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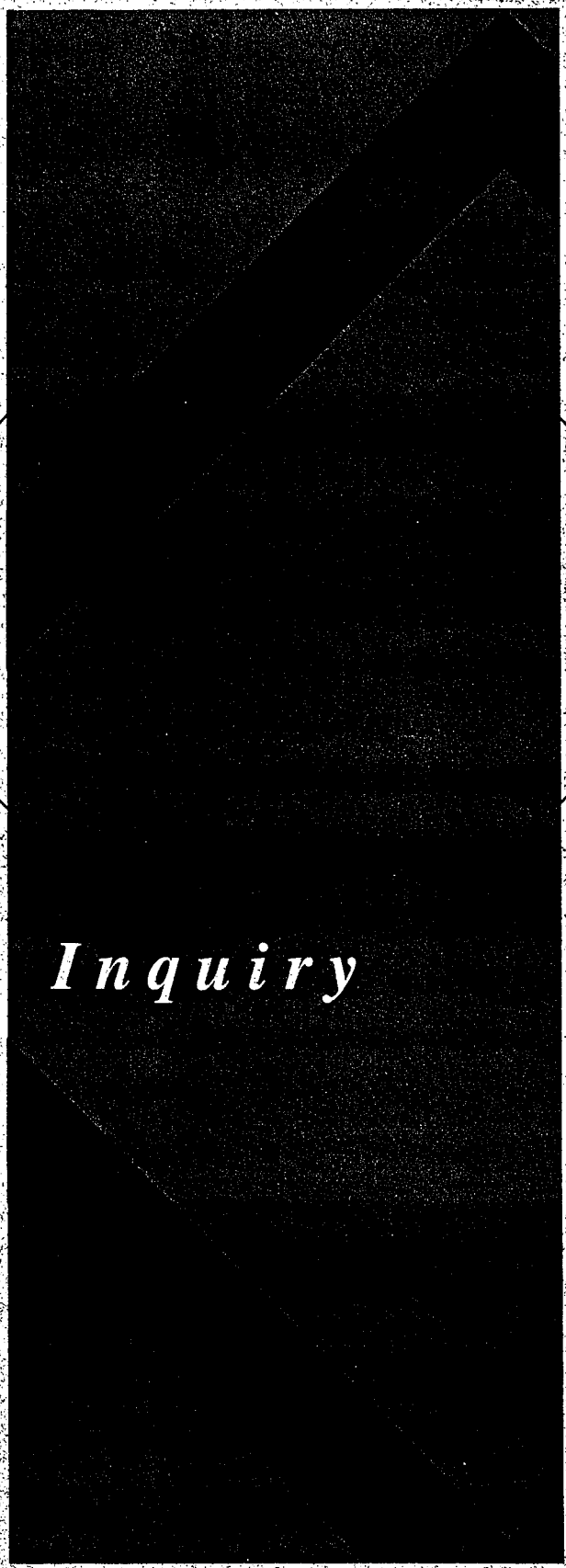

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The Morphosyntax of the Modern Greek Verb as Morphology and Not Syntax

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Since Pollock 1989, many analyses have treated the markings for such verbal morphosyntactic categories as aspect, voice, tense, or agreement as a matter of the internal syntax of the verb, starting from structures in which the morphemes for each category head their own maximal projections and positing a rule of verb raising to combine the morphemes in the appropriate order.

An underlying assumption of most such "exploded Infl" analyses is that the range of possible morphological operations is restricted to affixation—that is, to the addition to a root of elements with segmental material that can be directly represented in tree structures and manipulated by rules of syntax. This view leads to a serious general methodological issue that any Pollock-style analysis must face: there are languages that give evidence of morphological processes other than affixation, such as vowel change (apophony), suppletion, subtraction, and portmanteau realization. Moreover, there are various explicit formal frameworks for explaining morphological structure and morphological operations, such as Anderson's (1992) "a-morphous morphology" or Zwicky's (1992) "interface program," which have taken note of these processes and follow

We would like to thank Rich Janda, Tom Ernst, Robert Levine, and Arnold Zwicky for useful discussion of some key points in this analysis, and two anonymous reviewers for several insightful suggestions. Some of the ideas contained herein were first aired at the University of Thessaloniki in 1991 (see Joseph 1992), and refined and expanded in a joint paper at the 1992 meeting of the Linguistic Society of America; the audiences at those presentations provided important comments that we have incorporated here. Final responsibility for the views expressed herein remains with the authors.

the general "process morphology" approach (see Anderson 1992 for discussion) in which nonroot morphemes are "not listed morphemes, but rather [are] operations on the form of words" (Anderson 1992:72). Admittedly, some morphological processes, especially apophony, may be amenable to treatment as affixal morphemes that are autosegmental templates, but others are not. In particular, it is hard to see how subtraction or suppletion could be meaningfully handled in that way. The basic difficulty, therefore, is that a node in a syntactic tree can readily be conceived of as dominating segmental or even autosegmental material, but not as dominating a process, which is not itself phonological material.

It is therefore of particular interest to see how an analysis of the type proposed by Pollock would fare for a language that apparently puts several of these operations to use in its verbal morphosyntax. One such language is Modern Greek, for which a Pollock-style affixation-based analysis has been proposed by Rivero (1990). Greek therefore provides an excellent arena in which to contrast and evaluate the merits of these two approaches to verbal morphology.[1]

In Rivero's account of the morphosyntax of the Modern Greek verb, the morphemes for Agreement, Tense, Aspect, and Voice all head their own maximal projection and the application of a rule of verb raising gives the attested order of morphemes. Moreover, Rivero claims that nonactive (traditionally called "mediopassive") voice in Modern Greek is structurally adjacent to the verb. Thus, a perfective past nonactive form of the verb *pléno* 'wash', given in (1a), has the internal structure indicated in (1b).

(1) a. plíθikan
wash/3PL.PAST.PERFECTIVE.NONACTIVE
'they were washed; they washed themselves'
b. $[_{AgrP}\ [3PL]\ [_{TnsP}\ [+PST]\ [_{AspP}\ [+PRFCTVE]\ [_{VoiceP}\ [-ACT]\ [_{VP}\ [plen\text{-}]]]]]]$

Implicit in such a structure is the morphemic segmentation given in (2), where *-θ-* marks nonactive voice, *-ik-* marks perfective aspect, *-a-* marks past tense, and *-n-* marks third person plural.

(2) plí - θ - ik - a - n
ROOT VOICE ASPECT TENSE AGR

[1] Rivero discusses both Greek and Albanian, but we focus here just on her analysis of Greek, given our familiarity with this language. Since there are general methodological points at issue here, we believe our objections hold for any language with a Greek-like verb (for discussion, see Anderson 1992, Janda and Kathman 1992). Indeed, as noted by an anonymous reviewer, even English, with tense suppletion in *go/went*, presents a similar problem on a limited basis.

Rivero claims several benefits for this analysis. Once the morphemes are represented as in (1b), then the relative embedding of morphemes in this structure yields the left-to-right order of morphemes in the verb itself, as a result of the operation of verb raising.[2] Voice is more deeply embedded in this syntactic representation and occurs in an internal position next to the verb, whereas person and number agreement is least embedded and is external. Thus, Rivero assimilates the morphosyntax of the Greek verb to Pollock's analytic framework, in an attempt to provide some cross-linguistic support for this framework originally worked out for English and French. Moreover, Voice in this analysis is positioned adjacent to the VP and to the terminal V node itself, thereby satisfying the adjacency and sisterhood requirement posited for the English nonactive Voice morpheme by Baker, Johnson, and Roberts (1989).

Despite these apparent benefits, we argue here that Rivero's analysis is flawed, on both empirical and methodological grounds.[3] We propose that an entirely different approach to the morphosyntax of the Greek verb is called for in which morphosyntax is not treated as if it were syntax, part of syntactic tree structure, but rather is treated as if it were morphology, and thus part of a separate morphological component.

First of all, the segmentation in (2) that is implicit in Rivero's analysis cannot be correct, as (3)–(5) make clear. More important, though, the proposed segmentation is wrong in a way that focuses on the problems imposed on any such analysis by an affixation-only approach to morphology. For example, *-ik-* is not a marker of aspect, or more precisely, is not exclusively an aspect marker. Rather, *-ik-* marks nonactive voice, past tense, and perfective aspect all together. If any one of these features is not present, *-ik-* fails to occur. Thus, the form *pliθún* is nonactive and perfective but not past, and it lacks *-ik-*:

(3) θa pliθún
FUT wash/3PL.NONACTIVE.PERFECTIVE.NONPAST
'they will be washed'

[2] In addition, Rivero's account needs readjustment rules here to derive the stem form *plin-* from *plen-* + *-θ-*, and the alternation between *plin-* and *pli-*; the loss of *-n-* cannot be purely phonological in nature, because of mediopassive perfective forms such as *esθán-θ-ika* 'I felt' (cf. present imperfective *esθán-ome* 'I feel') with an *-n-θ-* sequence.

[3] The empirical problems, although important for the correct analysis of Greek, are less significant for the theoretical issues. Still, there are some forms in which certain morphemic identifications appear problematic for Rivero's analysis. For example, if the mediopassive perfective *γelástika* 'I was deceived' (cf. present imperfective *γeláo* 'I laugh (at)') has the same *-s-* morpheme as in the active perfective *γelá-s-a* 'I laughed (at)', and if that *-s-* is identified as the perfective marker (as implicit in the segmentations in Householder, Kazazis, and Koutsoudas 1964:120–121), then the order of morphemes would be, contrary to Rivero's expectations, VERB-ASPECT-VOICE-ASPECT.

The form *plínane* is past and perfective but active, and again lacks *-ik-*:

(4) plínane
wash/3PL.ACTIVE.PERFECTIVE.PAST
'they washed (something)'

Finally, the form *plénondan* is nonactive and past but not perfective, and it too lacks *-ik-*:

(5) plénondan
wash/3PL.NONACTIVE.IMPERFECTIVE.PAST
'they were being washed'

Taken together, the forms in (3)–(5) show that when *-ik-* does occur, it is always in the realization of forms that are simultaneously nonactive, past, and perfective; that is, *-ik-* is involved in the cumulative exponence for the realization of several categories at once and cannot therefore simply be dominated in a tree by a single category node such as Aspect.[4]

Moreover, it turns out that this issue is not restricted to the identification of the category marked by *-ik-* in Rivero's analysis, but instead represents a more general problem with her approach. Such cumulative exponence is a pervasive property of Greek verbal morphology, with every element of form being a partial exponent of several morphosyntactic features. Thus, it is not possible simply to identify—as Rivero tries to do—a single affix that is the exponent of each morphosyntactic category so as to yield a one-to-one mapping of morphemes and categories; no inflectional category can be straightforwardly matched with a single marker, nor can any individual marker be linked to a single category. An "exploded Infl" approach to the structure of the verb therefore does not truly reflect the surface morphology, for the morphemes cannot be distributed individually over the tree, and it thus cannot appeal to surface morphology for support.

To see how impossible it is to achieve such a one-to-one matching, consider the full paradigms of the verb given in (6). These paradigms show that in a verb form such as the 3pl present imperfective mediopassive *plénonde* 'they are being

[4] We are adapting the term *cumulative exponence* from Matthews 1974:147ff., using it for all types of multiple exponence. Technically, Matthews distinguishes between *cumulative exponence* and *overlapping exponence*, the former being reserved for categories that are never expressed independently (e.g., person and number in Greek) and the latter for categories that happen to coincide in a particular form or paradigm. He uses the term *extended exponence* for the distributed realization of a category across several morphemic pieces, as in the past nonactive perfective where the exponents of [+ past] are *-ik-* as well as the endings. By and large, these distinctions may be finer than needed to make our point here.

washed; they are washing themselves', *plen-* is clearly the root. However, it has that form only in the imperfective aspect and thus contrasts with *plin-*, the root form in the perfective (and indeed with *pli-*, the root form found in the perfective mediopassive). Following the root is a complex of segments (shown here in boldface) that collectively are the exponents of a complex of the features for voice, aspect, tense, person, and number. Clearly, then, no single element in this complex can be isolated as the exclusive marker for a given morphosyntactic category.

(6) a.

	NONPAST.NONACTIVE.IMPERFECTIVE				NONPAST.ACTIVE.IMPERFECTIVE			
1SG	**plén-ome**	1PL	plen-**ómaste**	1SG	plén-**o**	1PL	plén-**ume**
2	**plén-ese**	2	plén-**este**	2	plén-**is**	2	plén-**ete**
3	**plén-ete**	3	plén-**onde**	3	plén-**i**	3	plén-**un**

b.

	NONPAST.NONACTIVE.PERFECTIVE				NONPAST.ACTIVE.PERFECTIVE			
1SG	**pli-θ-ó**	1PL	pli-**θ-úme**	1SG	plín-**o**	1PL	plín-**ume**
2	**pli-θ-ís**	2	pli-**θ-íte**	2	plín-**is**	2	plín-**ete**
3	**pli-θ-í**	3	pli-**θ-ún**	3	plín-**i**	3	plín-**un**

c.

	PAST.NONACTIVE.IMPERFECTIVE				PAST.ACTIVE.IMPERFECTIVE			
1SG	plen-**ómun**	1PL	plen-**ómastan**	1SG	é-plen-**a**	1PL	plén-**ame**
2	plen-**ósun**	2	plen-**ósastan**	2	é-plen-**es**	2	plén-**ate**
3	plen-**ótan**	3	plén-**ondan**	3	é-plen-**e**	3	é-plen-**an**

d.

	PAST.NONACTIVE.PERFECTIVE				PAST.ACTIVE.PERFECTIVE			
1SG	plí-**θ-ik-a**	1PL	pli-**θ-ík-ame**	1SG	é-plin-**a**	1PL	plín-**ame**
2	plí-**θ-ik-es**	2	pli-**θ-ík-ate**	2	é-plin-**es**	2	plín-**ate**
3	plí-**θ-ik-e**	3	plí-**θ-ik-an**	3	é-plin-**e**	3	é-plin-**an**

Thus, in the same manner that *-ik-* is associated with several categories and is not the marker of aspect alone, so too with the exponence of past and voice. All of the forms in (6c–d), for instance, show realizations of a feature [+past], yet there is no single identifiable "past" marker; even though, for instance, *-es* is found as the 2sg ending in three of the four past forms in (6), it is not the ending in the imperfective *plenósun:*

(7) a. éplenes 'you (SG) were washing' (past active imperfective)
b. éplines 'you (SG) washed' (past active perfective)
c. plenósun 'you (SG) were washing yourself; you were being washed' (past nonactive imperfective)
d. plíθikes 'you (SG) washed yourself; you were washed' (past nonactive perfective)

Similarly, in the paradigms in (6) nonactive ("mediopassive") voice is realized in the present tense imperfective aspect as a particular set of endings (*-ome, -ese, -ete,* etc.), which also are exponents of person, number, tense, and even aspect (since

they fail to show up in the perfective or the past); in the imperfective past, nonactive is realized with a special set of endings (*-omun, -osun, -otan,* etc.), which are themselves also exponents of person, number, tense, and even aspect. Parallel considerations hold for nonpast and past perfective forms, which admittedly have a segmentable *-θ-*; but that *-θ-* is an exponent of both nonactive voice and perfective aspect and contrasts—in other verbs—with the element *-s-* (e.g., 1sg perfective nonpast active *lí-s-o* versus perfective nonpast nonactive *li-θ-ó* from the verb *líno* 'to loosen').[5]

Thus, statements such as Rivero's claim (p. 136) that "Voice is an Affix" in a present mediopassive form such as *plénonde* 'they are being washed' clearly miss the point, for it is not at all obvious just where this affix is. Rather, the ending *-onde* represents a portmanteau realization, cumulatively expressing nonactive, present, imperfective, and 3d person plural all in one.

In a similar vein, Rivero's claim (p. 137) that "in simple tenses Aspect is an Affix" runs afoul of nonaffixal realizations of aspect. Where is the affix in perfective forms such as *pli(n)-* 'wash', where perfective aspect is signaled by a vowel change compared with the imperfective *plen-;* or *fiγ-* 'leave', where perfective aspect is signaled by a vowel change and subtraction compared with the imperfective stem *fevγ-;* or *b-* 'go in', where perfective aspect is signaled by subtraction compared with the imperfective stem *ben-;* or *p-* 'say', where perfective aspect is signaled by suppletion compared with the imperfective stem *leγ-*? Moreover, there are enough such "irregular" verbs in Greek (more than 250 in the most complete listing known to us, that of Eleftheriades 1985), many of which fall into subclasses, that to ignore them is to miss something very basic about the way aspect is realized in the language.

Therefore, the needs of an "exploded Infl" approach, requiring separate (auto-)segmental material for each maximal projection in the Infl area, including Voice and Aspect, cannot be satisfied.

One might at this point say that we are being overly stringent, and that one could achieve the right morphological effects by having verb raising attach abstract markers (e.g., NONACTIVE) to the verb stem, which later in the derivation are spelled out in the appropriate fashion to yield the right forms. Although such an approach would certainly work, it is nothing more than a morphological solution masquerading as a syntactic

[5] Rivero says (p. 136), "in a simple tense such as the Aorist/Definite [=perfective] Past . . . *θ* signals the Passive"; note also that there are aorist mediopassive forms without *-θ-*, such as *ká-ik-a* 'I was burned' and *kóp-ik-a* 'I was cut', which show that *-θ-* alone is not the marker of mediopassive even when particularized to the aorist past tense.

one; in particular, if the markers are themselves abstract and if the actual material—whether realized as distinct affixes or via portmanteau morphs—is added only later, then what guarantees that the order of morphemes as they are realized is the same as their order of abstract addition? That is, the syntax, with the rule of verb raising operating on the tree, does nothing to ensure the appropriate order of morphemes or the adjacency of Voice to the verb itself; those effects are achieved through the operation of appropriate morphological spell-out rules. Thus, in such an abstract approach it is really the morphology that achieves the desired results, not the syntax, even though one of the premises of a Pollock-style account is that morphosyntax can—and should—be treated as syntax.

Thus, Rivero's analysis in fact fails to achieve its presumed benefits. The order of morphemes in the verb is not mirrored by the order in any syntactic structure, given that in most forms in (6), because of cumulative exponence and portmanteau realizations in the endings, order is actually impossible to determine. Similarly, the adjacency of Voice to the verb that follows from her analysis is not a general fact about the Greek verb. Indeed, for forms such as *plénonde*, it is not at all clear why Voice should be said to be adjacent to the root while Aspect, or any other category for that matter, is not.[6]

Moreover, Rivero is indeed able to "assimilate" Greek to Pollock's framework, but only at the expense of misrepresenting what the various morphosyntactic markers in the Greek verb are actually marking. More significantly, she provides no syntactic justification for the exploded Infl analysis; it is clear that any motivation for the application of this framework to Greek cannot come from the morphology. The theoretically undesirable step of recourse to late spell-out rules is therefore the cost of maintaining a Pollock-style analysis of a language like Greek.

In essence, then, Rivero's analysis does not take the morphological side of the morphosyntax of the Greek verb seriously enough.

In what follows, we sketch an account of these facts that is true to the morphology of Greek. Our solution starts with the recognition that (3)–(7) show that there is no one-to-one correspondence between markers and categories; for instance, *-ik-* is associated with perfective aspect and nonactive voice and past tense, not just one category but rather a cross-cutting conglomeration of categories. What is needed, therefore, is not ref-

[6] Moreover, aspect is relevant for the shape the stem takes in forms that differ in voice (e.g., perfective *plin-/pli-* 'wash', *kale-s-* 'call' vs. imperfective *plen-*, *kal-*) and thus is realized "inside" of Voice in that sense. Indeed, several analysts, for instance Hamp (1961) and Warburton (1970), have taken Aspect to be inside of Voice and adjacent to the verb root.

erence to isolatable morphemes as exponents of single morphosyntactic features, but reference to combinations of such features expressed cumulatively.

Our analysis depends crucially on the assumption that by and large Greek morphology, both derivational and inflectional, is stem-based rather than word-based (see Anderson 1992:69–70 for some discussion). As developed in more detail in Smirniotopoulos 1990, in this view, one class of lexical rules in Greek produces stems from roots. Once created in the lexicon, these stems are then available to inflectional rules and to further derivational rules.

In the inflection of verbs in Greek, at least three different stems are relevant.[7] What we call *stem 1* (e.g., *plen-* in (6a,c)) appears in the imperfective forms of verbs, followed by members of one of four sets of person/number/tense endings (and preceded in some forms by a stem extension as well). *Stem 2* (e.g., *plin-* in (6b,d)) occurs in active perfective verb forms, followed by members of one of two sets of person/number/tense endings. *Stem 3* (e.g., *pli-* in (6b,d)) occurs in nonactive perfective verb forms, generally followed by *-θ-* (though see footnote 2), as well as *-ik-* in the past tense, and one of two sets of person/number/tense endings.

These stems may also appear in derived forms. With most verbs it is impossible to determine exactly which stem is used in derivation, because relatively few verbs show the full range of different stems and in any case the regular morphophonemics of Greek can obscure stem distinctions.[8] However, Greek has a large number of verbs with stem irregularities that make it possible to demonstrate that the same stems (boldfaced in (8)) that appear in inflected verbs also appear as the basis of various derived forms.[9]

(8) a. Stem 1: **meθ**-ó 'I get drunk', **méθ**-i 'intoxication'
févγ-o 'I leave', **fevγ**-áÍa 'flight'

[7] More may be needed. At least one verb, *maθéno* 'learn; teach', has four distinct stems: stem 1 *maθén-* (e.g., 1sg present active *maθén-o*), stem 2 *maθ-* (e.g., 1pl past active perfective *máθ-ame*), stem 3 *maθef-* (e.g., 1sg past nonactive perfective *maθéf-tika*), and stem 4 *maθi-* (e.g., nonactive perfective participle *maθi-ménos*, derived noun *maθi-tís* 'student').

[8] For example, the verb *kapnízo* 'I smoke' (1sg present active imperfective) has *kapniz-* as stem 1; its past active perfective form (1sg), *kápnis-a* 'I smoked', could show a stem 2 *kapnis-* or a stem 1 + perfective *-s-* (i.e., /kapniz-s-/). Similarly, the agentive noun *kapnistís* 'smoker' could show stem 2 (if a distinct stem) or stem 1 with $z \rightarrow s / \_\_ t$, and the action noun *kápnizma* 'smoking' could show stem 1 directly or stem 2 (if distinct) with $s \rightarrow z / \_\_ m$. Such ambiguities of analysis are the norm for the Greek verb, so that only the irregular verbs give clear evidence of distinct stems in derivation.

[9] Stem 1, the stem that appears before endings in the imperfective, only occurs in derivation (though see footnote 8) if it is also the bare

Stem 2: **méθis**-a 'I got drunk', **méθis**-i 'intoxication'
(NB: no nonactive forms, thus no stem 3)
fíγ-ame 'we left', **fiγ**-í 'flight'
(NB: no nonactive forms, thus no stem 3)

b. Stem 1: **pon**-ó 'I ache', **pón**-os 'pain'
δiδásk-o 'I teach', **δíδask**-al-ía 'instruction'
Stem 3: **poné**-θ-ik-a 'I was hurt', **pone**-tikós 'sharing sorrow of others'
δiδáx-t-ik-a 'I was taught', **δiδax**-í 'teaching(s)'

c. Stem 1: **ké**-o 'I burn'
plén-o 'I wash'
Stem 2: **káps**-ame 'we burned', **káps**-a 'heat wave', **káps**-alo 'cinder'
plín-ame 'we washed', **plin**-dírio 'washing machine'
Stem 3: **ká**-ik-a 'I was burnt', **ka**-úra 'heartburn'
plí-θ-ik-a 'I was washed', **plí**-ma 'slops, wash'

This treatment of stems, whereby they are present in the lexicon before the operation of inflectional rules, means that individual stems are available to be "invoked" by inflectional rules that refer to an unordered set of particular morphosyntactic features.[10] Owing to the phenomenon of cumulative exponence, these inflectional rules can refer to more than one category; for example, stem 2 (*plin-*) is invoked by the cooccurrence of the features [+perfective, +active]. Moreover,

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root, as with *meθ-* in (8), and no forms having the bare root plus verbalizing suffix appear in clear derived forms. Stem 1 is the basis for the imperfective verbal adjectives, the so-called participles (e.g., *plenómenos* '(while) being washed; (while) washing oneself'). These forms, even though theoretically possible for most verbs, are rarely used. Moreover, their status as derivatives is not a foregone conclusion, inasmuch as they show some verbal and some adjectival properties; accordingly, we do not use them as examples of derived forms in (8).

[10] This type of analysis would allow the features that are relevant in stem choice (voice and aspect) to be either inflectional features (as they have been treated here) or essentially derivational features, since their expression occurs within the stems necessarily available in the lexicon. In fact, there are good arguments of the usual type (productivity, semantic idiosyncrasy, etc.) to show that voice is not inflectional, but that aspect is. Rivero's analysis, in which voice precedes aspect in linear morpheme order, would also allow for this result, unlike many earlier analyses (see, e.g., Warburton 1970) that maintained that aspect preceded voice.

reference must be made to several sets of endings (recall the discussion of *-omun*, etc.) that are themselves selected as exponents of particular feature combinations; for example, [+active, −past] requires the ending set with 1sg *-o*, 2sg *-is*, and so on.

Thus, the form *plíno* 'I wash (perfective)', whose feature complex is [+active, +perfective, −past, 1st person, singular], would be generated by the following rules (where → means either 'invokes' or 'is realized by'):

(9) a. [+perfective, +active] → Stem 2 (*plin-*, from the lexicon)
b. [+perfective, −past] → Select ending set 1
c. [1st person, singular] → *-o* (from ending set 1)

Similarly, *plenósastan* 'you (all) were being washed', whose feature complex is [−active, −perfective, +past, 2d person, plural] would be generated by the following rules:

(10) a. [−perfective] → Stem 1 (*plen-*, from the lexicon)
b. [−active, −perfective, +past] → Suffix *-o-* and select ending set 4
c. (2d person, plural] → *-sastan* (from ending set 4)

Moreover, as indicated by the forms in (8), these same stems are available to be invoked by derivational rules.

Thus, this approach allows the description of inflection and derivation in Greek to be simplified considerably, for the stems in effect are generated just once, rather than potentially being created at several different steps in the formation of surface words. Moreover, this feature- and stem-based view accounts for the complexity of the exponence of morphosyntactic categories in Greek in a straightforward way by permitting both a number of features to be expressed simultaneously and a single feature to be expressed in more than one marker. Such an approach therefore has the advantage of accurately reflecting the morphological realities of Greek without the additional costly complication of an extremely abstract syntactically oriented analysis.

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