

The Role of Derivations in Syntactic Change*

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0. Introduction

In recent years, one of the more widely accepted models of language change in general has been what can be called the "Surface-oriented" model. This model holds that the transmission of language between generations is responsible for many of the changes that occur in linguistic systems. Since a child constructs his grammar on the basis of surface data he hears in the output of the older generation, the surface features of a language are viewed as being the primary motivating force in linguistic change. Accordingly, the reanalysis of ambiguous or opaque surface forms has been recognized as one of the major mechanisms of linguistic change. This model has been applied to phonological change, e.g. by Andersen (1973), and, more importantly, for the matter at hand, to syntactic change, e.g. by Anttila (1972), Ard (1976), Chung (1976), Jamison (1976), Parker (1976), and others.

A particularly clear example of this mechanism of change in the syntactic component of a language is the case of Finnish Subject-to-Object Raising.¹ At one stage of Finnish, in at least some nominal paradigms, the accusative singular, ending in -m, was distinct from the genitive singular:

(1)	NOM	ACC	GEN	
SG	poika	poja-m	poja-n	'boy'
PL	poja-t	poja-t	poik-ien	

Sentences such as (2):

- (2) näe-m poja-m menevä-m
see/1SG boy/ACC go/PTCPL.ACC
'I see the boy go'

were generated by Subject-to-Object Raising, with the subject of the embedded verb being raised to become the object of the matrix verb--the case-marking of accusative on pojam in (2) is a consequence of the change in clause-membership, since the expected case-marking for an embedded subject in such a construction would be genitive. Later, a sound change m \Rightarrow n / _ # made the accusative singular and the genitive singular homophonous, so that a string as in (3):

- (3) näe-n poja-n menevä-n
 see/1SG ACC or GEN ACC or GEN
 'I see the boy go'

was formally ambiguous between pojan as accusative in the matrix clause and genitive and still in the embedded clause. That it was ultimately reanalyzed as genitive is apparent from sentences such as (4):

- (4) näe-n poik-ien menevä-n
 GEN.PL GEN
 'I see the boys go'

where the genitive is used in the plural, even though there as no homophony, and thus no ambiguity, between genitive and accusative plural forms. In (4), then, there was no Subject-to-Object Raising. Therefore, a reanalysis of an ambiguous surface form led to a change in the construction of sentences such as (2) through (4) and also to a loss of Subject-to-Object from the production of these sentences.

Thus the cause of change and the locus of change are viewed to both be at the surface, as the Finnish example illustrates. This view is opposed to the views of early Transformational diachronic syntax, e.g. Klima (1964), Klima (1965), Closs (1965), Closs-Traugott (1969) and others, in which syntactic changes originated in deep elements, i.e. in the rules by which constructions were produced.

This current view of the pre-eminence of surface factors in syntactic change has recently been extended by Naro (1976). In discussing the origin of the reflexive impersonal construction with se in Portuguese, which, he hypothesizes, arose through a reanalysis of passive sentences with se as actives, Naro asserts that "considerations of derivation [Emphasis added: BDJ] appear to be incapable of explaining the genesis of the se-impersonal" (p. 801-2) and furthermore, that syntactic change can therefore be "viewed as a process that is critically dependent on the surface properties of language and essentially independent of grammatical derivations" (p. 779). In effect, then, he is putting forth the claim that the derivational history of particular surface strings, i.e. which syntactic rules went into their generation, does not play a role in syntactic change. Syntactic change, in such a theory, is a "blind" process, operating strictly on information present in surface structures.

In this paper, some changes in the syntax of Greek between Medieval and Modern times are presented, which, it seems, must be explained with reference to deeper fac-

tors, especially to the derivational history of particular surface strings. This result directly falsifies Naro's claim and furthermore, runs counter to the recent trend toward explaining syntactic change on the basis of superficial factors alone.

In particular, the fates of two constructions in Greek are considered, Complement Object Deletion and Infinitival Relative Clauses, which each involved a different deletion rule. These two constructions had similar surface configurations in Medieval Greek and the deletion rules involved in their production, although different rules to be sure, nonetheless had similar effects. However, these two constructions changed in very different ways between Medieval and Modern Greek when affected by a particular morphological change, the replacement of the infinitive by finite verb forms.

The contrast in the respective fates of these two constructions is very instructive in falsifying Naro's claim. In the sections that follow, some background regarding this morphological change and these constructions is given.² Then, a surface-oriented account of the changes is contrasted with an account that takes deeper factors into consideration.

1. The Loss of the Infinitive

One of the most striking changes that occurred in the verb morphology of Greek between Classical and Modern Greek is the loss of the verbal category of Infinitive. The infinitive in Classical Greek was an important and productive category, with a variety of forms and a variety of uses, many of which are quite parallel to the use of the English infinitive and so do not need to be illustrated or listed.³ By Biblical (Hellenistic) Greek times, though, the domain of the infinitive was in the process of being severely restricted. In almost all of its uses, the infinitive was being replaced by finite verbal forms, generally marked with the particle *hina* (later *na*). The infinitive and its finite-verb replacement could even occur conjoined in the same sentence, as this passage from the New Testament shows:

- (5) *thelō de pantas humas lalein glossais*
 want/1SG Part. all/ACC you/ACC speak/INF tongues/DAT
mallon de hina propheteuēte (1Cor. 14:5)
 rather that prophesy/2PL.SUBJ
 'I want you all to speak in tongues or rather to prophesy'.

This process of replacing the infinitive by finite verbal forms continued up through Medieval Greek, spreading gradually through the grammar and through the lexicon, affecting some constructions before others and some lexical items before others. By about the 16th century, the status of the infinitive reached its present position--in Modern Greek today, the infinitive remains just in a handful of isolated lexical items and fixed phrases, some of which are revivals from the learned, archaistic language, and as a grammatical formative in the perfect tense system; these are shown in (6a) and (6b) respectively.⁴

- (6) a. to fili 'kiss' < to phileĩn
to fagi 'food' < to phageĩn
to éxi 'possessions' < to ékhein
to lisi 'solution' < to lúsein
fer' ipi(n) 'for example' < ...eipeĩn 'say'
- b. exo grapsi 'I have written'
ixa grapsi 'I had written'
(grapsi < Med'l. grapsei(n) < Classical grapsai
by analogical changes).

Thus one can effectively claim that Modern Greek lacks an infinitive, certainly as a productive verbal category.⁵

2. Object-Deletion

The first construction of interest here utilized the infinitive in earlier Greek (Classical up through early Medieval Greek), but then gave way to the infinitive-replacement process in late Medieval Greek, with rather interesting results. This is the Object Deletion construction, in which the object of a subordinate clause is deleted under identity with the subject of a higher clause. This process can be illustrated by English sentences such as (7):

- (7) a. Mary_i is pretty to look at \emptyset_i .
b. This rock_i is too heavy for us to lift \emptyset_i .
c. The cake_i is ready for you to put \emptyset_i in the oven.

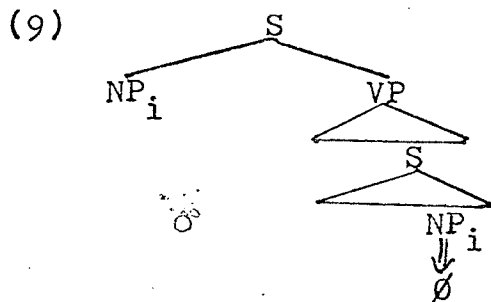
Note that different processes may be at work in the different sentences of (7), but they nonetheless can all be grouped together as a rule class, i.e. a group of rules sharing some crucial property, in this case, the ability to delete subordinate clause objects under identity with matrix clause subjects.

This process of Object Deletion existed in Greek from Classical times up through Medieval Greek--representative examples from the Classical, Biblical, and Med-

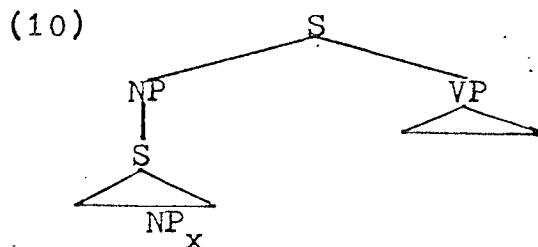
ieval eras are given in (8):

- (8) a. kai gar horan stugnos ēn (Xen. Anab. 2.6.9)
 and Part. see/INF gloomy/NOM was/3SG
 'And he was gloomy to look at'
- b. kai ēn ho trugētos hetoimos
 and was/3SG the-harvest/NOM ready/NOM
 tou therizein (1Sam. 13:21)
 Part. harvest/INF
 'And the harvest was ready for harvesting'
- c. mē phobou, gunai, tēn gennan/
 not fear/2SG woman/VOC the-childbirth/ACC
 tou pathein kakōtikon gar (Hermoniacos Byz. Iliad A' 43-44 (12 c.))
 Part. suffer/INF hurtful/NTR though
 'O woman, do not fear the childbirth,
 though (it may be) a hurtful thing to suffer'

The main claim of the Object Deletion analysis of these sentences is that they derive from a deep structure as in (9) by the operation of a complement Object Deletion process:



A detailed justification of this analysis is beyond the scope of this paper. Note, though, the trigger matrix adjectives that occur in sentences like (8) are never found in Greek with a sentential subject, so they do not seem to independently govern a structure amenable to a process such as Tough-Movement in English, such as that in (10):



A movement analysis is the only other viable alternative to the Object Deletion analysis, and the fact mentioned above argues against such a proposal. Furthermore, all of the subordinate verbs in (8) are generally transitive, therefore, some device is needed to explain the acceptable absence of a surface object with these verbs in just this context. The Object Deletion analysis provides a mechanism for this, and therefore explains both of these facts about sentences like (8).

One feature of Object Deletion sentences in earlier Greek is that an infinitive always appeared in the subordinate clause. When the Infinitive-Replacement process finally reached the Object Deletion construction, an interesting change took place. Sentences with the same underlying structure as Object Deletion sentences are found, with a finite verb in place of the infinitive in the subordinate clause and also an object pronoun, coreferent with the matrix subject, along with this finite verb. A late Medieval example and some Modern examples of such sentences are given in (11):

- (11) a. eipe tēs na ekhēi hetoimon ton
 said/3SG to-her have/3SG ready/ACC the-
 daon_i na ton_i eparēi (Lyb. and Rhod. 2663
 torch/ACC it/ACC take/3SG ed. Wagner (14 c.))
 'He told her to have the torch ready for him
 to take'
 (Literally: "He told her that she have the torch
 ready that he take it")
- b. o musakasi ine etimos na ton_i/*∅
 the-mousaka/NOM is/3SG ready/NOM it/ACC
 valome s ton furno
 put/1PL in the-oven/ACC
 'The mousaka is ready for us to put in the oven'
 (Literally: "The mousaka is ready that we put
 it in the oven")
- c. i Maria_i ine omorfi na tini/*∅
 Mary/NOM is/3SG pretty/NOM.FEM her
 kitazis
 look-at/2SG
 'Mary is pretty to look at'
 (Literally: "Mary is pretty that you look at
 her").

The presence of this object pronoun in the subordinate clause is obligatory--its absence in the sentences of (11)

yields ungrammatical sentences.

The presence of this pronoun means that the subordinate clauses in these sentences still have their direct objects. No deletion has taken place: the coreferent nominal in the lower clause has simply been pronominalized. Since nothing is deleted, there is no motivation for positing a rule of Object Deletion in late Medieval Greek or Modern Greek. Therefore, this construction has changed so as to require a pronoun where earlier one did not occur, and the deletion rule which produced this construction in earlier Greek has been lost from the grammar.

It is necessary to ask how and why this change took place, but before answering that, it is necessary to look at the second deletion construction, the Infinitival Relative construction.

3. Infinitival Relatives

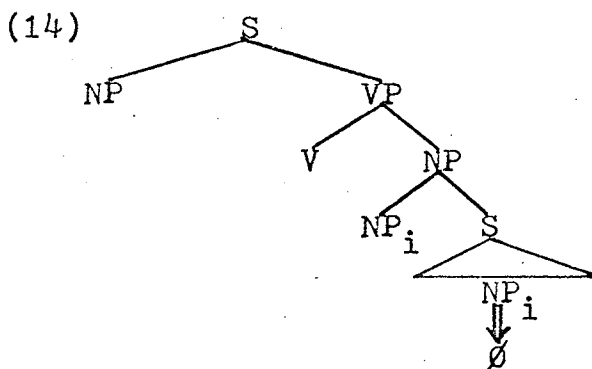
Infinitival Relative Clauses are constructions analogous to the English sentences of (12):

- (12) a. I found a book_i for you to read \emptyset_i .
b. I have no news_i to tell you \emptyset_i .

As is clear from the parallel with the sentences of (13), Infinitival Relatives such as those in (12) have the meaning of Relative Clauses:

- (13) a. I found a book that you might read.
b. I have no news that I might tell you.

The basic claim of the analysis of this construction⁶ is that a nominal controlled by an infinitive in a Relative Clause structure is deleted under identity with the head noun of the Relative Clause by the rule of Relative Deletion--the deep structure is roughly as in (14):



The rule of Relative Deletion which operates in this con-

struction is independently needed to generate Relative Clauses headed by the complementizer that, which can be optionally omitted:

- (15) a. This is the man_i (that) Jane married \emptyset_i .
 b. Here is the house_i (that) I live in \emptyset_i .

A similar construction existed in Greek up through Medieval times--some examples from the Medieval period are given in (16):

- (16) a. allēn korē na brēis perilampasein
 other-girl/ACC FUT find/2SG embrace/INF
 kai philēsein (Erotopaignia 364
 and kiss/INF (15 c.))
 'You will find another girl to embrace and kiss'
 b. loipon legete tipote an ekhete ti
 so say/IMPV something if have/2PL something
 legein (Quadrupeds 568
 say/INF (14 c.))
 'So say something, if you have something to say'.

The semantics of these sentences are parallel with Relative Clauses, and the same types of verbs seem to function in the Greek and the English construction, e.g. have, find, look for, etc. Thus the analysis of these Greek sentences as Infinitival Relatives is certainly quite plausible.

One crucial feature of this construction is that, as its name implies, an infinitive always occurred in the subordinate (i.e. relative) clause. Therefore what happened when the Infinitive-Replacement process reached this construction is very interesting. From about the 16th century on, this construction occurs with a finite verb marked with the particle na in place of the infinitive, but with no other changes. In particular, deletion of the object of the subordinate clause is still possible. This is also the case in Modern Greek. Some Medieval and Modern examples of this construction with a finite verb are given in (17):

- (17) a. den eikha ti na poisō (Rimada Alexandrou
 not had/1SG something do/1SG 2135 (15 c.))
 'I had nothing to do'
 b. vrika ena vivlio na diavaso
 found/1SG a-book/ACC read/1SG
 'I found a book to read'.

ieval examples of Object Deletion structures with a finite verb have the pronoun in the subordinate clause, as do all such sentences in Modern Greek.

In the case of the Infinitival Relative construction, an account within the framework of this theory could posit the same type of options as indicated in (18) for Object Deletion, at the point at which the infinitive was replaced by a finite verb. However, it would have to claim that in this case, for some reason, the option with the pronoun was not generalized over the the option which maintained the deletion.

It is clear that there is no real explanation in this account--no reason is given for why one option should have been generalized over the other, in the case of Object Deletion, or why it should have been one option and not the other which won out. Nor is a reason given for why the Infinitival Relative construction should have undergone a different treatment. One must hold essentially that this was an unconditioned syntactic split, so to speak.

Furthermore, in this account, since the difference between Object Deletion and Infinitival Relatives is entirely a matter of accident, an equally likely outcome would have been for Object Deletion to continue as it had, i.e. for (18a) to be the Modern Greek type, and for the Infinitival Relative construction to require a pronoun obligatorily in the subordinate clause of its Modern Greek counterpart. That is, the changes, under this account, could just as easily have been the reverse of what is actually attested--it is totally accidental that they turned out as they did. Thus, this account does little more than just restate the historical developments and cannot explain the different development of these two superficially similar constructions.

A more satisfactory account of these changes would give a reason for why these constructions changed as they did, and thus explain the difference between them. In the next section, such an account is given. However, this explanation requires that diachronic syntactic theory give up Naro's strong claim that derivations do not figure at all in syntactic change.

5. A "Deeper" Account

The key to the explanation of these changes in Greek syntax lies in the fact that the rule of Object Deletion appears to be universally constrained so as not to delete the object in a clause containing a finite verb, whereas the rule of Relative Deletion, operative in the Infinitival Relative construction, is not subject to such a constraint on its application. Therefore, the replacement

of the infinitive by a finite verb in the Object Deletion construction brought on a situation in which the rule of Object Deletion could not apply, for it would necessarily be operating into a finite clause, in violation of this universal.

The universal constraint on Object Deletion can be stated somewhat more formally as in (19):⁹

- (19) Object Deletion cannot delete the object in a finite clause.

It is necessary to give some empirical content to the notion "finite" mentioned in this constraint--in English, for example, the finite verbs can be identified as those that can occur with the complementizer that; in Greek, there are a variety of tests for finiteness--only finite verbs can occur with the negative particle den, only finite verbs can be marked for person agreement, and finite verbs have clitic pronouns placed to their left.¹⁰ Thus, in both English and Greek, there are independent reasons to distinguish a class of finite verbs from a class of non-finite verbs. In a language in which there were no such independent tests for finiteness, the universal in (19) would make no prediction; that is, it holds only for languages with a clear distinction between finite and non-finite verbal forms.¹¹

This proposed universal can be justified on the basis of facts from several languages. For one thing, it certainly held in earlier stages of Greek, to judge from the exclusive use of the non-finite verbal form, the infinitive, in Object Deletion sentences in Classical, Biblical, and early Medieval Greek. Furthermore, the following sentences demonstrate the effects of this constraint in English:

- (20) a. Jane is too ugly for us to be able to convince
Ted that he should kiss her.
b. *Jane is too ugly for us to be able to convince
Ted that he should kiss \emptyset .
c. Jane is too ugly for us to be able to convince
Ted to kiss \emptyset .
- (21) a. ??The cookies are ready for you to tell John that
he can put them in the oven.
b. *The cookies are ready for you to tell John that
he can put \emptyset in the oven.
c. The cookies are ready for you to tell John to
put \emptyset in the oven.

Note in particular the pairs (20b) and (20c), and (21b)

and (21c), in which the clause whose object is deleted differs in finiteness between each member of the pair, and in which that difference matters for the acceptability of the deletion. Sentences (20a) and (21a) show that the string can surface, albeit with less than perfect results in the case of (21a),¹² with a finite subordinate clause as long as there is an object pronoun in that clause, i.e. as long as Object Deletion has not applied.

Also, this constraint holds in various other Indo-European languages, both ancient and modern, including Vedic Sanskrit, French, Dutch, and Classical Modern Irish. And, it seems to hold in other genetically unrelated and typologically distinct languages, including Classical Mongolian and Korean, in which only non-finite forms are used in Object Deletion contexts.¹³

Thus there is a strong basis to work from in calling this principle a linguistic universal. Therefore, if this constraint is universal, as it appears to be, then the developments with Object Deletion could not have taken any other direction--the appearance of the object pronoun in the subordinate clause of Object Deletion structures in late Medieval Greek and therefore the loss of the rule of Object Deletion can be explained by the interaction of this universal constraint with the morphological replacement of the infinitive by finite verbs.

This explanation means that deeper factors, especially aspects of the derivational history of a particular string, must play a role in determining syntactic change. In particular, the fact that the Object Deletion construction was derived by the specific rule of Object Deletion which had this specific universal constraint on it was the crucial factor in determining that this construction would change and the direction that the change would take.

The correctness of this explanation is confirmed once the Infinitival Relative construction and its development are considered. As shown earlier in section 3, there was essentially no change in this construction other than the replacement of the infinitive by a finite verbal form--in particular, the deletion of the object by Relative Deletion was still possible in the later construction.

The reason for this appears to be that the rule of Relative Deletion is not prevented universally from applying into a finite clause. That is, it is not subject universally to a constraint such as the one on Object Deletion, and therefore, there was nothing to force the construction to change.

That Relative Deletion is not subject to such a constraint universally is shown by English sentences such as (22), for the Relative Deletion rule operative in those sentences can be equated with the Relative Deletion rule

operative in Infinitival Relatives.¹⁴

- (22) a. This is the house_i (that) I live in \emptyset_i .
b. Jane is the woman_i I thought that Ted⁻
would marry \emptyset_i .

This situation is found in many other languages also, including Basque, Malay, and others,¹⁵ so it clearly cannot be the case that Relative Deletion is universally constrained so as not to apply into a finite clause. That being the case, then, as noted earlier, there was no reason for the construction to change, nothing compelling it to have an object pronoun in the subordinate clause once the infinitive was replaced, because the rule involved in its generation was not subject to a universal constraint such as (19).

6. Conclusion

The contrast between the change in Object Deletion and the lack of a real change in the Infinitival Relative construction is very instructive, then, for showing the role that derivational information and universals can play in syntactic change. Both constructions in earlier Greek had a surface infinitive with its object deleted under identity with an NP in a higher clause. However, the deletion rules effecting that deletion were different for each construction, and that difference in derivational history was crucial in determining which of these constructions would change and in what direction it would change, because the rules were not subject to the same universal constraint.

A theory of syntactic change which recognizes the role of derivational information and consequently of universal constraints which may hold on certain stages of that derivation predicts this difference in the development of the Object Deletion and the Infinitival Relative constructions. In a strictly surface-oriented theory, however, where derivations do not play a role in syntactic change, this difference is totally unexplained and furthermore, completely unexpected.

The conclusion to be drawn from these examples, then, is that Naro's strong claim cannot stand, for aspects of the derivational history of surface strings can and must play a role in determining these syntactic changes in Greek. Therefore, syntactic change cannot be a totally "blind" process, operating strictly at the surface, but must at times take deeper factors into consideration.

This observation poses a very interesting problem for diachronic syntactic theory. The account given here of the developments with Object Deletion and Infinitival

Relations between Medieval and Modern Greek depends crucially on the retention of some derivational information in syntactic change; however, the reanalysis paradigm for syntactic change discussed in the Introduction, which certainly has some validity as a mechanism of syntactic change to judge from the number of convincing cases in the literature, depends crucially on the obscuring of derivational information in syntactic change, for only if the derivation of a particular string is not clear can reanalysis freely take place.

Thus there is a contrast between some syntactic changes in which derivational information is retained on the surface and some in which it is obscured on the surface. It is a task for future research to determine the conditions under which one type of change will occur and not the other, for at the moment, there appears to be no clear dividing line between the two types of change.

NOTES

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1. Cf. Anttila (1972: 103-104) and Breckenridge and Hakulinen (1976) for further details and discussion.

2. See Joseph (1978) for further details concerning these constructions in earlier stages of Greek as well as in Modern Greek and English.

3. The reader is referred to any standard grammar of Classical Greek, e.g. Kühner-Gerth (1904) or Smyth (1920) for details of the usage of the infinitive in Classical Greek.

4. Modern Greek examples here and throughout this paper are given in a roughly morphophonemic transcription--the stress accent is generally not noted, although it is in (6a) because of the correspondence with the Classical Greek pitch accent. All examples from earlier periods of Greek are given in a transliteration of written Greek, and no claims are made as to the phonetic content of this transliteration, especially for later stages of Greek.

5. For further details concerning the loss of the infinitive and the history of the infinitive in Greek, see Joseph (1978: Chapter 2), Hesseling (1892), and Burguière (1960).

6. See Berman (1974a), (1974b) for details of the analy-

sis of this construction.

7. Stahlke (1976) demonstrates that Relative Clauses headed by (that) in English are derived by a deletion process. Similar arguments can be constructed to show that Greek independently has a Relative Deletion rule.

8. It is not essential for the pronoun-variant to have been "created" at this point, under this account. That is, the account could claim that the pronoun-variant existed with an infinitive in the subordinate clause prior to the replacement of the infinitive. Then, the replacement of the infinitive alone gave the finite-verb-plus-pronoun variant. However, there is no good textual evidence for such a prior stage with a subordinate-clause pronoun plus an infinitive.

9. In stating this constraint in this manner, I am begging the question of where in a derivation it holds, whether it is a global constraint, etc.

10. The non-finite forms, including the active participle (or gerundive), the medio-passive participle, and the imperative, have none of these properties. See Joseph (1978: Chapter 7) for details.

11. The Polynesian language Niuean furnishes an example of such a language with no finite/non-finite distinction. Principle (19) makes no claim regarding the status of Object Deletion in that language.

12. Still, there seems to be a clear difference between (21a) with no deletion and (21b) with deletion into a finite clause, and that difference is instructive for showing the effects of this constraint.

13. See Joseph (1978: Chapter 7) for some of the details concerning Object Deletion in these languages.

14. In particular, they both operate on the same structural configuration, effect the same structural change, and can both operate over an unbounded variable. In Greek, the realization of the Relative Deletion rule in regular Relative Clauses and in the continuation of older Infinitival Relatives both have the ability to delete a preposition along with its object. Thus the rules appear to be non-distinct.

15. See Peranteau, Levi, and Phares (1972), and Keenan and Comrie (1977) for details on Relative Clause Formation in a variety of languages.

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Classical and Biblical Greek sources are noted with standard abbreviations and can be found in the standard editions of the work in question. Medieval Greek literature is less familiar and less accessible than Classical or Biblical works, so it seems advisable to include references for the abbreviations given in this paper for Medieval citations.

Erotopaignia:

Hesseling, D.C. and H. Pernot, Erotopaignia (Chansons D'Amour) publiées d'après un manuscrit du XVe siècle avec une traduction, une étude critique sur les EKATALOGIA (Chansons des cent mots), des observations grammaticales et un index, Paris: Librairie Universitaire, 1913.

Hermoniacos Byz. Iliad:

Legrand, E., ed., La Guerre de Troie, Poème du XIVe siècle en vers octosyllabes par Constantin Hermoniacos publiée d'après les manuscrits de Leyde et de Paris, Paris: Maisonneuve et Cie, 1890.

Lyb. and Rhod.:

"The Romance of Lybistros and Rhodamne", ed. W. Wagner, in Trois Poemes Grecs du Moyen-Age, Wagner, ed., Berlin: S. Calvary & Cie, 1881, pp. 242-349 [Naples Ms. Version].

Quadrupeds:

"The Fable of the Four-Footed Animals", ed. W. Wagner, in Carmina Graeca Medii Aevi, Wagner, ed., Leipzig: Teubner, 1874, pp. 141-178.

Rimada Alexandrou:

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