lost the [±intimate] distinction
for the [-comitative] prepositions. However, according
to MDG pSR-10, MDG has extended the feature [±source] in
order to account for the [+sorc, +comt] preposition.

The discussion of the rules so far can be applied to
the similarities and differences between the lexical items
themselves. On the [-reln, -surf] branch, the two languages
have [-assn, -sorc] and [-assn, +sorc] prepositions:
CG eis 'to' and apo 'from'; MDG se 'to, in, at' and apo
'from'. However, MDG has added the feature [-prol] to
each feature matrix in order to include the additional
[-assn] prepositions in MDG. The three new prepositions
and their feature matrices are as follows:

ja 'for'   pros 'towards'   mexri 'up to'

$$\begin{bmatrix} +P \\ -reln \\ -surf \\ -assn \\ +prol \\ -term \\ -path \end{bmatrix} \quad \begin{bmatrix} +P \\ -reln \\ -surf \\ -assn \\ +prol \\ -term \\ +path \end{bmatrix} \quad \begin{bmatrix} +P \\ -reln \\ -surf \\ -assn \\ +prol \\ +term \end{bmatrix}$$

On the [+assn] side of the[-reln, -surf] portion of the
tree, MDG and CG both have the distinction of [±comt] for
the prepositions. However, MDG has lost the [±intimate]
distinction for the [-comt] feature. The CG [+assn,
-comt, -circ] prepositions, pros and para 'by, near',
which are distinguished from each other by the feature
[±intimate], correspond to the MDG preposition konta
'near'. The CG [+assn, -comt, +circ] prepositions amphi

and peri 'around' are replaced by the MDG preposition giro 'around'. (CG pSR-6 and MDG pSR-9) MDG has added the [+sorc, +comt, +assn] preposition to its inventory, thereby necessitating the feature [±source] in order to distinguish the [+source] preposition, xori 'without' from the [-source] prepositions mazi and me 'with' (synonymous).

On the [-reln, +surf] branch, MDG has replaced the CG distinction of [±sorc] with [±side]. The CG preposition en 'in' has been replaced by MDG se 'in, at, to' and mesa 'inside'. The CG preposition ek 'from inside' is replaced by the MDG sequential preposition apo mesa apo 'from outside' (see Figure 21).

The [+reln, -vert] branch differs in the two languages with the addition of the feature [±proximate] in MDG. This feature is added to distinguish the MDG [-prox] preposition piso 'behind' from the [+prox] prepositions, brosta 'in front of' and apenanti/antikri 'opposite'.

In MDG the [±surface] feature is no longer needed on the [+reln, +vert] branch, since the prepositional features have been collapsed into one preposition. MDG epano replaces both CG ana 'up' and huper 'over'; MDG kato replaces both CG kata 'down' and hupo 'under'.

4.3 Modern Demotic Greek case inflection system

The changes in the case system with respect to the
localistic categories they represent were discussed in
Section 3.5. In this section the cases and the categories
they represent in Standard Modern Demotic Greek will be
presented.

From a five-case system in CG, which includes the
nominative, vocative, accusative, genitive, and dative
cases, MDG is represented by a four-case system which
includes all of the aforementioned cases except the dative.
The vocative case (the case of address) is rarely used in
MDG, and when it is, it coincides with the accusative
everywhere except the o-stems.

The dative case inflection no longer exists as a
separate category, due to regular phonological changes in
the system resulting in competing morphological forms, with
the eventual loss of the dative label as a separate
category. The semantic functions of the dative case
inflection have been absorbed by either the genitive case
or prepositions combined with the accusative case.

The few idiomatic dative expressions that have come
down to MDG from Classical Greek via New Testament Greek
were listed in Section 3.5.2.

Section 4.3.1 discusses the semantic feature represen-
tations of the MDG case; Section 4.3.2 sets up a case tree

based on the semantic features; and Section 4.3.3 presents the rules for the MDG case system.

4.3.1 Case inflections

NOMINATIVE: The nominative case continues to represent the grammatical subject, as in CG. In CG it was considered to be a non-local case, as it still is in MDG.

VOCATIVE: As in CG, the vocative case is a non-local case of address.

GENITIVE: The genitive case is a non-local, adnominal case. It is used primarily to express an attributive relationship with another noun. An example of this usage was presented in sentences (3.7) and (3.9). Another example from a modern Greek novel follows:

(4.4) <u>i   θimises   tis   imeras</u>   (Kaliotsu:63)
```
       the      remembrances the   day
       +NM      +NM          +gen  +gen
```

     'the remembrances of the day'

The [-adnominal] genitive can still be found in its former [+sorc] usage in the written language when an author uses a stylistic slant, as in a novel by Vasilikù, in which he quotes from the daily newspaper, reverting to Katharevousa, or 'puristic Greek':

(4.5) ...ek <u>Londinu</u>...   (Vasiliku:30)
```
       from London
       +P   +N
            +gen
```

     'from London'

All literate Greeks would immediately understand this phrase, despite both the absence of this reposition and the lack of this construction in MDG. This is because of formal schooling, which includes the classical language for all Greeks.

Some dialects also use the genitive to express the 'experiencer' as in sentence (3.2), repeated here as sentence (4.6). This illustrates a dialectal formation of the 'experiencer'. (In the standard language 'experiencer' is expressed by a preposition and the accusative case, as in sentence (3.1).)

(4.6)	Edosa	tis	mikris	to	grama
	+V	+Det	+N	+Det	+N
	gave	+gen	+gen	+acc	+acc
	(1 sg)	the	girl	the	letter

'I gave the girl the letter'. or 'I gave the letter to the girl'.

The genitive plural appears unusually infrequently in comparison with all other case and number combinations. Very often an accusative plural is substituted in all dialects. For example in the following pair of sentences, the first, (4.7), has the attributive noun in the expected genitive plural. The second sentence (4.8) is identical semantically but employs the more frequent accusative plural:

```
(4.7) girevo    ta      foramata    ton     ginekon
      +V        +Det    +N          +Det    +N
      look for  +acc    +acc        +gen    +gen————————
      (1 sg)    +pl     +pl         +pl     +pl         |
                the     dresses     the     women       |
                                                        |
      'I am looking for the women's dresses'.           |
                                                        |
(4.8) girevo    ta      foramata    tis     ginekes     |
                                    +acc    +acc ←——————|
```

ACCUSATIVE: The accusative expresses all other
semantic categories other than the possessive [+adnominal]
relationship between nouns. For this reason it is labeled
as the [-adnominal] case in this analysis. The accusative
case can be found with or without an accompanying preposi-
tion. When the accusative represents the direct object
of the verb, there is no preposition, as with to grama in
sentence (4.6) and ta foramata in sentences (4.7) and
(4.8). The categories that are represented by a preposi-
tion and a nominal marked for the accusative are:
partitive, agent of passive (although rarely used in MDG),
separation, source, cause, and goal. All prepositions,
including source, goal, and locative prepositions are found
with the accusative of a noun. Sentence (4.9) illustrates
a combination of a [+source] preposition (apo 'from') with
a nominal in the accusative case inflection:

(4.9)

to	arpazi	ap'	to	stoma	(Vasiliku:20)
+N	+V	⌈+P⌉	+Det	+N	
+pron	grab	│+sorc│	+acc	+acc	
+acc	(3 sg)	│-prol│	the	mouth	
it		│-assn│			
		│-surf│			
		⌊-reln⌋			
		from			

'He grabs it from the mouth'.

4.3.2 Case inflection tree

The MDG case tree is unlike that of CG in that the oblique cases do not share a one-to-one correspondence with the local feature analysis. The genitive case is no longer interpretable as [+source], as shown by its occasional [+goal] use in sentences such as (4.6); it is used almost solely as an attributive form and is therefore labeled [+adnominal]. The remaining [-adnominal] oblique case is the accusative case. It is the case that is found with all prepositions and serves to mark the direct object of the verb.

With this division of features, the MDG case tree needs to make only a [±adnominal] distinction in the [-nominative] branch. The following tree illustrates the [±adnominal] distinction for MDG nominals:

```
                    +N
                    |
                    ±pl
              _____|_____
             /             \
           -NM             +NM
         ___|___            |
        /       \           |
    -adnom    +adnom        |
       |         |          |
      Acc       Gen        Nom
```
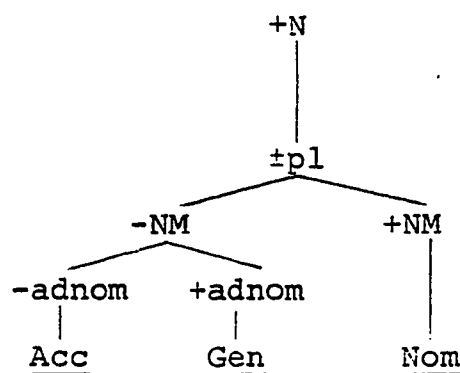
Figure 19.   Basic Modern Demotic Greek case inflection tree.

The following case feature tree is the MDG counterpart
of the CG tree in Figure 7.   The masculine noun potamos
'river' is presented here in a horizontal paradigm.


```
                              +N
                    _____|_____
                   /                     \
                 -pl                     +pl
            _____|_____           _____|_____
           /             \         /             \
         -NM            +NM      -NM            +NM
       ___|___           |     ___|___           |
      /       \          |    /       \          |
  -adnom   +adnom        | -adnom  +adnom        |
     |        |          |    |        |         |
  potamo   potamu    potamos potamus potamon  potami
```
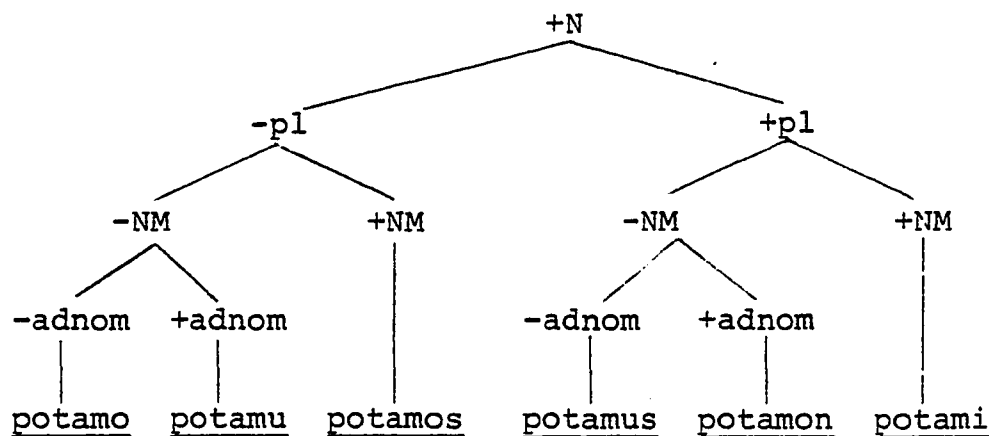
Figure 20.   Modern Demotic Greek case inflection tree with
             noun.

4.3.3 Case inflection rules

Only two inflectional case subcategorization rules
are needed to describe the MDG case inflection system:

    cSR-1   [+N] → ⎡±pl⎤
                    ⎣±NM⎦

    cSR-2   [-NM] → [±adnom]

The following case label rules, which are outside the grammar, serve as labels for the nominal system in MDG. These are the terminal nodes of the case tree in Section 4.3.2:

clRR-1 [+NM]   → [+nom]

clRR-2 [-adnom] → [+acc]

clRR-3 [+adnom] → [+gen]

The MDG case rules are quite different from the CG case rules. The MDG rules no longer make reference to local semantic features. In CG only the nominative case inflection was non-local; in MDG the entire case system is non-local.

The dative case, which was the case of location or [-direction], no longer exists in MDG. The genitive case, which in CG was the case of [+source], in MDG is the attributive case and is given the feature [+adnominal]. The accusative case, which in CG represented the case of 'motion to', in MDG represents all categories except for grammatical subject (a function of the nominative case) and [+adnominal] relationships (a function of the genitive case), and is given the feature [-adnominal].

The rules for the case systems of the two languages are presented here again for comparison:

```
CG cSR's                          MDG cSR's

-1  [+N]  →  ⌈±pl⌉        -1  [+N]  →  ⌈±pl⌉
             ⌊±NM⌋                     ⌊±NM⌋

-2  [-NM] →  [±drcn]      -2  [-NM] →  [±adnom]

-3  [-drcn] → [±sorc]
```

4.4 Modern Demotic Greek combined preposition and case inflection system

The MDG combined system of prepositions and case inflections constitutes the prepositional portion of the MDG case-marking system. The remaining portion is the combined inflectional system that will be presented in the final section of this chapter, Section 4.7, the case-marking system of MDG.

The combined preposition and case system consists of simple and sequential prepositions (see Section 4.2 and the following sections) and one case inflection, the accusative case, labeled [-adnominal] in the lexicase framework. All nominals are inflected in the accusative case when preceded by a preposition. The MDG system differs from the preposition and case system of CG, since in CG the case following the preposition can be in one of three oblique cases.

Section 4.4.1 discusses the possible combinations of prepositions and case inflections; Section 4.4.2 presents a computer print-out of the combination case inflection and preposition tree; and Section 4.4.3 presents the combination rules.

4.4.1 Combined prepositions and case inflection

The combined system of case inflection and preposi-
tions consists of all the prepositions (simple and sequen-
tial) followed by a nominal inflected in the accusative
case.

This section discusses the syntactic and morphologi-
cal differences between the two types of prepositions.
All the prepositions are then placed in Table 11,
which is   similar to Table 4 for CG, based on their
local feature distinctions.

The simple prepositions of MDG are as follows:

me 'with'
xoris 'without'
apo 'from'
mexri 'up to' (also with a following se)
pros 'towards'
se 'to, at, in'
ja 'for'

Se has the peculiar property of being a 'fused' form
when followed by the definite article. This is called
;crasis' (Householder et al., 1964:12) and is represented
by the following morphophonemic rule: (mIRR'-11)

se   →   s- /_ definite article that begins with t-

The syntactic subsystem of the sequential prepositions
is composed of the adverbial prepositions as discussed in
Section 3.6.1. Sequential prepositions can be defined as
a sequence of two adjacent prepositions in a complex PP.
These sequential prepositions can be grouped according to

the 'secondary' prepositions with which they are found,
just as prepositions in CG can be grouped in terms of
following case inflections. The secondary prepositions are
drawn from the list of simple prepositions. Sequential
prepositions can be followed by one of three simple
prepositions: se, apo, or me. Ja as a secondary preposi-
tion is found only in antis ja 'instead of'; this is an
extremely uncommon combination (cf. anti in Section 3.6.1).
Sequential prepositions never appear without a secondary
preposition (except for mexri and mexri se, which appear in
free variation) in MDG.

De-adverbial prepositions are derived via the analogical
derivational rule (ADR) mentioned in Section 4.2, repeated
here:

ADR-1 $\begin{bmatrix} +Adv \\ -manner \end{bmatrix}$ >→ [+P]

e.g. ekso   >→ ekso
      [+Adv]   [+P]

A set of redundancy rules is needed to block illegal
combinations of prepositions in the 'sequential' form. For
example, ekso only occurs with apo (ekso apo 'outside'),
therefore a RR is set up to block occurrences of *ekso se.

The de-adverbial prepositions can be classified into
three groups, according to the secondary preposition with
which they co-occur, just as CG prepositions can be grouped
in terms of the following case inflection.

prepositions with <u>se</u> (or fused form <u>s</u>-):

    konta se 'near'
    mesa se 'inside'
    giro se 'around'
    brosta se 'in front of, before'
    apenanti se 'opposite'
    antikri se 'opposite'
    epano se 'on, on top of, up'
    kato se 'down'
    piso se 'behind'
    mexri (se) 'up to'

prepositions with <u>apo</u>:

    ekso apo 'outside of'
    epano apo 'over, above'
    kato apo 'under, below'
    apo konta apo 'from near (by)'
    apo giro apo 'from around'
    apo 'pano apo 'from on top of, from above'
    apo mesa apo 'from inside'
    apo ekso apo 'from outside'
    apo piso apo 'from behind'
    apo brosta apo 'from in front of'
    apo apenanti apo 'from opposite'
    apo antikri apo 'from opposite'
    apo kato apo 'from (down) below, from under(neath)'

preposition with <u>me</u>:

    mazi me 'with'

Based on the following Phrase Structure Rules, the simple prepositions can be distinguished diagrammatically from the sequential prepositions:

Prepositional Phrase Structure Rule

$$PP \rightarrow P \left\{ \begin{array}{c} NP \\ S \\ PP \end{array} \right\}$$

Simple preposition: (<u>apo</u> 'from') (this is a repetition of sentence (4.9))

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(4.10) to   arpazi   ap'   to   stoma   (Vasiliku:20)
        +N   +V   +P   +Det +N
        +pron   +sorc +acc +acc
        +acc
        it   grab   from   the   mouth
                (3 sg)

'He grabs it from the mouth.'

```
                    S
         _____|_____
        NP          V           PP
        |                    ___/|___
        N                   P        NP
                                     |
                                Det   N
                                 |    |
        to  arpazi   apo        to   stoma
```
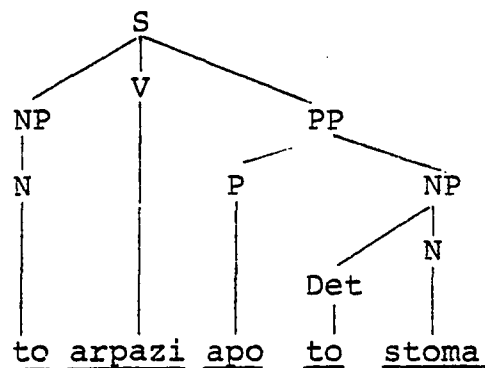
(4.11) vgazun   ta   skupidia   tus   ekso ap' tis
       +V   +Det   +N   +N   +P   +P   +Det
       take out +acc   +acc   +pron   ‿‿‿   +acc
       (3 pl)   the   garbage   their   outside   the

       portes   tus   (Vasiliku:22)
       +N   +N
       +acc   +pron
       doors   +gen
                 their

'They take their garbage outside of their doors.'

```
        S
    ____|_____
    V              NP              PP
    |          ___/|___        ___/|___
    |        Det   N   NP      P        PP
    |         |    |   |               _/|_
    |         |    |   N              P    NP
    |         |    |   |              |   _/|_
    |         |    |   |              |  Det N  NP
    |         |    |   |              |   |  |  |
    |         |    |   |              |   |  |  N
  vgazun     ta skupidia tus       ekso apo tis portes tus
```
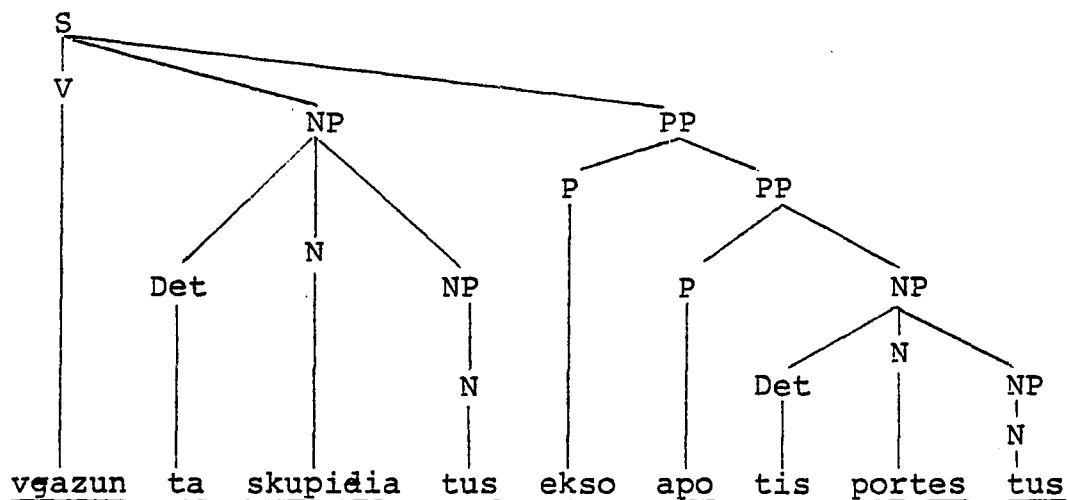
The sequential prepositions such as <u>ekso apo</u> pattern syntactically in a fashion similar to that of the English 'complex' prepositions such as 'out of' or 'together with'.

The chart in Table 11 presents the MDG case-marking prepositions. This chart is similar to Table 4, which shows the prepositions and local features in CG. The main difference is the absence of case labels following the prepositions in MDG. In the MDG case-marking system, all prepositions are followed by a nominal inflected in the accusative case, so case does not contribute to the meaning of a PP. Table 11 illustrates the MDG case-marking prepositions arranged according to the local distinctions location, goal, and source.

The majority of de-adverbial prepositions are followed by the secondary preposition <u>se</u>, and are unmarked for location or goal in the lexicon. For example, since <u>mesa se</u> is not marked for either of these two features on the combined preposition tree in Figure 21, these features are compatible. The difference in interpretation between goal and location comes from the features on the verbs, as illustrated in the following two sentences:

Table 11.

Modern Demotic Greek Prepositions and Local Features

gloss	location	goal	source/separation*
by, near	konta	se	apo konta apo
around	giro	se	apo giro apo
with	me mazi me		
without			xoris*
on,on top of	epano	se	apo 'pano apo
inside	mesa	se	apo mesa apo
at, in, to		se	
outside	ekso	apo	ap' ekso apo
from			apo
to		mexri (se) ja pros	
behind	piso	se	apo piso apo
before	brosta	se	apo brosta apo
opposite	apenanti se antikri se		apo apenanti apo apo antikri apo
up over,above	epano se epano apo		apo 'pano apo apo 'pano apo
down under,below	kato se kato apo		apo kato apo apo kato apo

*xoris is best defined by 'separation', in the sense of 'apart from'.

2ll

(4.12) <u>ime</u>   <u>mesa</u>   <u>sto</u>   <u>sxolio</u>
                mesa   se to
      +V   +P   +P   +N
      -drcn   +Det +acc
      am   ┌─reln┐   +acc school
       (1 sg)   │+surf│   the
                │+side│
                │+nter│
                └─sorc┘

'I am in the school.'

(4.13) <u>pigeno</u> <u>mesa</u>   <u>sto</u>   <u>sxolio</u>
                mesa   se to
      +V   +P   +P   +N
      +drcn   +Det +acc
      +goal   ┌─reln┐   +acc school ·
      go   │+surf│   the
       (1 sg)   │+side│
                │+nter│
                └─sorc┘

'I am going inside the school.'

(mIRR'-11:   se→s /_ #t, when #t is a determiner)
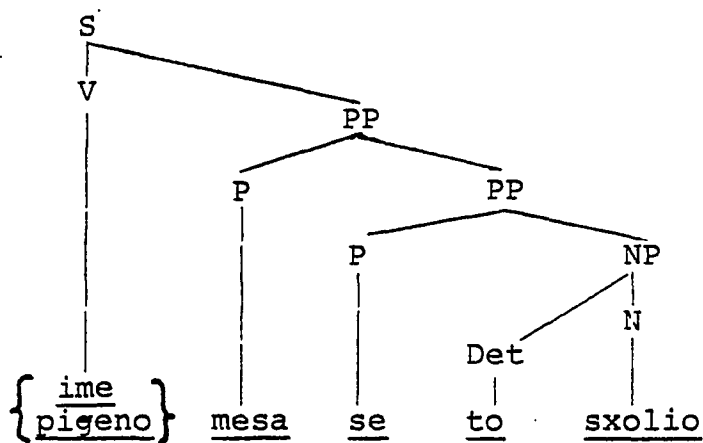
This duality of function is probably derived from the
confusion of similar CG forms: <u>eis</u> 'to' and <u>en</u> 'in'. CG
<u>eis</u> derives from *<u>ens</u>, while <u>en</u> derives from *<u>en+s</u>.
Jannaris states that during the period 300 B.C. to A.D.
600 (Hellenistic and early Byzantine periods), there was
"an ever increasing confusion and interchange of <u>eis</u> and

en, until ultimately *eis*, owing to the popularity of its final sound *-s* as well as to its convenient construction (accusative), displaced and obliterated *en* " (1968:377). The MDG preposition can, depending on the verb, be translated as either locative or goal, as illustrated in the following two sentences:

(4.14) (repeat of (3.3)) *se* as locative:

meno	stin		aθina		S
	se tin				
+V	+P	+Det	+N		
-drcn	in	+acc	+acc		
live					
(1 sg)					

'I live in Athens.'

```
S
|\
V   \
|    PP
|   /  \
|  P    NP
|  |   /  \
|  | Det   N
|  |  |    |
meno se  tin aθina
```

(mIRR'-11: se→s-/_ Det #t)

(4.15) *se* as goal:

pigeno	sto		sxolio		S
	se to				
+V	+P	+Det	+N		
+drcn	to	+acc	+acc		
+goal		the	school		
go					
(1 sg)					

'I go to school.'

```
S
|\
V   \
|    PP
|   /  \
|  P    NP
|  |   /  \
|  | Det   N
|  |  |    |
pigeno se to sxolio
```

(mIRR'-11: se→s-/_ Det #t)
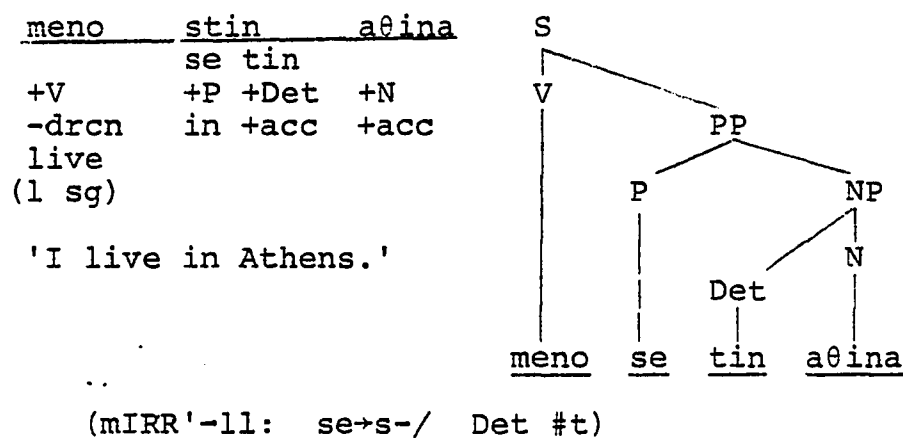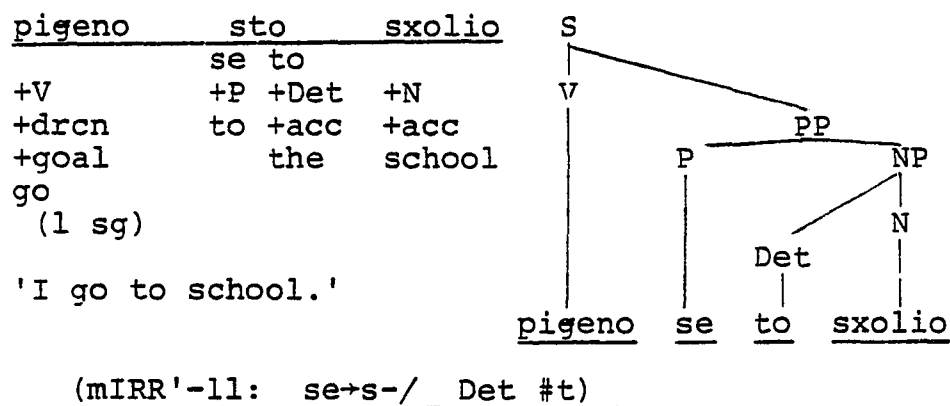
The third local distinction, source (the column on the right in Table 11), is realized by sequential prepositions with the secondary preposition *apo* on both sides. There are only two simple [+source] prepositions: *apo* 'from' and *xoris* 'without'.

Based on the following Prepositional Phrase Structure

Rule:

$$PP \rightarrow P \begin{Bmatrix} NP \\ S \\ PP \end{Bmatrix}$$

PP →P⌢PP applies twice, followed by:

$$PP \rightarrow P⌢NP$$

An example of the [+source] sequential preposition is

<u>apo mesa apo</u> 'from inside'.

(4.16)

<u>efiga</u>	apo	mesa	apo	to	spiti
+V	+P	+P	+P	+Det	+N
left				+acc	+acc
(1 sg)		(from)inside		the	house

'I left the house.'

```
            S
            |
    _____|_____
    V                PP
    |            ____|____
    |            P        PP
    |            |    _____|_____
    |            |    P         PP
    |            |    |     _____|_____
    |            |    |     P        NP
    |            |    |     |        |
    |            |    |     |        N
    |            |    |    Det       |
    |            |    |     |        |
  efiga        apo  mesa   apo   to  spiti
```
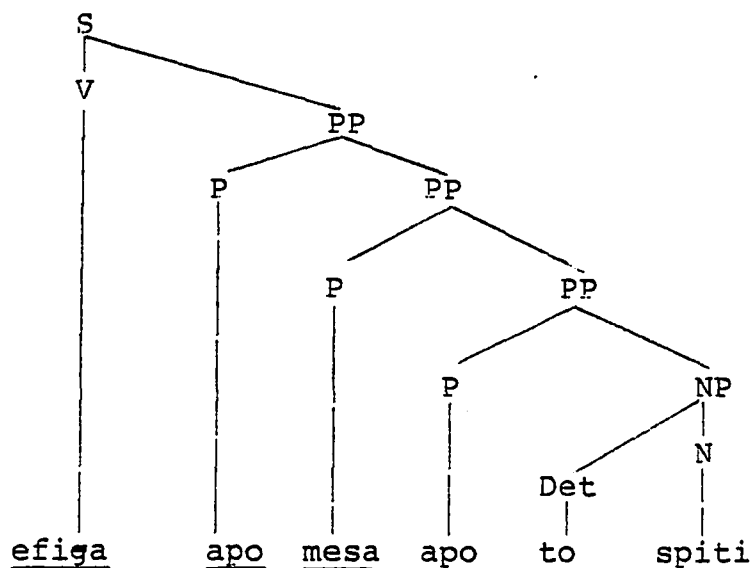
4.4.2 Combined preposition and case inflection tree

The computer print-out in Figure 21 is the combined
case-marking preposition tree in MDG. This is a combina-
tion of the [-adnominal] nominals and all the preposition
combinations in the system. Figure 21 is based on the

+N +P -NM -ADNOM SING/PL

///CSR-1///

///CSR-2///

ACCUSATIVE

-SORC
-RELN

-SURF

-ASSN

+PROL   +ASSN   +SURF   -SORC
                                                                                     +RELN

-PROL   -TERM   -COMT   +SIDE   -VERT

                    +TERM   +COMT   +PROX

///PSR-5/// -PATH +PATH   -CIRC +CIRC   -SIDE -NTER +NTER   -PROX -INTM   +INTM

                    MEXRI-SE   MAZI-ME   APENANTI-SE

SE   JA   PROS   MLXRI KONTA-SE GIRO-SE   ME EPANO-SE EKSO-APO MESA-SE PISO-APO BROSTA-SE ANTIKRI-SE

Figure 21. Modern Demotic Greek combined case inflection and
preposition tree.

Figure 21. Concluded.

distinctions set up on the preposition and local categories in Table 11.

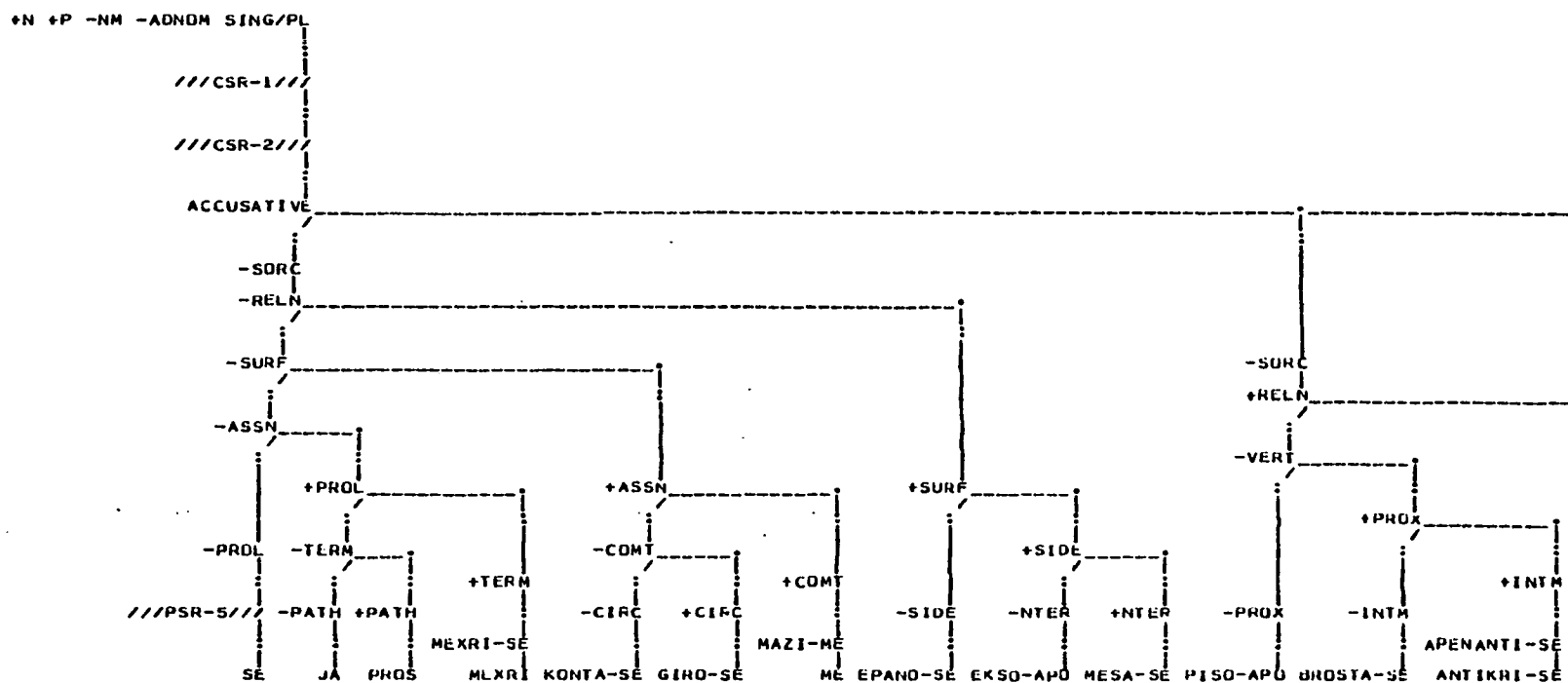The MDG combination tree differs in two major ways from the CG combination tree (Figure 8):

1. In MDG there is only one co-occurring case, the accusative [-adnom], whereas in CG there were three possible case inflections co-occurring with the prepositions.

2. In MDG the major local branching is [±source], the major division between the combined prepositions: [-source] prepositions vs. [+source] prepositions (see Table 11). Whereas, in CG, the local divisions were [±direction] and [±source], distinctions deriving from the co-occurring case inflections.

4.4.3 Combined preposition and case inflection rules

The combined preposition and case subcategorization rules reflect the divisions of the combined case and preposition system. These rules are quite similar to those of Section 4.2.3. The change is the movement of the feature [±sorc] from pSR's-5 and 10 to a higher node in the tree; to cpSR-1. This modification results in a simplification of the set of rules describing the case marking system of MDG. The redundancy rules are added to block illegal combinations.

MDG combination case inflection and prepositional subcate-
gorization rules:

cpSR-1 $\begin{bmatrix} +N \\ -adnom \\ +P \end{bmatrix}$ → $\begin{bmatrix} \pm sorc \\ \pm reln \end{bmatrix}$

cpSR-2 [-reln] → [±surf]

cpSR-3 [-surf] → [±assn]

cpSR-4 [-assn] → [±prol]

cpSR-5 [+prol] → [±term]

cpSR-6 [-term] → [±path]

cpSR-7 [+assn] → [±comt]

cpSR-8 [-comt] → [±circ]

cpSR-9 [+surf] → [±side]

cpSR-10 [+side] → [±nter]

cpSR-11 [+reln] → [±vert]

cpSR-12 [-vert] → [±prox]

cpSR-13 [+prox] → [±intm]

cpSR-14 [+vert] → $\begin{bmatrix} \pm surf \\ \pm nter \end{bmatrix}$

cpRR-1 [+prox] → [+goal]

cpRR-2 $\begin{bmatrix} +surf \\ -side \end{bmatrix}$ → [-sorc]

4.5 Modern Demotic Greek declensional system

There are three declensions in MDG, as in CG. The MDG declensional system has traditionally been classified according to gender, as discussed in Section 3.5. Within the genders are the classes of nouns according to the stem vowel.

Section 4.5.1 discusses the declensions and classes; Section 4.5.2 presents two trees: one with the three-way gender distinction, and a second with the stem vowel subclass incorporated into the genders; and Section 4.5.3 presents the declensional rules and contrasts them with those of CG.

4.5.1 Declensions

The major change in the declension system from CG to MDG has been the loss of the consonant stem inflections, the historic third declension. The shift of the nominals from the CG third declension to the first and second declensions gave rise to the gender classification system of MDG:

declension	gender
1	masculine (ms)
2	feminine (fm)
3	neuter (nt)

The main difference between the CG and MDG declensional systems is the primary classification: the CG nominals are classified first with reference to a thematic stem, the MDG substantives with reference to gender. Thereafter, the secondary classifications are similar: the final segment

of the stem. The final segment is always a vowel in MDG since the non-thematics, which were primarily consonant final stems, no longer exist as a classification. The high-frequency classes of MDG are: masculine and neuter stems that end in -a, -o, and -i, and feminines that end in -a or -i only.

4.5.2 Declension tree

The MDG declensional tree is first set up according to gender distinctions of neuter vs. non-neuter nouns and the masculines vs. feminines within the category of non-neuters. The terminal nodes of this basic tree are numerical classificatory labels of declensions.

```
                        +N
                        |
                       ±pl
              -nt              +nt
        -ms         +ms          |
         |           |           |
        +fm          |           |
         |           |           |
      2 decl      1 decl      3 decl
```
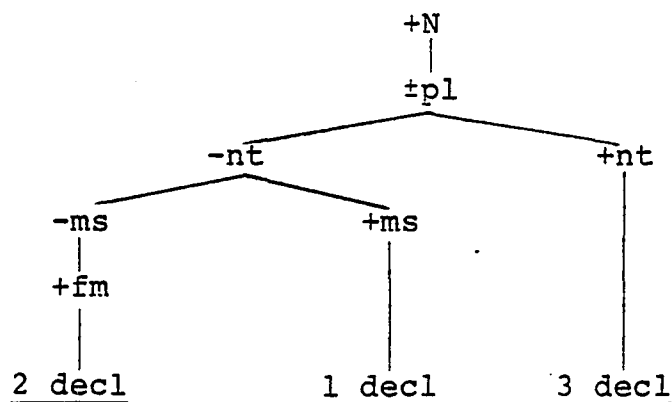
Figure 22. Basic Modern Demotic Greek declension tree.

The possible stems within each gender classification must be added to this primary classification tree. There are three stem vowels that are found in MDG: -a, -o, and -i. All three are found in all three genders except for -o among the feminines. (Some dialects retain the CG II

declension -os feminines, but generally they are trans-
ferred to the 3 declension neuters as o-stems.)

```
                          +N
                          |
                         ±NM
                          |
                         ±pl
              -nt                        +nt
         -ms       +ms              -o          +o
       -a   +a   -o     +o        -a    +a          |
              -a  +a
       -i   -a  -i  -a   -o        -i   -a          -o
```
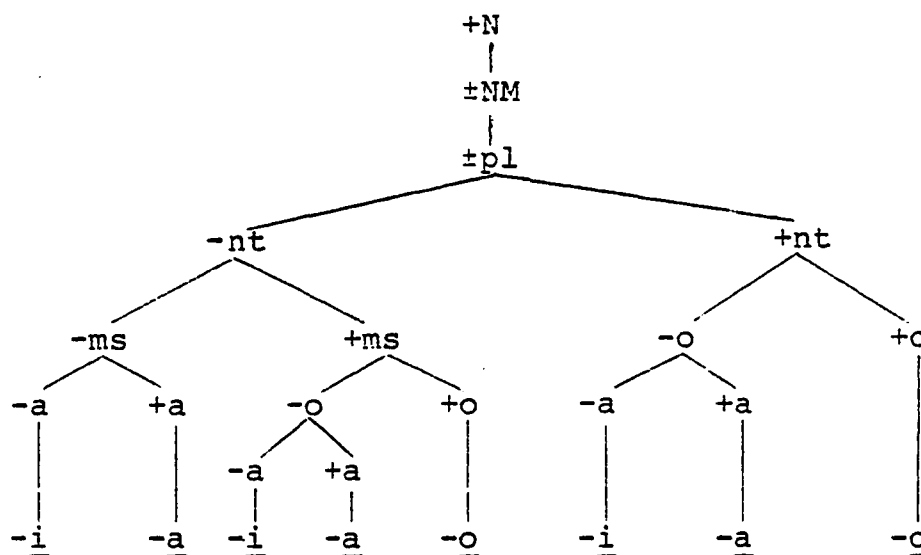
Figure 23.   Modern Demotic Greek declension tree with
             subclasses.

4.5.3 Declension rules

In MDG as in CG there are two types of rules in the
declensional system: lexical Redundancy Rules, those which
state the predictable features of the declensions, and
inflectional Subcategorization Rules, which characterize
the subcategories within the declensional system.   These
rules have been combined with the case Subcategorization
Rules and the inflectional marking Redundancy Rules and
their validity tested by computer.   A computer print-out
of all these rules can be found in Appendix I.

The declensional rules are as follows:

dSR-1   [+N]   → $\begin{bmatrix} \pm pl \\ \pm nt \end{bmatrix}^2$

dSR-2   [-nt]   →   [±ms]

dSR-3 $\left\{ \begin{array}{c} [+nt] \\ {} \\ [+ms] \end{array} \right\}$ →   [±o]

dSR-4 $\left\{ \begin{array}{c} [-ms] \\ {} \\ [-o] \end{array} \right\}$ →   [±a]

RR-1   [-ms]   →   [+fm]

RR-2   [-a]   →   [+i]

The major categories of the nominal system are number and gender; all nouns are plural or non-plural (singular) and neuter or non-neuter according to the first declensional subcategorization rule. Note that the division [±pl] is also present in the case subcategorization rules. The number distinction is basic for both systems and is therefore mentioned in both sets of rules. The number and gender distinction is also part of CG dSR-1, with the additional division of thematic and non-thematic stems.

The second subcategorization rule divides all non-neuters into masculines or non-masculines. RR-1 states ·that non-masculines are feminines.

dSR-3 subcategorizes all neuters and all masculines into o-stems or non-o-stems. The next rule subcategorizes all non-masculines (feminine, according to RR-1) and all

non-o-stems into a-stems or non-a-stems. RR-2 states that
non-a-stems arɪ i-stem nominals.

The changes of the rules from CG to MDG were discussed
in Section 3.4, changes in the declensional system.

4.6 Modern Demotic Greek nominal inflectional system

The inflectional system is based on the stem vowel of
the nominal. The suffixes of the various cases are added
to the stem, as in CG.

Section 4.6.1 presents two charts containing the
inflectional affixes of MDG; the inflectional system in
tree form is found in Section 4.6.2; and the rules for the
inflectional system are presented in Section 4.6.3, along
with a comparison of the CG inflectional rules. Only the
high-frequency inflections and paradigms are presented
here.

4.6.1 Nominal inflectional affixes

The inflections are laid out in two tables on the
following page. The tables are identical with regard to
the inflections charted. The difference is in the style
of presentation. Table 12 breaks down all the classes of
the declensions and states the inflections for each
individual class within the declensions. Table 13 pre-
sents the possible suffixes for each case inflection and
number, without reference to declension or class. Table 13

Table 12.

Modern Demotic Greek nominal inflectional suffixes
(individual classes)

			SINGULAR			PLURAL		
			NOM	ACC	GEN	NOM	ACC	GEN
decl	gender	stem						
1	ms							
		a	s	∅	∅	-es	-es	-on
		i	s	∅	∅	-es	-es	-on
		o	s	∅	u	-i	-us	-on
2	fm							
		a	∅	∅	s	-es	-es	-on
		i	∅	∅	s	-es	-es	-on
3	nt							
		o	∅	∅	u	a	a	-on
		i	∅	∅	u	a	a	on
		a	∅	∅	u	a	a	-on

Table 13.

Modern Demotic Greek nominal inflectional suffixes
(all classes)

CASE:	NM	ACC	GEN
FEATURE:	[+nominative]	[-adnom]	[+adnom]
NUMBER			
SG:	s/∅	∅	s/u/∅
Pl:	(-e)s/i/a	${-e \atop -u}$s/a	on

is presented for ease of reference and comparison to the
CG inflectional system.

A few morphophonemic conditions and notes on the
tables and the inflectional system are presented here:

1. The masculines are the only nominals which have a
suffix added in the nominative singular.

2. The accusative and nominative forms are identical in
the singular and plural for both the feminine and neuter
substantives; but only identical in the plural [-o-stems]
for the masculines. The genitive and accusative singular
forms are identical in the masculine [-o-stem class].

3. The plural of a-and i-stem masculine and feminine
nominatives is actually -es, the -e replacing the stem
vowel of these forms (mIRR'-4). The accusative plural of
the [+o-stem] masculines is -us (mIRR'-3).

4. The genitive plural suffix -on replaces the stem vowel
for all nominals except for i-stem neuters (mIRR'-9).

5. The stem vowel -o is deleted before the following
suffixes:

-u genitive singular o-stems   oʊ = /u/

-i masculine plural nominative o-stems   oɩ = /i/

-a neuter nominative and accusative plural o-stems

(mIRR'-1).

6. A -t- is inserted between the stem vowel -a and the
suffix for neuters in the genitive singular and all cases
in the plural (mIRR'-6). A hyphen before a suffix in

Table 12 indicates loss of the preceding stem
vowel.

The inflectional system laid out in Tables 12 and 13
can be seen in the following high frequency paradigms:

	(i-stems)	(a-stems)	(o-stems)

MASCULINES (1 declension)

		'the judge'		'the cashier'		'the man'
SG	N	o	kritis	o	·tamias	o	anθropos
	G	tu	kriti		tamia		anθropu
	A	ton	kriti ·		tamia		anθropos
PL	N	i	krites	i	tamies	i	anθropi
	G	ton·	kriton		tamion		anθropon
	A	tus	krites		tamies		anθropus

FEMININES (2 declension)

		'the victory'		'the land'	
SG	N	i	niki	i	xora
	G	tis	nikis		xoras
	A	tin	niki		xora
PL	N	i	nikes	i	xores
	G	ton	nikon		xoron
	A	tis	nikes		xores

NEUTERS (3 declension)

		'the child'		'the name'		'the gift'
SG	N	to	pedi	to	onoma	to	doro
	G	tu	pediu		onomatu		doru
	A	to	pedi		onoma		doro
PL	N	ta	pedia	ta	onomata	ta	dora
	G	ton	pedion		onomaton		doron
	A	ta	pedia		onomata		dora

4.6.2 Nominal inflection tree

Figure 24, the MDG inflection tree, is based on the
combination of the declensional tree in Figure 23 and the
inflectional charts in Tables 12 and 13. The tree first
distinguishes [±nominative] nominals. The [-nominative]
substantives are further divided into [+adnominal] (geni-
tive) and [-adnominal] (accusative) cases. The remaining
distinctions are common to all cases: [±plural], [±neuter],
[±masculine], etc.

4.6.3 Nominal inflection rules

The rules on page 227 produce the inflectional
suffixes of the nominal system of Modern Demotic Greek.
These rules are similar to the mIRR's of CG (see the
corresponding Section 2.6.3). The rules that follow the
suffixes are the combined nominal inflectional rules: the
nominal suffixes and the morphophonemic rules of the
language.

The nominal suffixes are the mIRR's; the combined
suffixes and the morphophonemics are mIRR''s. As with the
inflectional rules in CG, the zero inflectional morpheme
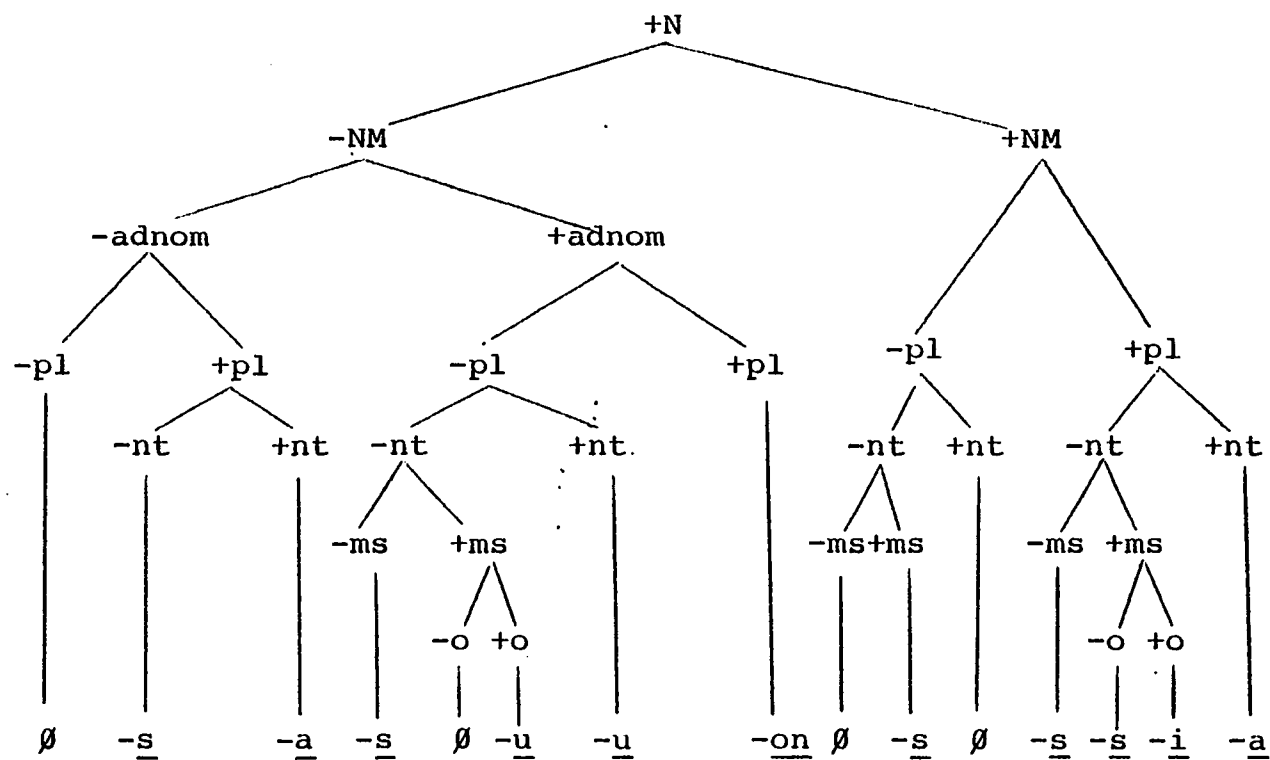need not be explicitly produced by a rule in the lexicase
model.

Figure 24. Modern Demotic Greek nominal inflection tree

MDG INFLECTIONAL MARKING REDUNDANCY RULES

mIRR-1

$$] \rightarrow i]\Big/ \begin{bmatrix} +NM \\ +pl \\ -nt \\ +o \end{bmatrix}.$$

mIRR-2

$$] \rightarrow s]\Big/ \left\{ \begin{bmatrix} +NM \\ -pl \\ +ms \end{bmatrix} \begin{bmatrix} +NM \\ +pl \\ -nt \\ -o \end{bmatrix} \begin{bmatrix} -adnom \\ +pl \\ -nt \end{bmatrix} \begin{bmatrix} +adnom \\ -pl \\ +fm \end{bmatrix} \begin{bmatrix} +NM \\ +pl \\ +fm \end{bmatrix} \right\}$$

mIRR-3

$$] \rightarrow u]\Big/ \left\{ \begin{bmatrix} +adnom \\ -pl \\ +ms \\ +o \end{bmatrix} \begin{bmatrix} +adnom \\ -pl \\ +nt \end{bmatrix} \right\}$$

mIRR-4

$$] \rightarrow a]\Big/ \left\{ \begin{bmatrix} +NM \\ +pl \\ +nt \end{bmatrix} \begin{bmatrix} -adnom \\ +pl \\ +nt \end{bmatrix} \right\}$$

mIRR-5

$$] \rightarrow on]\Big/ \begin{bmatrix} +adnom \\ +pl \end{bmatrix}$$

COMBINED MDG INFLECTIONAL MARKING REDUNDANCY RULES

		mIRR	corresponding to: morphophonemic statement
mIRR'-1	$\begin{bmatrix} +\text{adnom} \\ +\text{o} \end{bmatrix}$		5
	$\begin{bmatrix} -\text{adnom} \\ +\text{pl} \\ +\text{nt} \\ +\text{o} \end{bmatrix}$		5
o] →]/	$\begin{bmatrix} +\text{NM} \\ +\text{pl} \\ +\text{nt} \\ +\text{o} \end{bmatrix}$		5
mIRR'-2] → i]/	$\begin{bmatrix} +\text{NM} \\ +\text{pl} \\ -\text{nt} \\ +\text{o} \end{bmatrix}$	mIRR-1	
mIRR'-3 o] → u]/	$\begin{bmatrix} -\text{adnom} \\ +\text{pl} \\ +\text{ms} \\ +\text{o} \end{bmatrix}$		3
mIRR'-4	$\begin{bmatrix} -\text{adnom} \\ +\text{pl} \\ -\text{ms} \end{bmatrix}$		3
	$\begin{bmatrix} -\text{adnom} \\ +\text{pl} \\ -\text{nt} \\ -\text{o} \end{bmatrix}$		3
V] → e]/	$\begin{bmatrix} +\text{NM} \\ +\text{pl} \\ +\text{ms} \\ -\text{o} \end{bmatrix}$		3
	$\begin{bmatrix} +\text{NM} \\ +\text{pl} \\ +\text{fm} \end{bmatrix}$		3

	corresponding to:
mIRR	morphophonemic statement

mIRR'-5

$$
\text{]} \rightarrow \text{s]/} \left\{
\begin{array}{l}
\begin{bmatrix} +NM \\ -pl \\ +ms \end{bmatrix} \\[6pt]
\begin{bmatrix} +NM \\ +pl \\ -nt \\ -o \end{bmatrix} \\[6pt]
\begin{bmatrix} -adnom \\ +pl \\ -nt \end{bmatrix} \\[6pt]
\begin{bmatrix} +adnom \\ -pl \\ +fm \end{bmatrix} \\[6pt]
\begin{bmatrix} +NM \\ +pl \\ +fm \end{bmatrix}
\end{array}
\right.
$$

mIRR-2

"

"

"

"

mIRR'-6

$$
\text{]} \rightarrow \text{t]/} \left\{
\begin{array}{l}
\begin{bmatrix} +adnom \\ -pl \\ +nt \\ +a \end{bmatrix} \\[6pt]
\begin{bmatrix} +pl \\ +nt \\ +a \end{bmatrix}
\end{array}
\right.
$$

6

6

mIRR'-7

$$
\text{]} \rightarrow \text{u]/} \left\{
\begin{array}{l}
\begin{bmatrix} +adnom \\ -pl \\ +ms \\ +o \end{bmatrix} \\[6pt]
\begin{bmatrix} +adnom \\ -pl \\ +nt \end{bmatrix}
\end{array}
\right.
$$

mIRR-3

"

mIRR'-8

$$
\text{]} \rightarrow \text{a]/} \left\{
\begin{array}{l}
\begin{bmatrix} +NM \\ +pl \\ +nt \end{bmatrix} \\[6pt]
\begin{bmatrix} -adnom \\ +pl \\ +nt \end{bmatrix}
\end{array}
\right.
$$

mIRR-4

"

	corresponding to: mIRR	morphophonemic statement

mIRR'-9

$\{ \begin{smallmatrix} a \\ o \end{smallmatrix} \} \;] \; \rightarrow \; on] / \left\{ \begin{array}{c} \begin{bmatrix} +adnom \\ +pl \\ -nt \\ +i \end{bmatrix} \\ \begin{bmatrix} +adnom \\ +pl \\ +a \\ -nt \end{bmatrix} \end{array} \right\}$

	mIRR	statement
	mIRR-5	4
	mIRR-5	4

mIRR'-10

$] \; \rightarrow \; on] / \begin{bmatrix} +adnom \\ +pl \end{bmatrix}$ mIRR-5

mIEE'-11

$se \; \rightarrow \; s / \begin{bmatrix} +Det \\ +dental \\ -voice \end{bmatrix}$

The inflectional marking system of MDG is not unlike that of CG. In fact, of all the sets of rules that have been stated for the two languages, the inflectional rules are most similar to each other. Only three of the CG mIRR's no longer exist in MDG. And of those three rules, two of them applied to the dative plural system. The major loss from the inflectional system, aside from the entire dative case, is the loss of the -n suffix from the accusative singular and from one class of nominatives.

The following is a comparison of the combined morphophonemic rules of the two languages. The segment change is presented first, then the CG mIRR' number (prime system), followed by the corresponding MDG mIRR' (prime system)(or explanation when there is no corresponding rule in the Modern language):

segment change	CG rule	MDG rule	comment
s → ∅	mIRR'-1	none	no sigma stems in MDG
V → e	2	none	no sonorant stems in MDG
∅ → o	3	none	no non-thematics
a → ē	4	none	paradigm leveling by MDG
o → ō	5a	none	no dative in MDG
	5b	none	no sigma stems in MDG
∅ → i	6a	mIRR'-2	
	6b	none	no dative in MDG
o → ∅	7	mIRR'-1	
∅ → a	8a b c	mIRR'-8	
	d e f	none	no consonant or sigma stems
[+dent] → ∅	9	none	no consonant stems (also see Section 3.4.2.3)
∅ → si	10	none	no non-thematics
∅ → is	11	mIRR'-5c, -4a, and -4b	
∅ → n	12	none	ending is lost in MDG

segment change	CG rule	MDG rule	comment
{$_o^a$}→ ou	mIRR'-13	mIRR'-7 and -3	
$\emptyset$ → e	14	mIRR'-4	
$\emptyset$ → s	15	mIRR'-5	some matrices lost: non-thematics
{$_o^a$}→ ōn	16	mIRR'-9	
$\emptyset$ → ōn	17	mIRR'-10	
Vs → V̄	18	none	no consonant stems
Va → ē	19	none	no sonorant stems
Vo → ou	20	none	no sigma stems

NO CORRESPONDING RULE:

MDG mIRR'-6:   -t- was part of the stem in CG

4.7 Summary of the case-marking system of Modern Demotic Greek

The MDG case-marking system consists of three case inflections and combinations of prepositions followed by NP's in the accusative case. This system is represented in the computer print-out trees: Figure 21, the combined prepositions and case inflection portion, and Figure 25, the combined nominal inflectional portion of the case-marking system. The tree in Figure 25 is composed of the case subcategorization rules, the declensional subcategorization rules and redundancy rules, and the inflectional redundancy rules, including the morphophonemic rules.
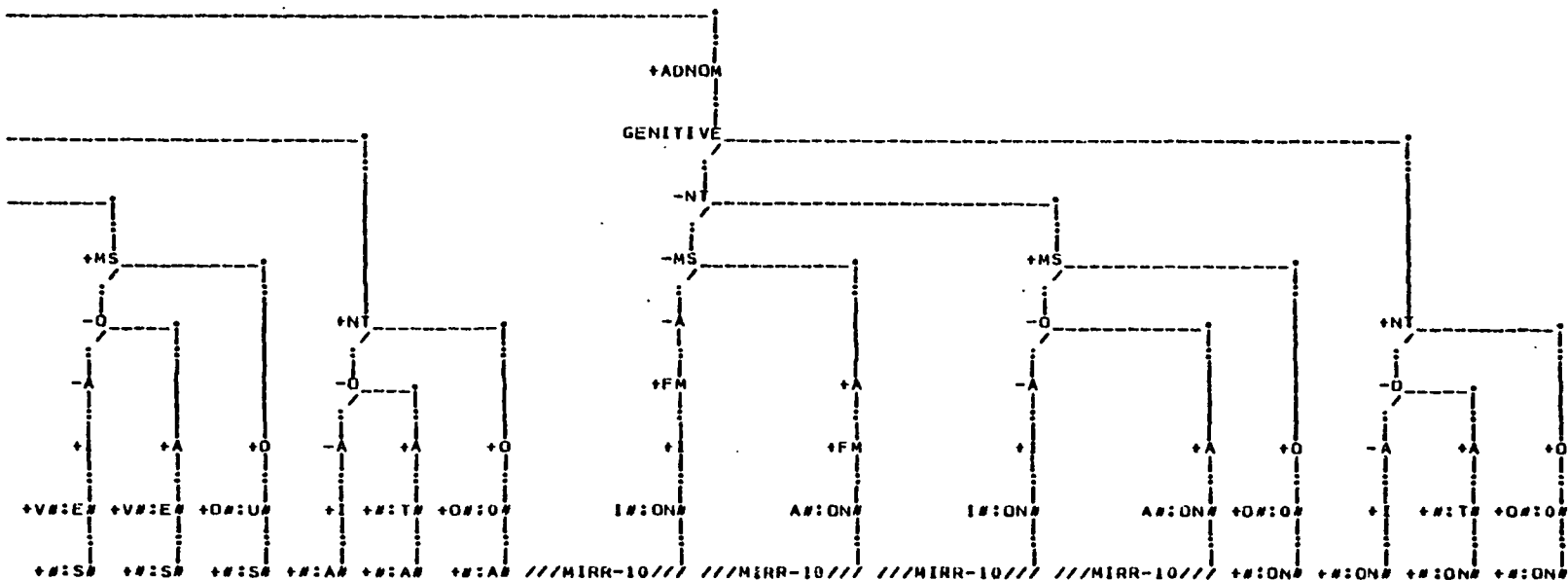
Figure 25. Modern Demotic Greek combined nominal inflection tree.

Figure 25. Continued.

Figure 25. Concluded.

Footnotes to Chapter 4

[1]My knowledge of Greek consists of having been brought up in a bilingual Greek-English home (of parents born in Turkey), educated in a private Greek-American elementary school in New York City, living in Greece as a child and as an adult, and attending a year of an English-Greek high school in the suburbs of Athens.

[2]An initial division into [±pl, ±fm] in lieu of [±pl, ±nt] would simplify the declensional subcategorization rules, but complicate the redundancy rules.

CHAPTER 5

Summary and Conclusion

5.1 Summary

This chapter is a brief summary of the research undertaken in this study. The localist hypothesis, incorporated into the lexicase model of grammar, has been applied to the prepositional and nominal inflectional categories of Classical and Modern Greek.

Section 5.1.1 summarizes the goals of this study; Section 5.1.2 discusses the localist hypothesis within the lexicase framework as a workable and revealing analysis of the Classical Greek and Modern Greek case-marking systems; and Section 5.1.3 discusses the application of the lexicase framework to the study of the Classical Greek and Modern Greek case-marking systems. Section 5.2 summarizes each category as it was examined in the two languages: prepositions, cases, prepositions and cases combined, declensions, and nominal inflections. Section 5.3 concludes with suggestions for further investigations in these languages, within the localistic-lexicase framework.

5.1.1 Goals of this study

This study has dealt with the prepositional and nominal inflectional systems of two historically related languages as a unified unit of analysis: the case-marking

system. Chapter 2 deals with Classical Attic Greek,
Chapter 4 with Standard Modern Demotic Greek. Chapter 3
covers various modifications to the systems in between these
two static time systems, over a span of two millenia:
changes in the phonological systems and their consequences
for the inflectional, case, declensional, and prepositional
systems.

The localist hypothesis has been applied to both
languages within the lexicase model. The lexicase model
has provided the basis for a formal and explicit system of
rules used to analyze each language and the changes in the
systems.

5.1.2 The localist hypothesis

In this study, the localist hypothesis is upheld both
for Classical and Modern Demotic Greek (Section 2.2, 2.4 for
CG and 4.2, 4.4 for MDG). However, the label for this
hypothesis must be modified to 'localistic' when applied
to the case inflection system of Classical Greek, since
only the three oblique cases can be analyzed into components
of location and direction. Neither the localist nor the
localistic hypothesis is applicable to the case inflection
system of Modern Demotic Greek.

In both languages the nominative and vocative cases
are non-local cases. The nominative NP is considered to
be the grammatical subject, and the vocative, the case of
address. The dative case, which in CG is the case of

location or [-direction], is lost by MDG times through phonological changes, rule simplification, and the loss of resulting competing morphological forms. The genitive case, which in CG represented the local feature [+source], in MDG expresses only attributive relationships and is [+adnominal]. The accusative case, which in CG represented the local feature [+goal], is [-adnominal] in MDG; it plays all the roles except that of attributive relationships and grammatical subjects.

The prepositional systems of both languages are easily analyzable according to the localist hypothesis. The prepositions are analyzed into local semantic components in terms of semantic features shared with other prepositions. One major division for all prepositions in both languages is the feature [±relational]. This feature corresponds to a distinction made by several other scholars: Hjelmslev's *subjectivité* and *objectivité* (1972:132f); Bennett's 'deictic' (1975:36); and Clark's 'relational' (1973:42).

After this initial distinction, the prepositions are further subdivided according to the following local semantic features: surface, association, vertical, comitative, circumambience, source, intimate, and interior; five additional local semantic features are needed to adequately describe the prepositional system of MDG: prolative, terminus, path, side, and proximate.

Localism has also been shown to work well within the
lexicase model. The basic distinction of localism, that of
location and direction, lends itself easily to the binary
feature system of lexicase.

5.1.3 The lexicase framework

The lexicase framework has been applied to a branch of
Indo-European: Greek. The two main formalisms, rules and
tree diagrams, serve to illustrate the relationships among
lexical items and inflectional categories. The rules of
the lexicase framework state the categories and properties
of the items under discussion. The trees illustrate the
relationships among the various elements in the tree.

The use of rules in the investigation of phonological
and phonetic changes in a diachronic study of languages
facilitates the explication of the changes in the system
from one stage to another, and ultimately from one language
to another.

Lexicase is also flexible enough to adjust to language
specific problems while still keeping the basic framework
intact. The major change to the lexicase framework within
this dissertation was the modification of the Phrase
Structure Rule to account for the sequential prepositions
of MDG. Whereas previous analyses of languages in the
lexicase model needed only the following prepositional
PSR:

$$PP \rightarrow P\{^{NP}_{S}\},$$

the new version introduced in this dissertation adds another

PP on the right side of the rule (see Section 4.2):

$$PP \rightarrow P \left\{ \begin{array}{c} NP \\ S \\ PP \end{array} \right\}$$

5.2 Summary of prepositional and nominal systems of Classical Greek and Modern Demotic Greek

A brief summary of each category investigated is

useful to tie the two languages together. This is a dis-

cussion of the major rule changes and retentions from CG to

MDG as stated by the lexicase rules.

The subsections under discussion here proceed in

parallel order with that of Chapters 2 and 4: prepositions,

cases, prepositions and cases, declensions, and nominal

inflections.

5.2.1 Summary of prepositions

Despite the change in the lexicon and the rules for

the prepositions from CG to MDG, the semantic features are

fundamentally the same with the addition of several new

features to account for additional distinctions made in the

set of MDG prepositions. In comparing these features with

those employed in previous lexicase dissertations and with

a preliminary analysis of prepositions in Russian, Finnish,

and Japanese (Starosta, Spring 1977, Liguistics 640T), it

appears that many of these features may be universal.

In the inventory of lexical items, only one preposition comes down semantically unchanged from CG: apo 'from'. However, this preposition is syntactically changed since in CG it occurred with nominals inflected for the genitive case; whereas, in MDG, it is always accompanied by a nominal inflected in the accusative case. Most CG prepositions are lost by Modern Greek times to be replaced by new lexical items.

All CG prepositions are 'simple' prepositions, in that this type of preposition occurs as the only preposition in a prepositional phrase. A few MDG prepositions are also 'simple', but most occur as sequential prepositions. Sequential prepositions are syntactically sequences of two or three prepositions in a single prepositional phrase: a de-adverbial preposition with one or two 'secondary' prepositions. A secondary preposition is one of three simple prepositions: apo, se, or me. For example, 'on' is rendered by epi in CG. By MDG times, however, this preposition is replaced by the sequential preposition epano se 'on, on top of, onto'.

A comparison of the two sets of preposition subcategorization rules in CG and MDG reveals the use of similar semantic features to describe the prepositional systems of the two languages.

Only four new rules are needed to describe the MDG system with added semantic features. The remaining rules

are identical or very similar to those of CG. The majority
of rules are similar in that they usually differ from the
CG rules by only one feature on one side of the arrow. An
example of this similarity is the difference between CG
pSR-4 and MDG pSR-4 and 5. The new feature prolative is
added to the MDG system to account for the fact that the
class of MDG [-assn] prepositions has more subdivisions
than in CG:

CG pSR-4   MDG pSR-4

[-assn] → [±sorc]   [-assn] → [±prol]

                               pSR-5

                               [-prol] → [±sorc]

These rules state that in Classical Greek all [-association]
prepositions are subclassified into [±source]. In Modern
Demotic Greek the [-association] prepositions are divided
into [±prolative], then the [-prolative] prepositions are
further subdivided into [±source].

These two sets of rules actually account for similar
and etymologically related prepositions: CG eis 'to'
[-assn, -sorc] and apo 'from' [-assn, +sorc]; and MDG se
'to,at,in'[-assn, -sorc] and apo 'from'[-assn, +sorc].
The difference is due to the need to account for the MDG
[±prolative] ([+goal]) prepositions ja 'for', pros 'towards',
and mexri 'up to', which also fit into the [-assn]category.

5.2.2 Summary of case inflections

The CG dative case which was [-direction], is lost from the CG system. The CG genitive case, which was [+source], is now the [+adnominal] (attributive) case in MDG. The CG accusative case, which functioned as the [-source, +goal] marker, becomes by default the only [-adnominal] oblique case in MDG, losing its goal specialization in the process.

The only rule which is identical in the two languages is the initial case rule, which subcategorizes all nouns into plural or non-plural and nominative or non-nominative forms.

CG and MDG cSR-1

$$[+\text{N}] \rightarrow \begin{bmatrix} \pm\text{pl} \\ \pm\text{NM} \end{bmatrix}$$

The cause for the drastic change in the Modern rules is the loss of local distinctions within the MDG case system.

The change in the case system also affects the case label redundancy rules. These are rules which are outside the grammar, but which are stated here to show the correspondence between formal grammatical categories and traditional labels:

CG clRR's   MDG clRR's

-1 [+NM] → [+nom]   -1 [+NM]   → [+nom]
-2 [-drcn] → [+dat]   -2 [-adnom] → [+acc]
-3 [-sorc] → [+acc]   -3 [+adnom] → [+gen]
-4 [+sorc] → [+gen]

5.2.3. Summary of combined prepositions and case inflections

The combined preposition and case system of CG is more complex than that of MDG. In MDG the accusative case is the sole case which accompanies the prepositions. Since the accusative case contributes no local components to the case-marking system in MDG, the system of contrasts signaled by the combined system is virtually identical to the contrasts signaled by the prepositions alone. A little over half of the CG prepositions occur with only one of the three oblique cases that can accompany prepositions. In most of these combinations, the inherent semantic local feature of the preposition imposes the choice of local case. An example of this is the preposition ek 'from inside', which occurs only with the directional, source case, the genitive:

```
ek                genitive
+P                +drcn
+nter             +sorc
+sorc
+surf
-reln
```

The complexity of the combined preposition and case system of CG is reflected in the rules. In CG, redundancy rules must be added to block illegal combinations of the prepositions and cases. In MDG, corresponding RR's are needed to state co-occurrence restrictions among preposi-tions, since the MDG system combines all prepositions with one non-local case, the accusative ([-adnominal]). (These

rules have not yet been worked out in detail in this
dissertation.)

To the set of case subcategorization rules and preposi-
tion subcategorization rules (and redundancy rules for CG)
are added a set of prepositional redundancy rules that
list the features of the preposition and the prepositional
lexical entry. This set of rules is added in order to
print-out the prepositions at the appropriate terminal
nodes. These 'prepositional redundancy rules' are not a
part of grammar; their function is only to facilitate
computer-testing the grammar using Robert Hsu's SHOWCASE
program.

5.2.4 Summary of declensions

The major change in the declensional systems from CG
to MDG is the loss of the non-thematic stems as a declen-
sional class. All the classes of nouns subsumed under the
non-thematics have been absorbed by the thematic stems.
The declensional system which in CG was subcategorized
initially with relation to [±thematic] stems, and secondari-
ly with relation to gender, is in MDG subcategorized only
according to gender.

The nominals are classified with reference to the
stem vowel both in CG and in MDG. The CG a-stems and o-stems
are still present in MDG, but as a distinction within the
genders, rather than as declensional divisions. I-stems
are also added as a further subclass within genders.

Due to the loss of the non-thematic stems as a
declensional division, the declensional rules in the two
languages are quite dissimilar. Among the subcategoriza-
tion rules, one rule is identical in the two languages:
the rule that subcategorizes non-neuters into masculine or
non-masculine nominals (CG dSR-5 and MDG dSR-2). One
rule is similar, but simplified: MDG dSR-1 subcategorizes
all nominals into plural ar non-plural forms and into
neuter or non-neuter genders; CG dSR-1 subcategorizes all
nominals into thematic and non-thematic stems as well.

Among the lexical redundancy rules, the one rule which
states that all non-masculines are classified as feminines
obtains for both languages (CG RR-3 and MDG RR-1). CG RR-4
is similar to MDG RR-2 with [-a] in the argument matrix,
but the feature assigned in the resultant matrix differs
between the two languages: [+o] for CG and [+i] for MDG.

5.2.5 Summary of nominal inflections

The nominal inflectional systems are similar from one
language to the next. The MDG system is simpler due to
phonetic or phonological changes and subsequent analogic
leveling in the language. Three suffixal forms are
completely lost from the MDG system. Two forms are dative
plural suffixes which are lost along with the loss of the
dative singular suffix (which is identical to a class of
o-stem nominative plurals). The third suffix is final -n,

which is lost from accusative singular forms with final -n̲

and neuter nominative singular forms with final -n̲.

The loss of the -n̲ from the accusative singular forms

and the loss of final -i̲ from the dative singular forms

resulted in identical morphological forms in the dative

and accusative singular, with the eventual loss of the

dative as a category and subsequent redistribution of the

functions served by the dative into the accusative and

genitive case inflections.

The nominal inflection rules, which are all redun-

dancy rules (mIRR), specify the suffixes of the nominals

according to declension and class within the declensions.

A few inflection rules are lost from CG to MDG. Most

mIRR's are quite similar with changes in features according

to the changes in the declensional and case systems. A

comparison of CG mIRR-1 with MDG mIRR-1 serves to point

out the similarities and differences between the two

languages:

$$
\text{CG mIRR-1} \quad] \rightarrow \text{i]}/ \left\{ \begin{bmatrix} +\text{NM} \\ +\text{pl} \\ +\text{tm} \\ -\text{nt} \end{bmatrix} \\ \begin{bmatrix} -\text{drcn} \\ -\text{pl} \end{bmatrix} \right\} \qquad \text{MDG mIRR-1} \quad] \rightarrow \text{i]}/ \begin{bmatrix} +\text{NM} \\ +\text{pl} \\ +\text{o} \\ -\text{nt} \end{bmatrix}
$$

The second matrix of the CG rule is dropped, since

the entire dative case is lost from the case system. The

first matrix in the CG rule is similar to MDG mIRR-1 with

a difference in the declensional features: the -i̲ suffix

applies to all non-neuter thematic stems in CG; in MDG the
-i suffix is confined to a smaller class of nouns, the
o-stem non-neuters. The -i suffix is retained in the
o-stem masculine, therefore the whole i-suffixing rule
is not lost.

5.2.6 Summary of the case-marking systems

In both CG and MDG, the case-marking system is a
combination of a preposition and an inflected nominal.
In CG the preposition-noun combinations can be divided
into a three-way local system: location, goal, and source.
In MDG the distinction is basically two-way: location and
goal vs. source. In both languages the nominal is inflected
according to declension, case, gender, and number. The
two main differences between the two case-marking systems
are: 1) the case which accompanies the prepositions and
2) the number of P's which can co-occur within a PP. In
CG, barring obvious conflicts of semantic local features
and a few unexplained gaps, the nominal can be in any of
the three oblique cases: accusative, genitive, or dative,
according to the local semantic feature of the preposition,
whereas in MDG the accompanying nominal is always inflected
in the accusative case. The use of sequential prepositions
in MDG on the other hand can be seen as a means of adding
extra local features to PP's to compensate for the loss of
local features in the case inflections.

The basic sets of rules needed to account for the case-marking system are the same for both languages. Both languages require preposition and case subcategorization rules to account for the preposition portion of the case-marking system. Both languages require lexical redundancy rules (for the predictable features of the declensional system), case subcategorization rules, and inflection marking redundancy rules to account for the nominal portion of the case-marking system. The only difference is that in CG a set of contextual feature redundancy rules is needed to block conflicting preposition-case inflection combinations, whereas the corresponding set of RR's in MDG is needed to state co-occurrence restrictions among the sequential prepositions.

5.3 Conclusion

This dissertation has demonstrated the application of the lexicase model to yet another language family. It has included not only the establishment of synchronic rules for the case-marking systems of two languages, but also, since they represent earlier and later stages of the same language, the changes in the rules between the two. The lexicase presentation of tree diagrams and of rule sets has made it possible to write and test formal and explicit statements about the structure of the languages.

It would be interesting to see whether or not the system presented here is applicable to classroom teaching. It is hoped that the patterns discussed here (though not necessarily the rules themselves) would be comprehensible to a general audience interested in either or both languages.

The next step in this analysis of CG and MDG case-marking systems is to include the rules of the pronominal system, since, according to the lexicase framework, the pronominal system is a part of the nominal system, and since pronouns can also appear in prepositional phrases of both languages, establishing themselves as part of the case-marking system.

The integration of the entire Greek verbal system into an analysis stated within the lexicase framework is the next major goal in testing the validity of the model. A study of the verbal system should reveal semantic features parallel to those that have been established as part of the analysis of the case-marking system (cf. Clark, 1978).

APPENDIX A

Dates of Greek Language

Greek	Dates
Mycenean (Linear B)	1600-1100 B.C.
Dark Ages	1100-850 B.C.
Homeric (primarily Ionic)	850-700 B.C.
Archaic/Old Greek 'dialects'	700-500 B.C.
Attic/Classical	500-300 B.C.
Koine/Atticism	300 B.C. - A.D. 330
Vernacular/Classicism	A.D. 330-1453
(Mediaeval	A.D. 1000-1453)
Modern	1453-present

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APPENDIX B

Correspondence Between Orthography and Phonology In Classical Greek and Modern Demotic Greek

uncial	minuscule (orthography)	CG C's	CG V's	MDG C's	MDG V's
A	α		a		a
B	β	b		v	
Γ	γ	g		g,j	
Δ	δ	d		d	
E	ε		e		e
Z	ζ	z/zd		z	
H	η		ē		i
Θ	θ	th		θ	
I	ι		i		i
K	κ	k		k	
Λ	λ	l		l	
M	μ	m		m	
N	ν	n		n	
Ξ	ξ	ks		ks	
O	ο		o		o
Π	π	p		p	
P	ρ	r		r	
Σ	σ,ς	s		s	
T	τ	t		t	
Τ	υ		u		i
Φ	φ	ph		f	
X	χ	kh		x	
Ψ	ψ	ps		ps	
Ω	ω		ō		o
EI	ει		ei		i
OI	οι		oi		i
TI	υι		ui		i
AT	αυ		au		a
ET	ευ		eu		e
OT	ου		ou		u
HT	ηυ		ēu		i
HI	ηι,ῃ		ēi		-
ΩI	ωι,ῳ		oi		-
AI	αι,ᾳ		ai		e

APPENDIX C

Attic Greek Authors

Abbrev.	Author	Dates(B.C.)	Genre
A.	Aeschylus	525-456	Tragic Poet
S.	Sophocles	496-406	"
E.	Euripides	480-406	"
Ar.	Aristophanes	450-385	Comic Poet
T.	Thucydides	? -396	Historian
X.	Xenophon	435-355	"
L.	Lysias	450- ?	Orator
I.	Isocrates	436-338	"
Aes.	Aeschines	389-314	"
D.	Demosthenes	383-322	"
P.	Plato	427-347	Philosopher

Source: Smyth, 1974:4

APPENDIX D

Classical Greek Prepositions

amphi	around, on both sides
ana	up, up along
anti	in front of, opposite
apo	from
dia	through; and out of
eis	to, into
ek	from inside
en	in
epi	on, onto
huper	over
hupo	under
kata	down, down along
meta	with
para	by, near [+human]
peri	by, near
pro	in front of, before
pros	by, near
sun	with

APPENDIX E

Modern Demotic Greek Prepositions

anti(s)	in front of
antikri	opposite
apenanti	opposite
apo	from
brosta	in front of, before
ekso	outside
epano	on, on top of, up, over, above
giro	around
ja	for
kata	according to, depending on, by, towards, down to
kato	down, under, below
konta	near
mazi	with
me	with
mesa	inside
meta	after
para	almost, of, although, in spite of
piso	behind
pros	towards
se	to, in, at
xoris	without

Computer Rules for Classical Greek Combined Case
Inflection   and Preposition Tree

RULES:

```
CSR-1        <+N> <SING/PL  XNM>
CSR-2        <-NM> <%DRCN>
CSR-3        <+DRCN> <%SGRC>
CLRR-1       <+NM> <NOMINATIVE>
CLRR-2       <-DRCN> <DATIVE>
CLRR-3       <-SORC> <ACCUSATIVE>
CLRR-4       <+SORC> <GENITIVE>
RR-1         <+DRCN -SCRC> <+GOAL>
RR-2A        <+GOAL> <-_<-DRCN>>
RR-2B        <+SORC> <-_<-DRCN>>
RR-3         <-DRCN> <-_<-SORC>>
RR-4         <-DRCN> <-_<+SCRC>>
RR-5         <-DRCN> <-_<+DRCN>>
PCSR-1       <+P +N -NM> <SING/PL  XDRCN  XRELN>
PCSR-2       <+DRCN> <%SOPC>
PCSR-3       <-RELN> <%SURF>
PCSR-4       <+DRCN -SURF> <%ASSN>
PCSR-5A      <+ASSN> <%COMT>
PCSR-5B      <-DRCN -RELN -SURF> <%COMT>
PCSR-6       <-COMT> <%CIRC XINTM>
PCSR-7A      <-DRCN +SURF> <%NTER>
PCSR-7B      <+SORC +SURF> <%NTER>
PCSR-8       <+RELN> <%VERT>
PCSR-9       <-VERT> <%INTM>
PCSR-10      <+VERT> <%SURF %NTER>
LPRR-1       <-SORC -RELN -SURF -ASSN +GOAL +DRCN> <EIS>
LPRR-2       <+SORC -RELN -SURF -ASSN +DRCN> <APO>
LPRR-3A      <-DRCN -INTM -CIRC -COMT -SURF -RELN> <PROS>
LPRR-3B      <+DRCN -INTM -CIRC -COMT +ASSN -SURF -RELN> <PROS>
LPRR-4A      <-DRCN +INTM -CIRC -COMT -SURF -RELN> <PARA>
LPRR-4B      <+DRCN +INTM -CIRC -COMT +ASSN -SURF -RELN> <PARA>
LPRR-5       <-SORC -INTM +CIRC -COMT +ASSN -SURF -RELN> <AMPHI>
LPRR-6A      <-DRCN +INTM +CIRC -COMT -SURF -RELN> <PERI>
LPRR-6B      <+DRCN +INTM +CIRC -COMT +ASSN -SURF -RELN> <PERI>
LPRR-7       <-DRCN -RELN -SURF +COMT> <SUN META+GENITIVE>
LPRR-8       <-SORC -RELN -SURF +ASSN +COMT> <META>
LPRR-9A      <-DRCN -RELN +SURF -NTER> <EPI+GENITIVE-EPI>
LPRR-9B      <-RELN +SURF +GOAL +DRCN> <EPI>
LPRR-10      <-DRCN -RELN +SURF +NTER> <EN>
LPRR-11      <+SORC -RELN +SURF -NTER +DRCN> <DIA>
LPRR-12      <+SORC -RELN +SURF +NTER +DRCN> <EK>
LPRR-13      <-DRCN +RELN -VERT -INTM> <PRO+GENITIVE>
LPRR-14      <-DRCN +RELN -VERT +INTM> <ANTI+GENITIVE>
LPRR-15      <+DRCN +RELN +SURF +VERT -NTER> <HUPER>
LPRR-16      <XDRCN +RELN +SURF +VERT +NTER> <HUPO>
LPRR-17      <-SORC +RELN -SURF +VERT -NTER> <ANA>
LPRR-18      <+DRCN +RELN -SURF +VERT +NTER> <KATA>
```

INPUT MATRIX: <+N +P -NM SING/PL>

APPENDIX G
Computer Rules for Classical Greek Combined Nominal Inflection Tree

RULES:

```
CSR-1        <+N> <%PL %NM>
CSR-2        <-NM> <%DRCN>
CSR-3        <+DRCN> <%SORC>
CLRR-1       <+NM> <NOMINATIVE>
CLRR-2       <-DRCN> <DATIVE>
CLRR-3       <-SORC> <ACCUSATIVE>
CLRR-4       <+SORC> <GENITIVE>
DSR-1        <+N> <%PL %TM %NT>
DSR-2        <+TM -NT> <%A>
DSR-3        <-TM> <%SM>
DSR-4        <-SM> <%SN>
DSR-5        <-NT> <%MS>
RP-1         <+TM +NT> <-A>
RR-2         <-SN> <+CN>
RR-3         <-MS> <+FM>
RR-4         <-A> <+O>
MIRR-1A      <+SM +NT +PL +NM> <+S#:O#>
IMRR-1B      <+SM -DRCN> <+S#:J#>
IMRR-1C      <+SM +SORC> <+S#:O#>
IMRR-1D      <+SM -SORC -PL -NT> <+S#:O#>
IMRR-1E      <+SM -SORC +PL +NT> <+S#:O#>
MIRR-2A      <-DRCN +SN> <+V#:E#>
MIRR-2B      <+SORC +SN> <+V#:E#>
MIRR-3       <+SORC -PL -TM> <+#:O#>
MIRR-4A      <-DRCN -PL +FM +A> <+<+CONS +SON -LAT>A#:<+CONS +SON -LAT>EE#>
MIRR-4B      <+SORC -PL +FM +A> <+<+CONS +SON -LAT>A#:<+CONS +SON -LAT>EE#>
MIRR-5A      <-DRCN -PL +O> <+O#:OJ#>
MIRR-5B      <+SORC -PL +SM +NT> <+O#:OO#>
MIRR-6A      <+NM +PL +TM -NT> <+#:I#>
MIRR-6B      <-DRCN -PL> <+#:I#>
MIRR-7A      <+NM +PL +NT +O> <+O#:O#>
MIRR-7B      <-SORC +PL +NT +O> <+U#:O#>
MIRR-8A      <+NM +PL +NT> <+#:A#>
MIRR-8B      <-SORC -PL -TM -NT> <+#:A#>
MIRR-8C      <-SORC +PL +NT> <+#:A#>
MIRR-8D      <-SORC +PL +CN -NT> <+#:A#>
MIRR-9       <-DRCN +PL +CN +NT> <+<+DENT>#:O#>
MIRR-10      <-DRCN +PL -TM> <+#:SI#>
MIRR-11      <-DRCN +PL +TM> <+#:IS#>
MIRR-12A     <+NM -PL -A +NT> <+#:N#>
MIRR-12B     <-SORC -PL +TM> <+#:N#>
MIRR-13A     <+SORC -PL +O> <+O#:OJ#>.
MIRR-13B     <+SORC -PL +MS +A> <+A#:OU#>
MIRR-13C     <-SORC +PL -NT +O> <+O#:OU#>
MIRR-14      <+NM +PL +CN -NT> <+#:E#>
MIRR-15A     <+NM -PL -SM -NT> <+#:S#>
MIRR-15B     <+NM -PL -A -NT> <+#:S#>
MIRR-15C     <+NM -PL +A +MS> <+#:S#>
MIRR-15D     <+NM +PL -TM -NT> <+#:S#>
MIRR-15E     <-SORC +PL -NT> <+#:S#>
MIRR-15F     <+SORC -PL -TM> <+#:S#>
MIRR-15G     <+SORC -PL +A -MS> <+#:S#>
MIRR-16A     <+SORC +PL +TM +O> <+O#:OON#>
MIRR-16B     <+SORC +PL +TM +A> <+A#:CON#>
MIRR-17      <+SORC +PL -TM> <+#:CON#>
MIRR-18A     <+NM -PL -NT +CN> <+<+LOD>VS#:<+LOD>VV#>
MIRR-18B     <+NM -PL -NT +CN> <+<+NAS>VS#:<+NAS>VV#>
MIRR-19A     <+NM +PL +SN +NT> <+VA#:EE#>
MIRR-19B     <-SORC +PL +SN +NT> <+VA#:EE#>
MIRR-19C     <-SORC -PL +SN -NT> <+VA#:EE#>
MIRR-20      <+SORC +SM -NT -PL> <+VO#:OU#>
```

INPUT MATRIX: <+N>

APPENDIX H

Computer Rules for Modern Demotic Greek Combined Case Inflection and Preposition Tree

RULES:

```
CSR-1      <+N> <SING/PL %NM>
CSR-2      <-NM> <%ADNOM>
CLRR-1     <-ADNOM> <ACCUSATIVE>
RR-1       <+PRCL> <+GOAL>
RR-2       <+VERT -SURF> <+GOAL>
RR-3       <+GOAL> <-_<+SORC>>
PSR-1      <+P> <%SORC %RELN>
PSR-2      <-RELN> <%SURF>
PSR-3      <-SURF> <%ASSN>
PSR-4      <-ASSN> <%PROL>
PSR-5      <-PROL> <%SORC>
PSR-6      <+PRCL> <%TERM>
PSR-7      <-TERM> <%PATH>
PSR-8      <+ASSN> <%COMT>
PSR-9      <-COMT> <%CIRC>
PSR-10     <+SURF> <%SIDE>
PSR-11     <+SIDE> <%NTER>
PSR-12     <+RELN> <%VERT>
PSR-13     <-VERT> <%PROX>
PSR-14     <+PROX> <%INTM>
PSR-15     <+VERT> <%SURF %NTER>
LPRR-1     <-SORC -PROL -ASSN -SURF -RELN> <SE>
LPRR-2     <+SORC -PROL -ASSN -SURF -RELN> <APO>
LPRR-3     <-PATH -TERM +PROL -ASSN -SURF -RELN -SORC> <JA>
LPRR-4     <+PATH -TERM +PROL -ASSN -SURF -RELN -SORC> <PROS>
LPRR-5     <+TERM +PROL -ASSN -SURF -RELN -SORC> <MEXRI-SE MEXRI>
LPRR-6     <-SORC -CIRC -COMT +ASSN -SURF -RELN> <KONTA-SE>
LPRR-7     <+SORC -CIRC -COMT +ASSN -SURF -RELN> <APO-KONTA-APO>
LPRR-8     <-SORC +CIRC -COMT +ASSN -SURF -RELN> <GIRO-SE>
LPRR-9     <+SORC +CIRC -COMT +ASSN -SURF -RELN> <APO-GIRO-APO>
LPRR-10    <-SORC +COMT +ASSN -SURF -RELN> <MAZI-ME ME>
LPRR-11    <+SORC +COMT +ASSN -SURF -RELN> <XORIS>
LPRR-12    <-SORC -SIDE +SURF -RELN> <EPANO-SE>
LPRR-13    <+SORC -SIDE +SURF -RELN> <APO-'PANO-APO>
LPRR-14    <-SORC -NTER +SIDE +SURF -RELN> <EKSO-APO>
LPRR-15    <+SORC -NTER +SIDE +SURF -RELN> <AP'-EKSO-APO>
LPRR-16    <-SORC +NTER +SIDE +SURF -RELN> <MESA-SE>
LPRR-17    <+SORC +NTER +SIDE +SURF -RELN> <APO-MESA-APO>
LPRR-18    <-SORC -PROX -VERT +RELN> <PISO-APO>
LPRR-19    <+SORC -PROX -VERT +RELN> <APO-PISO-APO>
LPRR-20    <-SORC -INTM +PROX -VERT +RELN> <BROSTA-SE>
LPRR-21    <+SORC -INTM +PROX -VERT +RELN> <APO-BROSTA-APO>
LPRR-22    <-SORC +INTM +PROX -VERT +RELN> <APENANTI-SE ANTIKRI-SE>
LPRR-23    <+SORC +INTM +PROX -VERT +RELN> <APO-APENANTI-APO APO-ANTIKRI-APO>
LPRR-24    <+NTER -SURF +VERT +RELN> <KATO-SE>
LPRR-25    <-NTER -SURF +VERT +RELN> <EPANO-SE>
LPRR-26    <-SORC +NTER +SURF +VERT +RELN> <KATO-APO>
LPRR-27    <+SORC +NTER %SURF +VERT +RELN> <APO-KATO-APO>
LPRR-28    <-SORC -NTER +SURF +VERT +RELN> <EPANO-APO>
LPRR-29    <+SORC -NTER %SURF +VERT +RELN> <APO-'PANO-APO>
```

INPUT MATRIX: `<+N +P -NM -ADNOM SING/PL>`

APPENDIX I

Computer Rules for Modern Demotic Greek Combined Nominal Inflection Tree

```
                    RULES:

CSR-1               <+N> <%PL %NM>
CSR-2               <-NM> <%ADNOM>
CLRR-1              <-ADNOM> <ACCUSATIVE>
CLRR-2              <+ADNOM> <GENITIVE>
CLRR-3              <+NM> <NOMINATIVE>
DSR-1               <+N> <%PL %NT>
DSR-2               <-NT> <%MS>
DSR-3B              <+NT> <%O>
DSR-3A              <+MS> <%O>
DSR-4A              <-MS> <%A>
DSR-4B              <-O> <%A>
RR-1                <-MS> <+FM>
RR-2                <-A> <+I>
MIRR-1A             <+ADNOM +O> <+O#:O#>
MIRR-1B             <-ADNOM +PL +NT +O> <+O#:O#>
MIRR-1C             <+NM +PL +NT +O> <+O#:O#>
MIRR-2              <+NM +PL -NT +O> <+#:I#>
MIRR-3              <-ADNOM +PL +MS +O> <+O#:U#>
MIRR-4A             <-ADNOM +PL -MS> <+V#:E#>
MIRR-4B             <-ADNOM +PL -NT -O> <+V#:E#>
MIRR-4C             <+NM +PL +MS -O> <+V#:E#>
MIRR-4D             <+NM +PL +FM> <+V#:E#>
MIRR-5A             <+NM -PL +MS> <+#:S#>
MIRR-5B             <+NM +PL -NT -O> <+#:S#>
MIRR-5C             <-ADNOM +PL -NT> <+#:S#>
MIRR-5D             <+ADNOM -PL +FM> <+#:S#>
MIRR-5E             <+NM +PL +FM> <+#:S#>
MIRR-6A             <+ADNOM -PL +NT +A> <+#:T#>
MIRR-6B             <+PL +NT +A> <+#:T#>
MIRR-7A             <+ADNOM -PL +MS +O> <+#:U#>
MIRR-7B             <+ADNOM -PL +NT> <+#:U#>
MIRR-8A             <+NM +PL +NT> <+#:A#>
MIRR-8B             <-ADNOM +PL +NT> <+#:A#>
MIRR-9A             <+ADNOM +PL -NT +I> <I#:ON#>
MIRR-9B             <+ADNOM +PL +A -NT> <A#:ON#>
MIRR-10             <+ADNOM +PL> <+#:ON#>
```

INPUT MATRIX: <+N>

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