

THE MORPHOLOGY OF PAST IN GREEK

Vassilios Spyropoulos & Anthi Revithiadou
University of the Aegean

spyropoulos@rhodes.aegean.gr & revithiadou@rhodes.aegean.gr

Περίληψη

Στην εργασία αυτή εξετάζουμε τη μορφοφωνολογική ταυτότητα της παρελθοντικής αύξησης *ε-* και την κατανομή της σε σχέση με άλλες πραγματώσεις του παρελθοντικού. Υποστηρίζουμε ότι η αύξηση είναι ένα πρόθημα που αποτελείται από μοραϊκή θέση χωρίς τεμαχιακό υλικό και φέρει εγγενείς τονικές ιδιότητες, το οποίο κάτω από ειδικές φωνολογικές συνθήκες πραγματώνεται είτε ως τόνος στην προπαραλήγουσα και είτε ως τονισμένο φωνήεν *ε*. Το πρόθημα αυτό αποτελεί την ουδέτερη πραγμάτωση του χαρακτηριστικού [παρελθόν] και βρίσκεται σε σχέση αλλομορφίας με άλλες πραγματώσεις του ίδιου χαρακτηριστικού.

1. Introduction

This paper addresses the morphophonological status of the augment *e-* as an exponent of the PAST and its distribution with respect to other exponents. More specifically, we claim that the antepenultimate (APU) stress pattern in verbal forms, such as *έ-γραφ-α* ‘I was writing’ and *έ-γραψ-α* ‘I wrote’, is not itself an exponent of the PAST, as traditionally has been argued, but the surface manifestation of a segmentally empty prefix which bears lexically-encoded accentual properties (à la van Oostendorp 2007b). Furthermore, we argue that this prefix stands in an allomorphic relation with a set of other exponents of the PAST such as the affix *-ik* and a handful of suppletive verbal stems which encode tense and aspect features.

In previous analyses of Greek verb morphology (Warburton 1970; Babinotis 1972; Ralli 1988), the exact details of the division of labor between phonology and morphology in the realization of the PAST have not been worked out thoroughly. Based on the investigation of certain complexities that have been either ignored or treated in parsimony, we seek here to identify the exact function of each manifestation of the past morpheme and the proper conditioning that regulates its distribution.

2. Setting the stage

The morphology of non-imperative verb forms in Greek is characterized by the manifestation of two major grammatical categories (among others), namely *aspect* (\pm perfective) and *tense* (\pm past) (Mackridge 1985; Holton et al. 1997; Ralli 1988). Tense is mainly expressed in the ending, which also encodes subject-agreement.

(1) The non-passive endings of Greek first conjugation

	Set 1	Set 2
	-past	+past
1SG	-o	-a
2SG	-is	-es
3SG	-i	-e
1PL	-ume	-ame
2PL	-ete	-ate
3PL	-un(e)	-an(e)

The main characteristic of past forms is that they exhibit APU stress:

		[-perf, +past]	[+perf, +past]
a.	ἰδρίο ‘to establish’	1SG ἰδρία	ἰδρίσα
b.	γράφο ‘to write’	1SG ἐγγραφα	ἐγγραψα
		1PL γράφame	γράψame

In addition, monosyllabic roots develop the vowel *e*, traditionally referred to as the ‘augment’, which develops in order for APU stress to be attained. Previous analyses treat APU stress as an exponent of PAST, but they do not provide a phonological analysis for the relation between the specific stress pattern and the morphology of Greek. Moreover, they fail to account for a handful of cases, given in (3), which we take to constitute an exception of the generalized APU stress pattern. These cases employ either a special suppletive stem for the perfective past (4a), or the formative *-ik* (4b), which is otherwise used in passive perfective past forms. We conclude, therefore, that this special suppletive stem and the formative *-ik* carry out the same function as the stressed *e*- and, hence, are in complementary distribution with it.

(3) a. pérho ‘to take’ → é-pern-a [+past, -perf]
 b. béno ‘to enter’ → é-ben-a [+past, -perf]

(4) a. pír-a/*é-pir-a [+past, +perf]
 b. bík-a/*é-bik-a [+past, +perf]

Based on this observation, we propose that the augment is a segmentally empty prefix with lexically encoded stress and that *-ik* is a [+past] formative. We also suggest that tense is fused with agreement, so that they form a single terminal node in the morphological structure of the verb. The fused T-Agr node is subject to fission when it is specified as [+past], which results in multiple exponence. One exponent is the ending, which encodes tense and subject-agreement. The other exponent is the empty prefix,

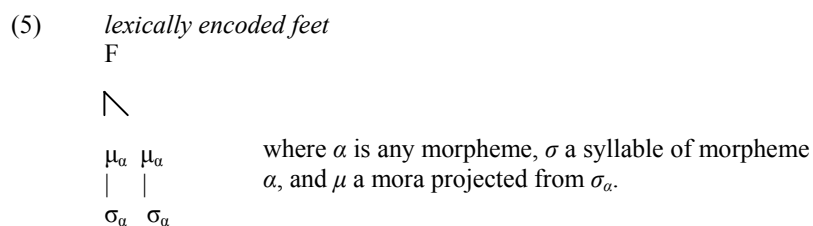
which is realized under certain conditions as a stressed front mid vowel \acute{e} . This empty prefix is the default way to encode the [+past] node, when the latter is not filled in with some other [+past] formative, such as *-ik*, or it is not satisfied by suppletion.

3. PAST as an empty prefix

This section investigates APU stress as manifestation of the PAST. We rely on van Oostendorp's (2007b) analysis of the Greek verb stress pattern, according to which APU stress is not an instantiation of the default stress in Greek but rather a manifestation of an inherent metrical structure. More specifically, we argue that the default exponent of PAST is a segmentally empty prefix with lexically-encoded accentual properties. Under certain conditions, the empty vocalic slot of the prefix materializes, e.g., *ἔγραψ-α*, giving on the surface the impression that the augment and the APU stress constitute part of a discontinuous PAST morpheme, i.e. \acute{e} - ... -a/-es/-e, etc.

3.1. Basic elements of van Oostendorp's (2007b) analysis

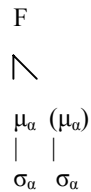
Greek stress is morphologically-governed in the sense that, first, morphemes may – although need not – have lexically-imprinted local and non-local accents (i.e. pre-/post-stressing morphemes) and, secondly, they are intimately involved in stress assignment. Furthermore, there seems to be an innate asymmetry among different types of morphemes in the way they compete for stress, in the sense that derivational affixes with lexically-imprinted stress win over roots which, in turn, supersede accents sponsored by inflectional affixes. Although APU stress typically reflects the default stress pattern for Greek (Malikouti-Drachman & Drachman 1989, among others), it may also arise from lexically-encoded metrical structure. For van Oostendorp, this structure is the trochaic foot, as shown in (5):



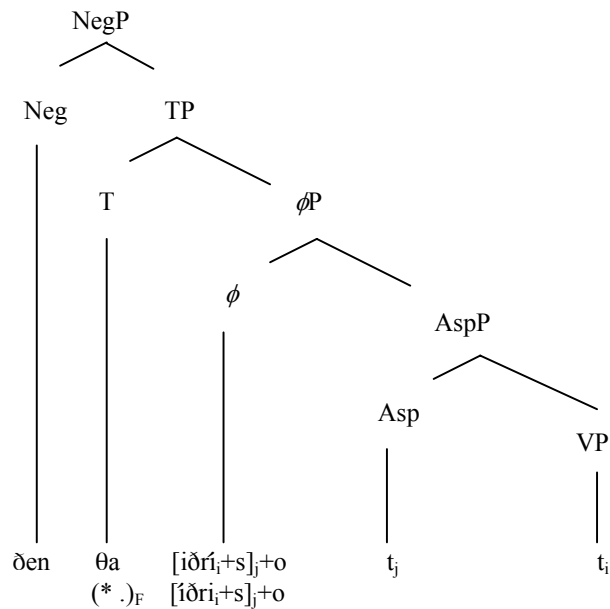
Van Oostendorp (2007b) develops an analysis for Greek past forms which is in line with the aforementioned assumptions about the morphology-phonology interaction in Greek whereas, at the same time, it also takes into account certain morphosyntactic properties of the structure in question. In particular, he proposes that the phonological exponent of

the past tense is a segmentally empty foot (6), which occurs in a functional head preceding ϕ P (=AgrP), as depicted in the tree structure in (7):

(6) *PAST as a segmentally empty underlying foot*



(7)



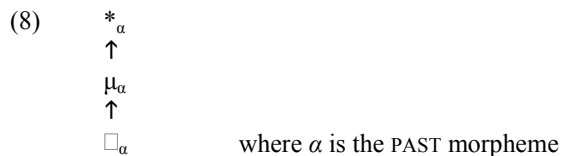
According to the proposed tree, the segmentally empty foot must be a proclitic exactly like its future tense correlate, namely the particle θa . An immediate consequence of this assumption is that tense in Greek must be realized outside the phonological boundaries of the verb. Such an analysis, however, faces two problems. Firstly, the empty prefix co-occurs with θa in forms such as $\theta a \acute{e} \gamma r a \acute{\nu} e$'s/he would be writing', which suggests that the two elements are not in complementary distribution and hence should not occupy the same position in the morphosyntactic structure. Secondly, if the past tense foot is a proclitic, then it constitutes the only instance of a clitic element which obligatorily receives primary prominence. Object clitics and other function words never claim stress

from their verbal host, regardless of whether they are accentless, as in *to káno* / **tókano* ‘I do it’, for instance, or accented, as in *às káno* / **ás kano* ‘let me do’.

Notwithstanding its shortcomings, we believe that van Oostendorp’s (2007b) analysis is essentially on the right track mainly because it is built in conformity with the basic assumptions and the overall design of the Greek stress system. Following this line of research, therefore, we propose that PAST is encoded as a segmentally empty *prefix* which sponsors an inherent *local accent*, rather than a metrical foot. Furthermore, we argue that there is a requirement for this accent to be *projected and locally pronounced*, for which reason a default vowel, traditionally known as the augment, is inserted. Only violation of the trisyllabic window may force an accent to be realized on another vocalic peak, a move that inevitably deprives the prefix of any segmental content. Our analysis employs a two-dimensional representational model, known as *Colored Turbidity* (Revithiadou 2007),¹ which draws a distinction between the lexical association and the locus of pronunciation of autosegments (i.e. accents) and, moreover, allows for the different morphological affiliation of phonological elements (indicated through indexation in the text) to be ‘visible’ in the surface structure.

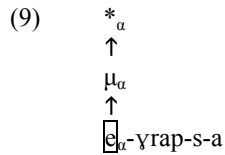
3.2. Local and non-local realizations of the PAST accent

The past tense prefix consists of a segmentally empty mora, which is lexically associated with an accent, as depicted in (8). The empty vocalic peak *projects* both a moraic position and an accent. As a result, the vocalic element inserted to fill in the empty slot, is also allotted the inherent accent of the prefix.



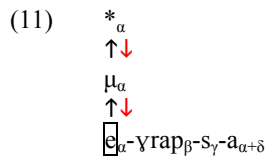
The Greek past tense data indicate that the empty prefix materializes with monosyllabic verb roots, as shown in (9), but crucially it does not with di-/polysyllabic ones, e.g. *ðjávasa* ‘I read’.

¹ CT is a combination of Goldrick’s (1998, 2000) *Turbidity Theory*, and van Oostendorp’s (2006, 2007a) *Colored Containment Theory*.



Two questions naturally arise at this point of the discussion: First, what triggers *e*-insertion and, second, why does the prefix fail to acquire vocalic content with longer bases? We argue that the constraint that triggers DEP-V violation, causing *e*-insertion (11), is RECIPROCITY, stated in (10). This constraint can be satisfied only when an accent is both projected by and pronounced on the same vocalic peak. The sole way to accomplish this is simply by filling in the empty slot with the default for Greek vowel *e*. The tableau in (12) illustrates the described system of affairs. Notice that FAITH(acc) is high-ranked in Greek (Revithiadou 1999).

(10) RECIPROCITY: If *Y* projects to *X*, then *X* must pronounce *Y* (Goldrick 2000: 3).



(12)

*	FAITH(acc)	RECIPROCITY	DEP-V
/□-γrap _β -s _γ -a _{α+δ} /			
↷ a. $\begin{array}{c} *_{\alpha} \\ \uparrow \downarrow \\ \boxed{e}_{\alpha} - \gamma \text{rap}_{\beta} - s_{\gamma} - a_{\alpha+\delta} \end{array}$			*
b. $\begin{array}{c} *_{\alpha} \\ \uparrow \rightarrow \\ \square_{\alpha} - \gamma \text{rap}_{\beta} - s_{\gamma} - a_{\alpha+\delta} \end{array}$		*!	

Although the default case is that both projection and pronunciation of an accent match, several forces may operate in a language system causing these association lines to drift apart yielding a turbid relation between an accent and its sponsor. One of the constraints that may cause a mismatch between projection and pronunciation is the 3σ-WINDOW²

² This is not a constraint *per se* but rather a cluster of constraints whose combined effects confine stress to the last three syllables of the word.

(see Revithiadou 2007 for more instances of such mismatches), which is inviolable in Standard Greek, e.g. *ðjavázume*/**ðjávazume* ‘we read’.

Based on the above, our constraint ranking is now shaped as follows: FAITH(acc), 3σ » RECIPROCITY » DEP-V. The tableau in (13) illustrates that only a non-local realization of the prefixal accent yields the optimal output.

(13)

* /□ _α -ðjava _β -s _γ -a _{α+δ} /	FAITH(acc)	3σ	RECIPROCITY	DEP-V
a. * _α ↑↓ □ _α -ðjava _β -s _γ -a _{α+δ} <i>éðjavasa</i>		*!		*
b. * _α ↑↘ □ _α -ðjava _β -s _γ -a _{α+δ} <i>ðjávasa</i>			*	
c. * _α ↑↘ □ _α -ðjava _β -s _γ -a _{α+δ} <i>eðjávasa</i>			*	*!

A welcome result of this analysis is that the APU stress in the past paradigm does not require an exceptional treatment. It can be analyzed on the basis of standard assumptions about Greek stress, especially those that pertain to the morphology-phonology interface. Only one extra assumption needs to be made: the phonological exponent of PAST is an accented empty prefix.

In the following section, we provide evidence for the prefixal status of the ‘augment’ and its development into an empty morph on the basis of data from Ancient Greek and a handful of contemporary Greek dialects.

3.3. The status of the PAST augment in Ancient Greek and the Greek dialects

The prefixal status of the augment is also witnessed in Ancient Greek (AG). As indicated by the examples in (14), *e* appears throughout the paradigm and is assigned an accent according to the dictates of the ‘three mora restriction’. The relevant representations are provided in (15). It is clear from this set of data that the prefix lacks a segmental content and is filled either with the vocalic material from the neighboring verb root (15a) or with the default vowel *e* (15b):

(14) *Ancient Greek*

	-perf +past -passive	-perf +past -passive
	a. <i>égrap^ha</i> 'I was writing'	b. <i>eélpidza</i> 'I was hoping for'
1SG	é-grap ^h -a	e-élpidz-a
1PL	é-grap ^h -amen	e-élpidz-amen

- (15) a. □-elpidz-a → [e]-élpidz-a → *eélpidza*
 ↖↑↓
 μ
- b. □-grap^h-a → [é]-grap^h-a → *égrap^ha*
 ↖↓
 μ

Contemporary Greek dialects, on the other hand, display a great deal of diversity. In Ofitica Pontic (OP), the augment *e* appears throughout the paradigm and is always stressed since OP lacks the window restriction.

(16) *Ofitika Pontic*

	+perf +past -passive
	<i>éstila</i> 'I sent'
1SG	é-stil-a
1PL	é-stil-ame

Similarly, in the Apoulia variety of Southern Italy Greek, the augment *e* is prefixed to the verb root and surfaces in all forms of the paradigm. In this dialect, however, the augment surfaces regardless of the presence of stress (17), thus contrasting sharply with the dialect of Pyli spoken in Kos (18). In the latter, the augment *e* is prefixed obligatorily to monosyllabic verb roots (18a) but only optionally – or under certain conditions pertaining to word size – to polysyllabic ones (18b). The variation between $e \sim \emptyset$ evidences the gradual loss of the vocalic content of the PAST prefix.

(17) *Apoulia* (Karanastasis 1997: 83)

	-perf +past -passive
	<i>égrafa</i> 'I was writing'
1SG	é-graf-a
1PL	e-gráf-amo

(18) *Kos (Pyli)*

	-perf +past -passive	+perf +past -passive
	a. <i>ésfiŋga</i> 'I was squeezing'	b. <i>ejírisa</i> 'I returned'
1SG	é-sfiŋ-a	e-jír-is-a
1PL	e-sfiŋ-ame	jir-ís-ame

To sum up, we proposed that APU stress in the paradigm of past is *not* the default but rather the manifestation of a segmentally empty prefix which sponsors and accent and acquires segmental content so that its accent can be locally realized. Vowel insertion is blocked when the surfacing of the (accented) vowel leads to violation of the three syllable law. We have also shown that PAST was expressed as a segmentally empty prefix in AG, filled either with vocalic material from the base or with the default vowel *e*. In several contemporary Greek dialects (e.g. Apoulia, OP), the augment *e* survives as an obligatory increment of past verb forms whereas in other dialects (e.g. Kos) it alternates with zero, depending on stress and, most likely, certain word-size conditions.

4. The derivation of past forms

Taking for granted the proposed analysis of the morphophonological status of the empty past prefix, in this section we illustrate how this empty prefix interacts with other exponents in the derivation of past forms. Our analysis adopts an *Item and Arrangement* approach to morphology, as recently developed by the framework of *Distributed Morphology* (Halle & Marantz 1993; Halle 1997). However, its spirit can be easily captured by other approaches to morphology that assume an affix-based derivation of forms.

We assume that morphology works on a set of terminal nodes which represent the relevant grammatical categories to be encoded. These terminal nodes are organized in a hierarchical structure, which derives from the organization of the relevant functional categories in the syntactic component and it is the result of the mapping of the syntactic structure onto the morphological one at the syntax-morphology interface after Spell-Out.

The terminal nodes are filled in by the formatives that carry the relevant information. This operation is subject to the *Subset Principle*:

- (19) *The Subset Principle* (Halle 1997: 128)
The phonological exponent of a Vocabulary Item is inserted into a position if the item matches all or a subset of the features specified in that position. Insertion does not take place if the Vocabulary Item contains features not present in the morpheme. Where several Vocabulary Items meet the conditions for insertion, the item matching the greatest number of features specified in the terminal morpheme must be chosen.

Insertion of the relevant formative discharges (i.e. satisfies or erases) the feature specification of the node. The feature specification of a formative may contain primary and secondary information (Carstairs 1987; Noyer 1997). By the insertion of such a formative under a terminal node, only those features of the terminal node that are primarily encoded by the formative are discharged. A terminal node may be also or additionally realized by means of a readjustment rule that affects the stem or the base to which it is affixed. Readjustment rules are lexically specified properties carried by the root/stem and imposed on the relevant terminal node.³

The terminal nodes are subject to operations of the Morphological Structure (MS), such as *impoverishment*, *fusion* and *fission* (Halle & Marantz 1993; Halle 1997). Fission, which is of relevance here, is an operation that allows for a terminal node to have multiple exponents. Under normal circumstances, a terminal node is expressed only once, no matter whether the formative inserted under it expresses only a subset of its features. When fission applies, other formatives may be also inserted under such a terminal node, until all of its features have been discharged.

4.1. The morphological structure of Greek verbs

The morphological structure of Greek verbs derives from the hierarchical organization of the functional categories involved in the clause structure. Given that mood is only relevant for imperative verb forms, the non-imperative verb forms we are dealing in this paper have the following morphological structure (Philippaki-Warbuton 1998; Rivero 1990; Philippaki-Warbuton & Spyropoulos 1999; Galani 2005):⁴

- (20) verb root-VOICE-ASPECT-TENSE-AGREEMENT

³ The existence and function of readjustment rules is related to suppletion.

⁴ See also Warbuton (1970, 1973) from the viewpoint of morphology. Cf. Joseph & Smirniotopoulos (1993) and Ralli (1999, 2005) for arguments against an Item-and-Arrangement approach to Greek verb morphology.

There is ample evidence that agreement does not exist as an independent functional projection in Greek clause structure, and that agreement features are parasitic to the functional category of Tense (Spyropoulos 1999). This means that Tense and Agreement form a fused terminal node in MS:

(21) verb root-VOICE-ASPECT-[TENSE-AGREEMENT]

In this paper we further propose that the fused T-Agr terminal node is subject to fission, when it is specified as [+past].

4.2. The derivation of the active past forms

In past forms, the fused T-Agr terminal node is specified as [+past, α agreement⁵]. There are two exponents of [+past], namely the empty prefix described in section 3 and the relevant Set 2 ending. The empty prefix is specified as [+past] only. The Set 2 ending is primarily specified for agreement and secondarily as [+past].

(22) *The feature specification of past tense formatives*

□- \Leftrightarrow [+past]

Set 2 ending \Leftrightarrow [α agreement, (+past)⁶]

Insertion of a Set 2 ending discharges the agreement specification, but crucially not that of [+past]. Since the T-Agr node is marked for fission, the empty prefix is employed in order to discharge this specification, yielding the by now well-known APU stress pattern.

4.3. The derivation of [+passive, +perf, +past] forms

These forms involve the insertion of a formative *-θik* and take the Set 2 endings which carry no specification for voice. It may be argued that *-θik* is a formative specified as [+passive, +perf] which satisfies the relevant specifications of the aspect and voice terminal nodes (Babiniotis 1972; Ralli 2005). Past tense is then realized in the same way as in active forms described above, i.e. the fused T-Agr node is marked for fission and it is realized by the insertion of Set 2 endings and the empty prefix. However this analysis cannot be maintained, mainly because *-θik* is not a single formative specified as [+passive, +perf]. This is evident by the fact that *-θik* does not appear in [+passive, +perf, -past] forms. Crucially, in these forms only the *-θ* part appears, as shown in (23):

⁵ Since we are not interested in agreement and the features it involves, we will use a general specification [α agreement] where relevant.

⁶ Secondary specification is denoted by being included in brackets.

(23) iðríó ‘to establish’ → iðrí- θ ik-a [+perf, +past] ~ iðri- θ -ó [+perf, -past]

In addition, *-ik* appears alone in [+passive, +perf, +past] forms in which the [+passive, +perf] specification has been satisfied by means of a readjustment rule that has affected the stem resulting in suppletion. Thus, the verb *stréfo* ‘to twist’ has a special stem *stráf-* which is used only in [+passive, +perf] forms:

(24)

Voice	Aspect	Tense	
		+past	-past
active	+perf	é-strep-s-a	strép-s-o
	-perf	é-stref-a	stréf-o
passive	+perf	stráf-ik-a	straf-ó
	-perf	stref-ómuna	stréf-ome

Furthermore, *-ik* also appears in the [-passive, +perf, +past] forms of three verbs, namely *b-ík-a* (*béno* ‘to enter’), *v γ -ík-a* (*v γ éno* ‘to exit’), *vr-ík-a* (*vrísko* ‘to find’). Significantly, these forms do not respect the APU stress pattern and, as anticipated under the current analysis, are not augmented either. Notice also that *-ik* does not appear in the corresponding [-passive, +perf, -past] forms, namely *b-ó*, *v γ -ó* and *vr-ó*.

The combined examination of these facts shows that *- θ ik* consists of two formatives, namely *- θ* and *-ik*. *- θ* encodes passive voice and perfective aspect as evident from the fact that it appears only in [+passive, +perf] forms and it is in complementary distribution with readjustment rules/suppletion triggered by these specifications. On the other hand, *-ik* is a past tense exponent selected by perfective aspect, as shown by the fact that it appears only in perfective forms that are specified as [+past] and it appears in both active and passive perfective past forms.⁷ We claim that *- θ* and *-ik* are separate formatives specified as [+passive, (+perf)] and [+past, (+perf)], respectively. The formative *-ik* is therefore in competition with the empty prefix. Since the latter is only specified for [+past], insertion of *-ik* always wins over in perfective forms, in which the perfective specification of the aspect node has not been discharged.

The [+passive, +perf, +past] forms are therefore derived as follows: Insertion of *- θ* satisfies the voice and aspect terminal nodes, but crucially it does not discharge the

⁷ The previous analyses that separate *- θ ik* into *- θ* and *-ik* do not treat *-ik* as a past tense exponent but rather as either a perfective or a passive perfective exponent (Hamp 1961; Koutsoudas 1962; Babiniotis 1972; Warburton 1973; Rivero 1990), with the exception of Galani (2005) who suggests that *-ik* is primarily specified for [+passive, +perf] and secondarily as [+past].

[+perf] specification, since this feature is secondarily expressed by this formative. In the fused T-Agr node, fission applies and insertion of the Set 2 ending satisfies the agreement features but not the [+past] specification. Two formatives compete for insertion under the [+past] node:

- (25) □- ⇔ [+past]
 -ik ⇔ [+past (+perf)]

-ik wins over because it is more specified, given the [+perf] specification of the aspect node.⁸ The APU stress pattern exhibited in these forms derives from default stress.

4.4. The derivation of irregular [-passive, +perf, +past] forms

The derivation of these forms falls under two different cases, namely (a) verb forms that involve the formative -ik and (b) verb forms that involve suppletion, e.g. *píra* (*pérno* ‘to take’), *píya* (*piyéno* ‘to go’). The first case is attested with only three verbs, i.e. *b-ík-a* (*béno* ‘to enter’), *vγ-ík-a* (*vγéno* ‘to exit’) and *vr-ík-a* (*vrísko* ‘to find’). These three verbs involve different stems for perfective and imperfective forms (26).

- (26) a. b- [+perf] ~ bén- [-perf]
 b. vγ- [+perf] ~ vγén- [-perf]
 c. vr- [+perf] ~ vrísk- [-perf]

In this respect, they are similar to a class of verbs that make no use of the [+perf] formative -s and satisfy the [+perf] specification of the aspect node by means of (a) insertion of the default null formative or (b) readjustment rules/suppletion or (c) both. However, the three verbs in question differ from these verbs in that the perfective specification of the aspect node is somehow not discharged and is able to condition the insertion of the past formative.⁹ -ik is therefore inserted instead of the empty prefix

⁸ The exact way in which the [+perf] specification of the aspect terminal node affects the T-Agr node is not very clear. It may be taken to indicate that these forms involve generalized fusion so that the perfective aspect may condition the insertion of the -ik formative, because it belongs to the same node with tense. We leave the issue open to further research.

⁹ One possible way to formulate this asymmetry is to assume that inward-sensitive grammatically conditioned allomorphy involves fusion of the relevant nodes. Thus, in the forms where the perfective aspect node conditions the insertion of the past formative fusion between the aspect and the T-Agr node has taken place. See note 8.

because of its [+perf] specification. The absence of the empty prefix explains why these forms do not exhibit the APU stress pattern and cannot take the augment.

The second case involves verbs that have two different stems for the perfective forms, one for [+past] and another for [-past]:

(27) *pérno* ‘to take’ → *pír-a* [+perf, +past] ~ *pár-o* [+perf, -past]

Suppletion in these forms is relevant not only to perfective aspect, but also to past tense. This means that the [+past] specification of the tense node is satisfied by a special readjustment rule, together with the [+perf] specification of the aspect node. Readjustment rules are lexically determined and thus block the insertion of either *-ik* or the empty prefix. As a consequence, these forms display neither the *-ik* formative nor the APU stress pattern and of course they do not take the augment. The only formative inserted under the T-Agr node is the Set 2 ending that realizes primarily the agreement features and secondarily the [+past] specification.

5. Conclusions

In this paper we showed that the APU stress pattern is not a morphological exponent of PAST, but rather derives from a segmentally empty prefix with lexically-encoded stress properties. We have also presented evidence that the formative *-thik* is not a single formative and that it includes an *-ik* formative which is a past tense exponent with a secondary perfective aspect specification.

Based on these observations, we proposed an analysis for the derivation of past forms based on the assumption that the fused T-Agr terminal node is subject to fission, which results in multiple exponence. The empty prefix and the *-ik* formative compete for insertion under the [+past] node with *-ik* winning over when the [+perf] specification of the aspect node has not been discharged. Significantly, insertion of the empty prefix and *-ik* is blocked when the relevant node has been satisfied by a lexically defined readjustment rule.

The proposed analysis has a number of benefits. First, it reveals the nature and the conditions underlying the distribution of the APU stress pattern and the augment. Second, it explains the APU stress pattern and the augment by means of independently needed assumptions regarding the phonological manifestation of the morphological structure. Last, but not least, it accounts for the ‘irregular’ instances of past tense manifestation by means of a unified analysis with the regular ones.

References

- Babiniotis, G. 1972. *The Greek Verb [Το Ρήμα της Ελληνικής]*. Athens.
Carstairs, A. 1987. *Allomorphy in Inflection*. London, Croom Helm.

- Galani, A. 2005. *The Morphosyntax of Verbs in Modern Greek*. Ph.D Thesis, University of York.
- Goldrick, M. A. 1998. "Optimal opacity: Covert structure in phonology". Ms., John Hopkins University.
- Goldrick, M. A. 2000. "Turbid output representations and the unity of opacity". In M. Hirotani, A. Coetzee, N. Hall & J.-Y. Kim (eds.), *Proceedings of NELS 30*. Amherst, Massachusetts, GLSA, University of Massachusetts, 231-245.
- Halle, M. 1997. "Distributed Morphology: Impoverishment and fission". *MIT Working Papers in Linguistics* 30, 425-449.
- Halle, M. & Marantz A. 1993. "Distributed Morphology and the pieces of inflection". In K. Hale & S. J. Keyser (eds.), *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*. Cambridge MA, MIT Press, 111-176.
- Hamp, E. 1961. "The verb in the contemporary spoken Greek language (Το ρήμα εν τη σημερινή ομιλουμένη ελληνική γλώσση)". *Athena [Αθηνά]* 65, 101-128.
- Holton, D., Mackridge, P. & Philippaki-Warbuton, I. 1997. *Greek: A Comprehensive Grammar of the Modern Language*. London: Routledge.
- Joseph, B. & Smirniotopoulos J. 1993. "The morphosyntax of Greek verb as morphology and not syntax". *Linguistic Inquiry* 24, 388-398.
- Karanastasis, A. 1997. *Grammar of the Greek dialects of Southern Italy [Γραμματική των Ελληνικών ιδιωμάτων της Κάτω Ιταλίας]*. Athens, Athens Academy.
- Koutsoudas, A. 1962. *Verb Morphology of Modern Greek*. The Hague: Mouton & Co.
- Mackridge, P. 1985. *The Modern Greek Language*. Oxford: Oxford University Press.
- Malikouti-Drachman, A. & Drachman, G. 1989. "Stress in Greek [Τονισμός στα Ελληνικά]". *Studies in Greek Linguistics 1989*, 127-143.
- Noyer, R. 1997. *Features, Positions and Affixes in Autonomous Morphological Structure*. New York, Garland.
- Oostendorp, M., van. 2006. "The theory of faithfulness". Ms., Meertens Institute/KNAW.
- Oostendorp, M., van. 2007a. "Derived environment effects and consistency of exponence In S. Blaho, P. Bye & M. Krämer (eds.), *Freedom of Analysis?*, Berlin, Mouton de Gruyter, 123-148.
- Oostendorp, M., van. 2007b. "Stress as a proclitic in Modern Greek". Ms., Meertens Institute/KNAW.
- Philippaki-Warbuton, I. 1998. "Functional categories and Modern Greek syntax". *The Linguistic Review* 15, 158-186.
- Philippaki-Warbuton, I. & Spyropoulos, V. 1999. "On the boundaries of inflection and syntax: Greek pronominal clitics and particles." In G. Booij & J. van Marle (eds.), *The Yearbook of Morphology 1998*. Dordrecht, Kluwer, 45-72.
- Ralli, A. 1988. *Eléments de la Morphologie du Grec Moderne: La Structure de la Verbe*. Ph.D. Thesis, University of Montreal.

- Ralli, A. 1999. "Inflectional features and the Morphological Module hypothesis". In *Working Papers in Theoretical and Applied Linguistics* 6. Thessaloniki, English Department, Aristotle University, 111-142.
- Ralli, A. 2005. *Morphology* [Μορφολογία]. Athens, Patakis.
- Revithiadou, A. 1999. *Headmost Accent Wins: Head Dominance and Ideal Prosodic Form in Lexical Accent Systems*. Ph.D. Thesis, LOT Dissertation Series 15 (HIL/Leiden University). The Hague, HAG.
- Revithiadou, A. 2007. "Colored Turbid accents and Containment: A case study from lexical stress". In S. Blaho, P. Bye & M. Krämer (eds.), *Freedom of Analysis?*, Berlin, Mouton de Gruyter, 149-174.
- Rivero, M.-L. 1990. "The location of non active voice in Albanian and Modern Greek". *Linguistic Inquiry* 21, 135-146.
- Spyropoulos, V. 1999. *Agreement Relations in Greek*. Ph.D. Thesis, University of Reading.
- Warburton, I. 1970. *On the Verb of Modern Greek*. The Hague, Mouton & Co.
- Warburton, I. 1973. "Modern Greek verb conjugation: Inflectional morphology in a Transformational Grammar". *Lingua* 32, 193-226.

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