

Distributed Morphology and vocabulary organisation

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The purpose of this paper is to investigate the status and the organisation of the vocabulary in Distributed Morphology (DM) (Halle and Marantz 1993). Based on evidence drawn from the verbal forms in Modern Greek I claim that the vocabulary has an independent structure where word formation processes may occur, and it is the repository not only of syntactic and phonological but also morphological features. As far as the organisation of the vocabulary entries is concerned, I propose that they are organised in tree hierarchies based on the degree of markedness of theme vowels – and not blocks organised in terms of specificity as in the standard DM approach. Finally, this view of the vocabulary has important consequences for word formation and the treatment of allomorphy.

1. Introduction

In this paper I discuss the status of the vocabulary in Distributed Morphology (DM) (Halle & Marantz 1993). I revisit the standard view in DM, which strictly sees the vocabulary as the repository of syntactic features onto phonological ones of underspecified entries. The proposal put forward considers the vocabulary as a component where morphological features are further incorporated in the Vocabulary Items (VIs). Crucial to this alternative view is the claim that the vocabulary is governed by its principles and has an independent structure. It is also seen as the component of grammar that actively participates in word formation by the application of operations affecting the formation of suppletive stems. Nevertheless, it should be noted that even though its function is now extended, it is still less complicated and more restricted than the lexicon in other theories (Di Sciullo & Williams 1987, Lieber 1992, Aronoff 1994). Additionally, the incorporation of morphological features in the vocabulary dictates the application of a feature checking order mechanism.

Moreover, the discussion of the empirical data, drawn from the verbal forms in Modern Greek (MG), also sheds light on the organisation of the VIs. It is argued that VIs are organised in tree structures, *contra* the standard view in

DM; VIs are organised in blocks in terms of specificity. As this position no longer holds, it is claimed that the organisation of the tree structures is dependent upon a hierarchy based on the degree of markedness (Ultra-Massuet 1999) of certain VIs. The view regarding the tree structures renders certain similarities with the organisation of the lexemes in Head driven-Phrase-Structure-Grammar (HPSG) (Koenig 1999). Nevertheless, no processes operate within the branches. On the other hand, an ultimate advantage of the hierarchical organisation of the VIs is that it allows one to interrelate items to one another to a certain extent.

As is shown in what follows, this analysis makes intriguing predictions about the degree of frequency, regularity and diachrony of the morphological units that participate in the formation of the verbal forms in MG. From a wider theoretical perspective, it also has significant consequences not only for the purposes of word formation but also as far as an alternative treatment of allomorphy is concerned.

However, the application of the new theory is restricted to the verbal forms in MG due to space limitations. The interested reader is referred to Galani (in preparation) for a discussion around nominative forms in MG. Its application, though, to other languages is subject to further and thorough investigation.

The rest of this paper is organised as follows: in section 2, I present the data drawn from MG. In the following section, I summarise the key features of the vocabulary in DM, before presenting the problems such theory faces for the given analysis of the data. In section 4, the alternative view of the DM vocabulary is unfolded. Its consequences are briefly highlighted in section 5, whereas the paper concludes with an overview of the main points that have been raised, in section 6.

2. Data

In this section, I pay attention to the facts any treatment of the verbal forms in MG should account for. The following points are based on claims made in Galani (2002) and subsequent work to which the interested reader is referred for extensive discussion.¹ I will first start off by discussing the morphological units of which verbal forms in MG consist as well as the features these units represent. Attention will be paid to the theme vowels (TVs), not only as far as their morphosyntactic content is concerned, but also in relation to the position in which they appear within the forms. Finally, the discussion in this section will be rounded off by looking at suppletive verbal stems. The way the analysis is presented in what follows, it remains theory neutral.

It has been argued that verbal forms consist of the root followed by the morpheme representing not only the aspectual but also morphological features

¹ Galani (2002a-b, 2003a-c, to appear a-b).

- (3) (a) gd - ár - thik - e
 $\sqrt{\text{.skin[+}\alpha, -\beta]} - \text{PER[+}\alpha, -\beta] - \text{NAps.per[+}\alpha, -\beta] - 3\text{SG.PS}$
 ‘He/she/it was skinned.’
- (b) agap - í - thik - e
 $\sqrt{\text{.love[+}\alpha, -\beta, +\gamma]} - \text{PER[+}\alpha, -\beta, +\gamma] - \text{NAps.per[+}\alpha, -\beta, +\gamma] - 3\text{SG.PS}$
 ‘He/she/it was loved.’

This mapping ensures that the correct morphological pieces are matched to the correct stems. This is important in cases where the morphological spell-out of voice differs for stems belonging to different classes. This pattern is exemplified in (4).

- (4) (a) gd - ern - ó - mun
 $\sqrt{\text{.skin[+}\alpha, -\beta]} - \text{IMP[+}\alpha, -\beta] - \text{NAimp[+}\alpha, -\beta] - 1\text{SG.PS}$
 ‘I was being skinned.’
- (b) agap - \emptyset - ió - mun
 $\sqrt{\text{.love[+}\alpha, -\beta, +\gamma]} - \text{IMP[+}\alpha, -\beta, +\gamma] - \text{NAimp[+}\alpha, -\beta, +\gamma] - 1\text{SG.PRES.na}$
 ‘I was being loved.’

Ungrammaticality, for instance, results if *-ern-* (4a) is matched to *-ió-* (4b). The only way to ensure that the correct combinations occur, is achieved, is through the matching of the morphological features (class) TVs represent.

What has to be made explicit about these morphological units is that they represent syntactico-semantic (aspect, tense, voice, agreement), morphological features and they also have a phonological content, overt or covert. All of these features should be included in the storage unit of the grammar of any given theory.

Moreover, the formation of such forms based on non-suppletive stems –as the ones exemplified in (1) and (3-4)- seems to follow a regular and productive pattern of formation. Consider the formation of nominal forms.

- (5) (a) gd - ár - simo
 $\sqrt{\text{.skin[+}\alpha, -\beta]} - \text{TV[+}\alpha, -\beta] - \text{NOM.SG.NEUT}$
 ‘Skinning.’
- (b) agáp - \emptyset - i
 $\sqrt{\text{.love[+}\alpha, -\beta, +\gamma]} - \text{TV[+}\alpha, -\beta, +\gamma] - \text{NOM.SG.FEM}$
 ‘Love.’

The root is matched to the TV –which also serves as a class marker– followed by the nominal suffixes.³ Consequently, the TV is a marker of class independently of whether this is declensional or conjugational. This is determined by the external environment of the stem (voice versus case and gender agreement).

³ Whether aspect is represented in the nominals is not discussed in this paper. The reader is referred to Galani (to appear, a), instead.

This shows that the formation is based on fairly productive morphological processes –joining each unit with the rest in line with the morphological features and syntactico-semantic content matching- and not on non-productive rules stored in the lexicon, as Joseph & Smirniotopoulos (1993) claim. Nonetheless, it should be noted that certain similarities hold between the two accounts as far as the ordering of the pieces of morphology are concerned; in both cases verbal forms in MG consist of the stem –representing aspect- followed by the morphemes representing voice, and the ones agreement and tense. The major difference between the two theories is that the latter account lacks an analysis of the TVs and, consequently, the features represented in them and the functions attributed to them. On the other hand, the account sketched here also differs from a purely syntactic analysis of the verbal morphology in MG based on claims made in Rivero (1990) who sees the formation of verbs in MG as the result of the operation of head-movement.⁴

Let us now turn to suppletive stems in MG. It is proposed that the formation of suppletive stems is a fairly unproductive process seen as the result of the application of rules operating in what seems to be the lexicon or the vocabulary in DM terms. This necessarily means that the morphological component does not have the mechanisms to account for their formation, as was the case in non-suppletive environments. So, the proposal put forward here is that morpho-lexical rules are stored in the lexicon/vocabulary. A key feature of these rules is also the morphological features of class. The presence of a specific morphological feature in the root signals the application of such rules in order for the stem to be formed. The stem, which is further manipulated in the syntax, morphology and/or phonology, enters these components formed, directly from the lexicon/vocabulary. Consider the following example, (6).

- (6) (a) *lég* – *ete*
 $\sqrt{\text{say}}[\text{stem.IMP}] [-\delta] - 3\text{SG.PRES.na}$
 ‘He is said.’
- (b) *ip* – *óthik* – *e*
 $\sqrt{\text{say}}[\text{stem.PER}] [-\delta] - \text{NA.ps.per} - 3\text{SG.PS}$
 ‘It was said.’

When the system comes across the morphological feature [- δ] in a given root environment, the application of a rule stored in the lexicon should be activated. Descriptively, this rule says: “apply rule X to root Y, when stem Z – subject to syntactic features- needs to be formed”. In the case of the formation of the imperfective stem of the root *leg-* ‘say’, the application of the morpho-lexical rule will give *leg-* as in (6a), whereas for the formation of the perfective one, it will give *ip-*, as appears in (6b). Here, it should be noted that such forms bear a strong diachronic relation to the ones available in previous stages of the language. Due to the high degree of irregularity and use, they retained their forms until the present stage.

⁴ The discussion is omitted from the present paper. See Galani (2002a).

To conclude, the facts around the verbal morphology in MG have been presented in this section. Section 3 discusses the standard DM principles.

3. *Vocabulary in Distributed Morphology and problems*

The aims of this section are to highlight the DM principles, especially in relation to the status of the vocabulary and the organisation of the vocabulary entries, before considering some of the key problems and questioning the validity of these proposals for the formulation of the above account of the verbal morphology in MG within this framework.

3.1. *Vocabulary: DM principles*

DM is a post-syntactic framework developed by Halle & Marantz (1993). A significant aspect of this framework is the way syntactic terminal nodes are seen. Syntactic terminal nodes are complexes of syntactic and semantic features that are called morphemes. These morphemes lack any phonological specification. Head-movement applies at the syntactic component. Once the syntactic operations are complete, the structure enters the morphological component. Morphological processes may further modify the structure mainly before Vocabulary Insertion. Fusion, for instance, is the morphological operation by which two terminal nodes are fused into a single one. Only one VI, the specification of which matches the specification of the fused node, can compete for insertion in this node.

Moreover, Vocabulary Insertion is the operation that supplies the terminal nodes with phonological features. It should be noted that Vocabulary Insertion is subject to the Subset Principle (Halle 1997); the most highly specified item for the features of the given terminal node wins the competition between the VIs.

DM assumes that there is no lexicon, *contra* other theories, such as Lieber (1992). Its function is now distributed across the syntactic, morphological and phonological components. The storage unit of the VIs is the vocabulary which serves as the repository of the mapping of syntactico-semantic features onto phonological ones of underspecified entries. No operations apply here. Any readjustment rules apply at the morphological component. So, the vocabulary does not participate actively in the process of word formation.

Finally, as far as the organisation of the VIs is concerned, DM assumes that the Subset Principle also serves as the ordering mechanism of these entries. The most specified entry will precede less specified ones. VIs are grouped in blocks, although the exact ways by which this grouping is achieved are not particularly clear. The inadequacies such view raises for the analysis of the MG verbal forms are discussed in what follows.

3.2. Vocabulary: DM problems for Modern Greek

I would now like to turn to the problems the principles of DM face as far as the analysis of the data presented in section 2 is concerned. Let me first start off by making reference to the features VIs carry in the vocabulary.

It is not explicitly stated that morphological features may be also stored in the repository of the grammar. As the theory stands at present, the mapping of syntactico-semantic to phonological features clearly excludes the presence of any morphological ones. This obviously creates an obstacle for the analysis of the verbal morphology in MG; the morphological features of class carried in all the pieces of morphology participating in verb formation are not accounted for. This has important consequences for ensuring that only the correct pieces are matched to one another so that grammatical forms are derived, as well as for retaining the assumption that the grammar has the mechanisms to derive non-suppletive versus suppletive stems under distinct processes.

As was suggested in section 2, the formation of suppletive stems cannot be seen as the result of productive processes, where the root is matched to the TV followed by the morpheme representing the features of voice and the one representing agreement and tense. On the contrary, the system does not have the mechanisms to interpret diachronic information in such a regular and productive way. There is no way to derive suppletive stems in the syntactic, the morphological and/or the phonological components. The formation of suppletive stems can be only seen as information passed on in the grammar.

On the other hand, the possibility of the application of morpho-lexical rules in the morphological component is also not desirable, and is consequently abandoned. Suppose that the system in the morphological component comes across the morphological feature that denotes a suppletive pattern. The first question relates to how the system knows that this is so. There are two ways: either this information is incorporated in the morphological component and, consequently, the tree structures are altered in order to create the appropriate environment for the insertion of the VI which matches the specification of the nodes, or, alternatively, morphology looks into the vocabulary prior to insertion and then morphological processes further apply. Nevertheless, if morpho-lexical rules can be only interpreted in the morphological component, the system would be required to look into the vocabulary, select the items that match the specification of the nodes and then alter them once vocabulary insertion has occurred. Bearing in mind economy considerations, this option is not particularly appealing.

Moreover, there is also the question as to where these rules are stored. Is it the morphology or the vocabulary? How does the system know where to look? If the morpho-lexical rules are stored in the vocabulary, this necessarily means that it is not only a repository of mapping of features. On the contrary, if it is the morphological component, it means that a relation must hold and relate the rules that are stored in the morphology to the items stored in the vocabulary. Again, taking into account the economy of this proposal, it appears not to be

explicitly motivated, as it makes sense to store both the rules and the items they refer to together.

The next issue regarding the vocabulary in DM relates to the ways VIs are organised. Based on the Subset Principle, it is claimed that the most specified entry precedes less specified ones. Consider example (1), repeated here as (7).

- (9) (a) gd - ár - thik - e
 √.skin[+α, -β] - PER[+α, -β]- NAPS.per- 3SG.PS
 ‘He/she/it was skined.’
- (b) agap - í - thik - e
 √.love[+α, -β, +γ] - PER[+α, -β, +γ]- NAPS.per - 3SG.PS
 ‘He/she/it was loved.’

In line with the principle, one predicts that the TV that appears in forms such as (7b) should precede the one in (7a), as it is more specified. Nevertheless, recall what has been said about the degree of frequency, regularity, and diachrony of the morphological pieces participating in the formation of the verbal forms in MG. Adopting the Subset Principle, one is led to predict that the items appearing in (7b) are more frequent, regular and diachronically neuter than the ones in (7a). Nonetheless, this does not mirror the real picture. As Koutsoudas (1964) also suggests, forms such as the one in (7b) are less frequent, more irregular and bear a stronger diachronic relation to the equivalent forms in previous stages of the language.

Moreover, the organisation of the vocabulary entries in blocks does not capture the degree of relation between the items. There is also the question of how the items are organised in blocks. Is the organisation made in terms of the syntactico-semantic features or, in this case, the morphological ones? Based on what has been sketched in the literature, the syntactico-semantic features are used as the mechanism for organising the items in blocks.

Finally, this view has further consequences for economy considerations. Consider the process of vocabulary insertion; the system would have to look into different blocks to pick out the items that match the specification of the nodes. On the other hand, if all the items bearing the same morphological feature were arranged all together in a way, the system would have to look at a specific ‘chunk’ to choose the item which wins the competition and not throughout the vocabulary. Nonetheless, this cannot be maintained, if one still assumes that blocks are the best way to organise the entries. An alternative way is explored in section 4.

4. Vocabulary: an alternative view

In this section, I present an extended version of the status of the vocabulary in DM and explore an alternative method as far as the organisation of the vocabulary entries is concerned.

- (10) 1. (a) $\gamma \rightarrow \emptyset / [+V] V \#$
 where +V = [verb] and V = vowel
 (b) $\gamma + V \rightarrow \emptyset / [+V] V$
 but [V + PAST, +NON-ACTIVE] \rightarrow [Rule 9]
 2. $\sqrt{leg-} + [+perfective, (+past)] \rightarrow V[ip-]$

(10a) will produce the stem appearing in (9a), whereas (10b) the one in (9b). Here, it should be made clear that the formation of such stems occurs only once and they are then available forms to compete for vocabulary insertion. In addition, an important difference between this view and other theories in the literature is that suppletive stems are formed in the vocabulary. Their formation is the result of the interpretation of syntactico-semantic and morphological information. It is not the result of abstract readjustment rules which say: ‘take stem X and change it to Z’, without defining the exact conditions under which the suppletion occurs. An alternative analysis is offered by Joseph & Smirniotopoulos (1993) who suggest that such stems are stored in the lexicon, they are not formed or derived under any rules.

Moreover, the proposal that rules are stored in the vocabulary is further supported, if we consider cases such as the rule which conditions the insertion of the augment –the morpheme inserted in some verbal forms to occupy the stress in the past tenses, see Galani (2002c) for an extensive discussion- or the one under which the suffixation of certain nominal morphemes is constrained.⁶

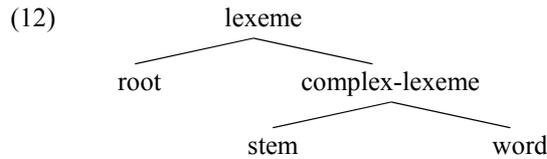
- (11) (a) \acute{e} - grapsa
 AUG - $\sqrt{\text{write}}$.PER.AC.1SG.PS
 ‘I wrote.’
 (b) $\acute{p}\acute{e}\tau\text{r}$ - ino
 $\sqrt{\text{stone}}$ - NOM.nom.sg.neut
 ‘Of stone.’
 (c) molivé- nio
 $\sqrt{\text{lead}}$ - NOM.nom.sg.neut
 ‘Leaden.’

Descriptively, the augment is inserted when the features of [+past] are represented, and only if the number of syllables is less than three in the past tenses, where the stress moves to the antepenultimate. On the other hand and in the nominal environment, the suffixation of *-ino* (11b) occurs when the number of syllables of the stem is less than three, whereas in the cases where the stem is phonologically heavy the suffix *-nio* (11c) wins the competition. Such rules, though, are only phonologically interpreted and they are available once the structure enters PF.

Now, let us turn to the last issue of this alternative view, which looks in to the organisation of the vocabulary entries.

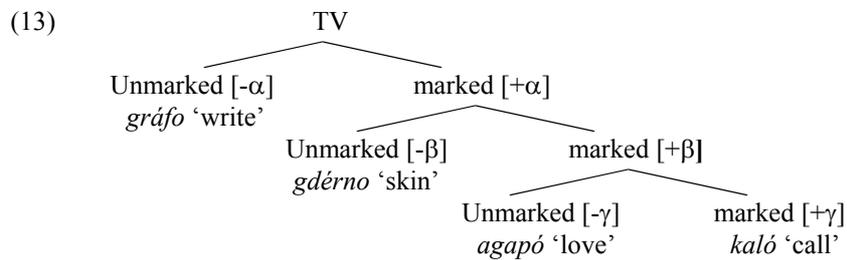
⁶ Special thanks to Gaberell Drachman for bringing it to my attention. (11b-c) are adapted from Drachman, Kager & Malikouti-Drachman (1995).

I propose that VIs are hierarchically organised in tree structures rendering similarities with the hierarchical structure of the syntactic, morphological and phonological components. Additionally, the tree structuring is also similar to the organisation of the lexemes in Koenig (1999) constructional morphology within the framework of HPSG.



A significant difference between the two theories, though, relates to the fact that no processes operate within the branches in DM, *contra* HPSG where the ways branches are organised leads to the formation of a lexeme and consequently a grammatical form.

Moreover, what remains to be seen is the ways by which VIs are arranged in the tree structure. I propose that the structure can be seen in terms of a hierarchy based on the degree of markedness –the notion is adapted from Oltra-Massuet (1999)- of the TVs. VIs that are less specified belong to the higher nodes of the tree, whereas the more deeply embedded an item is, the more specified it is. This is illustrated in the following structure, (13).



The way VIs are organised in (13) also denotes the degree of regularity, frequency and diachrony, reported in Koutsoudas (1964). The more deeply embedded an item is, the more irregular and less frequent it is. So, the items corresponding to suppletive stems are, in principle, the most deeply embedded ones.

Furthermore, the notion of level of embedding also enables us to account for the interrelation between the entries. It is predicted that forms will retain certain similarities as far as the morphological spell-out of some pieces may be concerned. Recall examples (1) and (4), repeated here as (14-15) respectively.

- (14) (a) gd - ár - thik - e
 √.skin[+α, -β] - PER[+α, -β]- Naps.per - 3SG.PS
 'It was skinned.'

- (b) agap - í - thik - e
 $\sqrt{\text{love}}[+\alpha, -\beta, +\gamma]$ - PER[$+\alpha, -\beta, +\gamma$] - N_{Aps.per} - 3SG.PS
 ‘She was loved.’
- (15) (a) gd - ern - ó - mun
 $\sqrt{\text{skin}}[+\alpha, -\beta]$ - IMP[$+\alpha, -\beta$] - N_{Aimp}[$+\alpha, -\beta$] - 1SG.PS
 ‘I was being skinned.’
- (b) agap - Ø - ió - mun
 $\sqrt{\text{love}}[+\alpha, -\beta, +\gamma]$ - IMP[$+\alpha, -\beta, +\gamma$] - N_{Aimp}[$+\alpha, -\beta, +\gamma$] - 1SG.PRES.na
 ‘I was being loved.’

Although the suffix representing the non-active voice and perfective aspect has the same morphological spell-out in both (14a) and (14b), this does not occur in the non-active, imperfective forms. This sort of relation would not have been incorporated in the system if items were arranged in blocks.

Finally, the last point that remains to be explained is the way features are checked during the vocabulary competition. I propose that a feature checking order (FCO) mechanism is available in the system. FCO ensures that morphological features are first checked and matching of the syntactico-semantic features follows. This has practical considerations serving as an economy principle during the derivation. The system will first look into the node specified for the given morphological feature –and not throughout the vocabulary- before selecting the items complying with the syntactic specification of the node.

5. Consequences

This alternative view of the DM vocabulary has interesting consequences not only from a language-specific point of view but also from a wider theoretical perspective. I first highlight the advantages for the analysis of the verbal forms in MG and I then move onto its theoretical significance.

An important aspect of the verbal forms in MG is the information regarding the conjugational classes. This information is represented in the system. It also serves as a mechanism to relate each morphological unit participating in the formation of any given verbal form, so that the correct matching of the pieces of inflection is achieved. Finally, information regarding the productivity of suppletive versus non-suppletive stems, frequency, regularity and diachrony is also welcoming. The major advantage of this treatment concerns the sharp distinction which is made between the derivation of suppletive stems in the vocabulary, as the result of morpho-lexical rules, and the formation of non-suppletive ones mainly in the morphological component.

Moreover, this alternative view also affects the process of word formation within DM. First of all, the number of the word formation processes is significantly reduced. The system looks into the vocabulary once before vocabulary insertion and picks out only the item that best matches the

morphological and syntactic specification of the node for which it competes for insertion. In addition, it turns out to be the most economical way under which the operation of vocabulary insertion applies. Again, the system does not have to search all the vocabulary entries. It will only look under the node specified for the given morphological feature. All items related to that feature are arranged under that node. Finally, the order according to which the features are checked is strictly specified. The items competing for insertion under any given terminal node in the morphological component should first match the morphological features of the node –as far as class is concerned- before checking the syntactico-semantic ones.

Lastly, the extended view of the vocabulary and its organisation influences the way allomorphic cases are explained within this framework. I assume that suppletive stems stored in the vocabulary, exhibit true allomorphy. True allomorphy is seen as an allomorphic pattern that is not conditioned phonologically –as in Hooper (1976)- or syntactically –Chomsky (1957). It is also a pattern for which morphology itself cannot account for. On the other hand, the degree of allomorphy TVs exhibit, is interpreted as distinct vocabulary entries which are also not conditioned syntactically or phonologically, as they represent different morphological features. These items are necessary to be treated as separate entries, as they serve as morphological input. Consequently, allomorphy –whether this is seen as true allomorphy or not- is considered to be the result of DM's vocabulary internal organisation and in most cases no extra stipulative rules are needed. Allomorphy is seen as a fully productive process, which has been further claimed by Lieber (1982), *contra* previous treatments (Chomsky 1957, Aronoff 1976). The ultimate result of this analysis is also that it does not complicate the grammar but, on the contrary, it flows from it.

6. Conclusion

The status and the organisation of the vocabulary in DM have been the central focus of this paper. It was argued that the vocabulary is an independent component. Readjustment rules may apply for the formation of suppletive stems, whereas the formation of non-suppletive ones mainly occurs across the syntactic and morphological components. Moreover, the vocabulary was also seen as the repository not only of syntactic but also morphological features to phonological ones. Contrary to what has been previously suggested in the literature, the VIs are not organised in blocks in terms of specificity; their organisation is subject to a hierarchy based on the degree of markedness of the TVs in MG. This hierarchy obeys to a tree-structuring pattern, similar to HPSG. The presence of morphological features, on one hand, gave rise to a feature checking order mechanism; the morphological features must be checked prior to the checking of the syntactic ones. On the other hand, the degree of markedness allowed us to account for the interrelation between VIs. This view had significant language-specific as well as theoretical consequences. Class

information was allowed to be encoded in the MG system. The relation between the units participating in the formation of the verbal forms was captured. This made the correct predictions about the productivity, frequency and diachrony of these forms. From a wider theoretical perspective, the number of processes participating in word formation was significantly reduced. The way vocabulary entries were arranged and selected for insertion was more economical, whereas the application of the processes was strictly ordered. Finally, as far as allomorphy is concerned, it was proposed that only suppletive stems formed in the vocabulary exhibit a true allomorphic pattern. On the other hand, the degree of allomorphy TVs show, is interpreted at the morphological component. Interestingly, allomorphy was treated as the result of DM's vocabulary internal organisation, and no extra rules were needed. Consequently, allomorphy is a fully productive process that does not complicate the grammar.

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References

- Aronoff, M. (1976). *Word Formation in Generative Grammar*. MIT Press, Cambridge, Massachusetts
- Aronoff, M. (1994). *Morphology by itself*. MIT Press, Cambridge, Massachusetts.
- Chomsky, N. (1957). *Syntactic Structures*. The Hague: Mouton.
- Di Sciullo, A.M. and E. Williams. (1987). *On the definition of word*. MIT Press, Cambridge, Massachusetts.
- Drachman, G., R. Kager, and A. Malikouti-Drachmain. (1995). Greek allomorphy: an optimality account. In M. Dimitrova-Vulchanova and L. Heelan (Eds.) *Papers from the first conference on formal approaches to South Slavic Languages, University of Trondheim Working Papers in Linguistics 28*, pp.345-361.
- Embick, D. (1998). Voice systems and the syntax/morphology interface. In H. Harley (Ed.), *Papers from the Upenn/MIT Roundtable on Argument Structure and Aspect*. Vol. 32, MITWPL, Cambridge, Mass., pp.41-72.
- Galani, A. (2002a). The morphosyntax of the verbal forms in Modern Greek. *Interlinguistica 13* (II), pp.153-170.
- Galani, A. (2002b). Verb formation: morphology or syntax. In M. van Koppen, J. Sio and M. de Vos (Eds.) *Proceedings of ConSOLE XI*, University of Padova, Online by SOLE, University of Leiden Center for Linguistics (www.sole.leidenuniv.nl), Netherlands.

- Galani, A. (2002c). A DM analysis of the augment in Modern Greek. In E. Deligianni and F. Goglia (Eds.) *Proceedings of the 11th PGC at the University of Manchester*, Manchester: University of Manchester, pp.12-22.
- Galani, A. (2003a). Distributed Morphology and suppletive vs non-suppletive stem formation in Modern Greek. In J. Butler, D. Morgan, L. Plug and G. Walker (Eds.) *York Papers in Linguistics*, Series 2, Issue 1, pp.93-108.
- Galani, A. (2003b). An analysis of theme vowels in Modern Greek within Distributed Morphology. *Interlinguistica* 14:399-412.
- Galani, A. (2003c). So, word formation: Syntax of morphology? Formation of non-suppletive stems in Modern Greek. In *Proceedings of the 6th International Conference of Greek Linguistics*, University of Crete.
- Galani, A. (to appear, a). Suffixes and DM: Voice in Modern Greek. In A. Galani and B. Sinar (Eds.) *York Papers in Linguistics, Proceedings of the 1st York-Essex Morphology Meeting*.
- Galani, A. (to appear, b). Word Formation: Morphology or Syntax? Evidence from the theme vowels in Modern Greek. In M. Mattheoudakis and A. Psaltou-Joycey (Eds.) *Proceedings of the 16th International Symposium on Theoretical and Applied Linguistics*. Aristotle University of Thessaloniki.
- Galani, A. (in preparation). The morphosyntax of tense and aspect in Modern Greek. PhD dissertation. York: University of York.
- Halle, M. (1997). Distributed Morphology: impoverishment and fission. In *MIT Working papers in Linguistics: Papers at the interface*. MIT Press, Cambridge, Massachusetts, pp.111-176.
- Halle, M. & A. Marantz. (1993). Distributed Morphology and the pieces of inflection. Halle, K. & Keyser, S. J. (eds), *The View from Building 20: Essays in Linguistics in Honour of Sylvain Bomberger*, MIT Press, Cambridge, Massachusetts, pp. 111-176.
- Hooper, J. (1976). *Introduction to natural generative phonology*, Academic Press, New York.
- Joseph, B. & J. Smirniotopoulos. (1993). The morphosyntax of the Modern Greek verb as morphology and not syntax. *Linguistic Inquiry* 24, 2, pp. 388-424.
- Koenig, J. P. (1999). *Lexical relations*. CSLI Publications.
- Koutsoudas, A. (1964). *Verb morphology of Modern Greek: a descriptive analysis*. Mouton and Co.
- Lieber, R. (1982). Allomorphy. *Linguistic Inquiry* 10(1), pp.27-52.
- Lieber, R. (1992). *Deconstructing morphology: word formation in syntactic theory*. Chicago, University of Chicago Press.
- Oltra-Massuet, M. I. O. (1999). *On the notion of theme vowel: a new approach to Catalan verbal morphology*. PhD dissertation, MIT
- Philippaki-Warbuton, I. (1973). Modern Greek verb conjugation: inflectional morphology in a transformational grammar. *Lingua* 32, pp.193-226.
- Rivero, A.-M. (1990). The location of non-active in Albanian and Modern Greek. *Linguistic Inquiry* 21(1), pp.135-146.
- Spencer, A. (1991). *Morphological Theory: An Introduction to word structure in Generative Grammar*. Basil Blackwell, Oxford.
- Tsangalidis, A. (1993). Extended phrase structure approaches to the verb in Modern Greek. M.Phil Dissertation. Trinity College Dublin.