1. INTRODUCTION

This study deals with theta-role saturation in deverbal and verbal compounds in Greek. We claim that theta-role saturation inside compounds is related to the configurational properties of argument structure, as well as to the properties of rich morphology, particularly to strong inflection. This claim, combined with the fact that several semantic roles may be expressed in an adjunct position whereas a more restricted set of semantic roles is represented in a complement position, can account for theta-role saturation inside Greek compounds.

The paper is organized as follows. The first section provides general information about the structural properties of Greek deverbal and verbal compounds and the kind of theta-roles saturated inside these compounds. The second section contains the basic assumptions and claims concerning morphology and argument structure in general. An analysis of Greek deverbal and verbal compounds is given in the last section.

2. THE STRUCTURE OF GREEK DEVERBAL AND VERBAL COMPOUNDS

Greek deverbal compounds with internal theta-role saturation are basically nouns or adjectives. In this paper, however, we will also account for verbal compounds since they display internal theta-role saturation.

Nominal deverbal compounds are realized as one-string formations containing at least two stems and two suffixes, one derivational and one inflectional (cf. (1)). The constituent parts are overtly realized in the following order: the inflectional suffix, responsible for the morphosyntactic features of number and case, appears at the righthand edge of the compound next to the deverbal item; the derivational suffix, transforming the verbal stem into a nominal stem, is attached to the verbal stem and a bare nominal stem is the lefthand constituent:
According to Di Sciuillo & Williams (1987), English deverbal compounds (e.g., tree-eater, thanks-giving, etc.) are morphological objects, that is expressions that are generated in morphology, whereas French compounds such as essuie-glace “wiper” and tire-bouchon “corkscrew” are syntactic words, that is expressions generated in syntax even though they are syntactic atoms. Syntactic atomicity holds for these objects that do not have a morphological form but otherwise display the general properties of X’s. In Di Sciuillo & Williams’ theory, syntactic words are firstly generated in syntax and then reanalyzed as words. They differ from idioms though, which are listed phrases, since their meaning is not compositional. Certain idioms are not syntactically atomic, however, since parts of idioms can be extracted (4a,b) or be subject to independent referential relations (4c):

(4) a. English: tabs were put on DP  
b. French: en voir de toutes les couleurs  
c. Greek: evale nero sto krasu lit. he put water in the wine his  
  'his attitude became softer'

Similarly, parts of deverbal compounds cannot be extracted. This is the case for English deverbal compounds, as discussed in Di Sciuillo & Williams (1987), and they are islands with respect to XP anaphoric relations, as noted in Giorgi & Longobardi (1991) (cf. (5)). This is also the case in Greek (cf. (6)):

(5) a. *The [who-killer] did the police catch?  
b. *A [person-informer] about himself  
(6) a. *Ton [ti-petiti] epiaze i astinomia the what-player did the police catch?  
  vs. i astinomia epiaze ton harteptxet the police caught the card gambler  
b. *Ejine anthropofaghs tu eaufr tu he became a man-eater (cannibal) of himself  
  vs. ejine anthropofaghs he became a man-eater

In this paper, we would like to take a unified approach to compound formation and adopt the idea that there is only one computational space for the derivation of the linguistic expressions which are formed by autonomous components: the morphology, the syntax and the phonology (cf. Chomsky 1995, Di Sciuillo 1996a,b). We will thus take deverbal compounds to be generated in the computational component of the grammar in a way that we will make precise below.

As has been noted elsewhere, (cf. Di Sciuillo & Williams 1987, on the basis of English and Italian; Rieper 1987 and Grimshaw 1990, on the basis of English; Di Sciuillo 1992, on the basis of Italian and English), and it has been proved by Ralli (1989, 1992) for Greek, theta-roles may be saturated inside compounds. This is evidenced in the following examples, where the admissibility of a by-phrase (7a)
and the presence of an aspectual modifier (7b) indicate that, depending on the case, some thematic roles are saturated inside the compound.

(7) a. i eleokalierjies apo tus aghrotes
   'the olive-cultures by the farmers'
   essosan tin ikonomia tu nisju
   'saved the economy of the island'
   b. i sinexis hartpeksia ton katandise fioho
   'the continuous card-playing has made him poor'

If this were not the case, it would be impossible to explain why some theta-roles of the verb included in the deverbal compound may not be saturated outside of the compound:

(8) a. *aforos ine enas hartpektis pehnidhio
   'this is a card-player of games'
   b. *i simerini laosinaksi ton anthropon ine ekpllickiki
   'today's people-reunion of men is surprising'

As a matter of fact, some deverbal compounds in -nis, like the one in (9a), are complete functional complexes with all arguments saturated inside the morphological structure of the compound. This is also the case in French, as noted in Di Sciullo (1992).

(9) a. o/enas kardjokatkitis molis ilthe
   'the/a heart conqueror just came in'
   b. *o kardjkokatkitis apo to Jani bori na ine epikinkhinos
   'the heart conqueror by John may be dangerous'
   c. *natos o kardjkokatkitiis ton kardhjon
   'here comes the heart conqueror of hearts'

A closer examination of deverbal compounds (cf. (10)) reveals that in Greek, the range of theta-roles saturated inside seems not to be restricted, contrary to what has been claimed until now on the basis of data from other languages (cf. Pesetsky 1994).

(10) a. psihopsakismo < psix- psakismo (Theme)
   lit. 'soul-searching' soul 'searching'
   b. anemodharmenos < anem- darmenos (Agent)
   'beaten by the wind' wind 'beaten'
   c. kondarohtitima < kondar- hititima (Instrument)
   'pole-stroke' 'pole' 'stroke'
   d. anthanostartos < anth- startos (Instrument/Material)
   'flower-strewn' 'flower' 'strewn'

3. THE FRAMEWORK

Along the lines of Williams & Di Sciullo (1987), Chomsky (1995) and Di Sciullo (1996a, b), we accept here that morphology is an autonomous component of the grammar providing structural descriptions for word formations. Assuming that there is only one computational space for the generation of linguistic expressions, word formations are not accessible to the syntactic operations of MERGE and MOVE, as defined in Chomsky (1995). Contrary to MERGE, the morphological operations of composition and linking do not create new categories. Contrary to MOVE, the morphological operations are not subject to the Minimal Link Condition, again as defined in Chomsky (1995). See Di Sciullo (1996b) for discussion.

We will take the morphological component to generate visible, i.e., interpretable head adjunct structures at the interface with the C-I system. We will refer to this interface as to Morphological Form (MF) and assume the definition given by Di Sciullo (1996b). MF is the X0 dimension of LF interfacing with the C-I system for X1 interpretation. The existence of an X0 dimension to LF is motivated in Di Sciullo (1996b), where it is shown that word internal interpretation, i.e., conceptual and referential opacity is not obtained in phrasal structure. In phrasal structure, the predicate argument structure interpretation is obtained, thus definite as well as indefinite reference for nominal expressions, and truth values for phrasal expressions.

Assuming the architecture in (11), X0 expressions may have a phrasal structure at Spell-Out, but not at MF/LF or at MF/PF, which we will not discuss here.

(11) Spell-Out
    / \  
    MF/PF MF/LF

At MF/LF, X0 expressions have an adjunct structure and not a specifier-head-complement structure. This is a consequence of the hypothesis that the performance system interprets canonical target configurations, that is configurations the form of which is non-ambiguous with respect to the object generated by the grammar, either word structure or phrase structure.
The presence of compounds hinge on two numerical categories as in (15), the core case of compounds being two numerical categories. Since compounds hinge on two numerical categories, there may include both noun and compound position at spell-out. In (13), the agreement on the leftmost compound position is the case in (13), the agreement is not reflected in the agreement on the leftmost compound position. Thus, in (13), the agreement is not reflected in accordance to (13) and (14), the agreement on the leftmost compound position is the case in (13), the agreement is not reflected in the agreement on the leftmost compound position.
roles may be saturated within the compounds, usually the Theme role, as exemplified in (18).

(18) Italian: porta-ombrelli "umbrella-holder"
French: essuie-mains "hand-towel"
Spanish: lavaplatos "dish-washer"
Portuguese: abre-latas "tin-opener"  

We assume that, like in English, Greek compounds have the adjunct-head configuration at Spell-Out because their lefthand noun must not be in a position where case is assigned. As stated in the second section of the paper, this noun is a bare stem without an overt inflectional suffix and, as such, it cannot undergo Longobardi's (1994) overt N to D movement, as proposed in Di Sciullo (1996a) for Romance compounds, which are syntactic words. Thus in Greek, this noun must appear in adjunct position at Spell-Out, a position where case is not visible and a position where a large variety of roles can be expressed.

In a language with weak morphology, such as English, compound internal theta-role saturation is restricted, although not limited to only one theta-role, as is the case for most Romance languages, given the possibility of recursion to the left. On the contrary, in Greek, which is morphologically rich, bearing overt verbal and nominal inflection, as well as a significantly rich derivation, compound internal role saturation is particularly extensive.

We will see below that the interaction of rich morphology with the configurational properties of compound structures allows us to account for the facts in Greek.

5. AN ANALYSIS OF GREEK DEVERBAL AND VERBAL COMPOUNDS

As we have seen in the second section, in a typical Greek deverbal compound, a bare noun precedes a deverbal inflected category. Moreover, the language allows various theta-roles to be saturated inside the compound.

The bare noun in the adjunct position acts as a modifier of the morphologically complex head and may assume an additional semantic role to the one already expressed by the theta-role originating in the lower complement position. This can be seen in a number of compounds where the nominal first member may denote both a theta-role and a Possessor role. For example, in a compound such as horofilakas 'country-guard/country-keeper', the nominal stem hor- 'country' can be an argument of the predicative head flak- 'guard/keeper', and thus related to the Theme role of that head, as well as a modifier of the derived-inflected nominal filakas, where then a Possessor role. This fact further motivates the structure given under (13b), where the nominal underlying stem hor-, being an adjunct to the derived-inflected nominal element filakas, is linked to the argument position of the verbal base filak-. The position of the adjunct next to the complex nominal is also supported, if we assume, following Grimshaw (1990), that, contrary to verbs, nouns do not theta-mark.

(19) N  
| N  
| N  
| N  
| N  
hor- V N  
|  
| V e -as  
|  
filak-

Let us see now how rich morphology, namely suffixation, can affect theta-role saturation inside compounds.

Until now, we have considered suffixes to be carriers of both derivational and inflectional properties (cf. (12), (19)). In what follows, we will make a distinction between derivational and inflectional suffixes since in most Greek morphological complex words, the two types of suffixes are clearly separated and do not intermingle. See Ralli (1994b) for a detailed study of these two types of suffixation.

In general, the relation between suffixation and the presence of argument within the structure of Greek deverbal compounds has been taken in consideration by Roepoff's (1987) statement according to which, an argument-head relation is allowed in compounds if a suffix is present.

With respect to derivation, in Greek deverbal compounds, a derivational suffix transforming the verb into a noun, is generally present. As we see below, Greek data support the view that it is the presence of this suffix that extends the saturation of various theta-roles inside compounds. For instance, the examples listed under (20) show that the Agent/Instrument role may be saturated inside compound containing specific derivational suffixes:

(20) a. thalasodharmenos < thalas- dhar-. -men-os  
   'beaten-by-the-sea' 'sea' 'beat'-en nom., sing.

b. iliolustos < ili- lus-. -t-o- 
   'washed-by-the-sun' 'sun' 'wash'-ed nom., sing.

c. pondikofaghosa < pondik- fagh-. -ma-. -os  
   'rat-eating' 'rat' 'eat'-ing nom., sing.

d. aetopetaghma < aet- petagh-. -ma-. -os  
   'eagle-flying' 'eagle' 'fly'-ing nom., sing.

e. lemonostifitis < lemon- stiv-. -ti-. -os  
   'lemon-squeezer' 'lemon' 'squeeze'-er nom., sing.

The fact that derivational suffixes such as -men-, -t- and -ma- (cf. (20a-d)) allow theta-role saturation inside compounds has already been observed by Ralli (1992) where it is proposed that these suffixes perform a lexical operation on the argument
structure of the verb, either by suppressing the real subject argument of the verb or by transforming it into a complement. On the other hand, it is already an established fact that the -ti suffix (cf. (20:e)) is linked to the Agent role of the verbal base (cf. (12) above). Several works exist on this matter, particularly with respect to the status of the derivational suffix -er, the English correspondent of -ti(t). To mention a few, cf. Fabb (1984), Grimshaw (1990), Di Sciullo (1992) for English, and Kakouriotis (1993) for Greek.

Therefore, Roepers's statement about the role of suffixes in deverbal compounds is valid, but also too general because it does not explain why, for example, saturation of the Agent role inside deverbal compounds occurs only in the presence of specific suffixes (cf. (20)). As a matter of fact, this statement has been refined by Di Sciullo (1991) who showed that the simple presence of a suffix is not sufficient to determine whether an argument-head relation holds in the compound structure. For Di Sciullo, the determinative factor about the presence of argument-head relations in compounds is the nature of the suffix. By following this proposal, we can predict why other Greek derivational suffixes, such as -si(t) and -sim(o), do not allow the Agent role saturation inside deverbal compounds. The compound words *fidhosisimo* 'snake-crawling', *jinekoferismo*, 'woman-behavior', *trihoptosi*, 'hair-fall', *filoroi* 'leaf-flow', proposed by some native speakers as counter-examples to this statement, constitute only apparent exceptions. In *fidhosisimo* and *jinekoferismo* we have middle verb formations, and in the examples *trihoptosi* and *filoroi*, the verbal bases belong to the ergative class of verbs. That is in both cases, we deal with real internal arguments appearing in complement position.

At this point, we are allowed to say that Greek data enable us to pursue Di Sciullo's refinement even further. We will claim that the inherent properties of derivational suffixes make possible and, at the same time, restrict the choice of theta-roles within compounds, depending on the nature of the suffix, but the presence of an inflectional suffix allows the occurrence of non-restricted theta-role saturation. That is why in languages weak in inflectional morphology, like English, theta-role saturation is possible but limited, contrary to what happens in languages, like Greek, with strong inflectional morphology, where more theta-roles may be saturated by the nominal non-head within compounds. It is this property of inflectional affixes to extend theta-role saturation within compounds, independently of the presence of derivational affixes, that can explain the presence in Greek of a considerable number of verbal compounds, as in (21), whose second member is an underived inflected verbal form and the first member assumes the role of an argument of the verb.17

(21) a. hartopezo < hart- pez- -o (Theme)
   'I play cards' 'card' 'play' 1st per. sing. present, active

b. ematokilo
   'I (make something) wallow in blood'
   < emat- kil- -o (Location)
   'blood' 'wallow' 1st per. sing. present, active

c. thalasodhernome < thalas- dhern- -ome (Agent)
   'I am beaten by the sea' 'sea' 'beat' 1st per. sing. passive

d. dhjaaloistelno
   'I send (something/somebody) to hell'
   < dhjaal- steln- -o (Goal)
   'hell' 'send' 1st per. sing. pres. act.

e. oksfIGHonokolo
   lit. 'I attach (something) by using oxygen'
   < oksfIGHon- kol- -o (Instrument)
   'oxygen' 'attach' 1st per. sing. pres. active
   = 'I weld'

The rich internal theta-role saturation in compounds like the ones above suggest that constraints such as the First Sister Principle (cf. Roepers & Siegel 1978), or the most recent proposal that a Locative role cannot appear in compounds without the presence of the Theme role (cf. Pesetsky 1994), cannot be universal. Their application in a particular language depends on the general configurational properties of this language as well as to its morphological variation.

Before concluding, we would like to propose the morphological structures in (22), as possible generation schemas for Greek deverbal (22a) and verbal compounds (22b). These structures are motivated by the following basic assumptions:

a) Inflection is a word internal process (cf. Booij 1993, Chomsky 1995, Ralli forthcoming, among others).

b) Derivational suffixes are distant from inflectional ones, and both of them are heads of the structures into which they participate (cf. above, and Di Sciullo & Williams 1987).

c) In the morphological component, structures are right-headed (cf. sections 2 & 4, and Williams 1981; Di Sciullo & Williams 1987; Di Sciullo 1996).

(22) a. N
   / \  
   / \  
   N Ninfl. suf.  V Vinfl.suf.
   / \  / \  
   N N  N V
   / \  / \  
   V Nder.suf. V e
   / \  
   V e

In the structures given above, the bare nouns appear in adjacent position, but are linked to the verbal complement position e. Thus, the range of theta-roles saturated inside the compounds, as well as all possible modifier roles expressed by the bare nouns. are accounted for. Both derivational and inflectional suffixes are represented
word internally, and their presence contributes to the extensive saturation of theta-roles.

Notice that the inflectional suffix constituent appears at the topmost level of word formation, and not at a lower level as the structures in (23) below suggest:

(23) a. N b. V
   / \ / \ 
   N N N V
   / \ / \ 
   / \ / \ 
   V Nder.suf. V e

Were the structures in (23) the correct ones, it would be difficult to explain why the lefthand noun is always a stem and is never combined with an inflectional ending. Moreover, a representation that displays the inflectional suffix to have scope over the two members of the compound structure, provides a better account of the fact that, in some cases, the inflectional endings of the compound words are different from those which are borne by the second member taken in isolation. The examples below illustrate this last remark.

(24) kisifomaho < kisif- -mah- -o
     'I fence' 'sword' 'fight' 1st pers. sing.
vs.
maxome < max- -ome
     'I fight' 'fight' 1st pers. sing.

6. SUMMARY

In this paper, it has been argued that argument structure defined in purely configurational terms is related to rich morphology, both derivational and inflectional. Evidence is presented to the effect that the conjunction of the configurational properties of deverbal compounds with the properties of their morphological system allows to make predictions on the internal saturation of arguments/theta-roles.

NOTES

1This work has been supported in part by the grant from the Social Sciences and Humanities Council (441-92-0012) attributed to Anna Maria Di Sciullo and by a grant from the University of Athens research Commission (704-1681) attributed to Angela Ralli.

2 More than two stems and more than one derivational affixes may be recursively added to the basic structure of compounds. Note, however, that only one inflectional affix is allowed in one-string compound formations, as in any other lexical morphologically complex form.

3 As shown in Ralli (1994a), the feature of gender inherently marks stems and/or derivational suffixes, but not inflectional suffixes, contrary to what traditional grammars describe. The inflectional properties of Greek compounds are extensively discussed in Di Sciullo & Ralli (1994). We will relate the inflectional properties to thematic constituents in the last section of the paper.

4 Greek examples will appear unstressed. For a description of the stressing procedure in Greek compounds, cf. Nespou & Ralli (forthcoming). Conventionally, all nominal compounds will be given in nominative singular forms, while verbal compounds will appear in the present tense, particularly, in the form of the first person singular.

5 Phonologically, [gh] is palatalized before [l].

6 [s] becomes [z] before the voiced [m].

7 According to a proposal forwarded by Ralli (1992), the structure of Greek deverbal compounds is either as in (a) or as in (b), assuming that categories such as 'word', 'stem' 'suf' (derivational and inflectional) and 'pref' constitute primitives of the morphological analysis (cf. also Ralli 1989 and 1994b):

(a) N<word>
   / \ / \ 
   N<stem> N<word>
   / \ / \ 
   N<inf.suf> N<deriv.suf>
   / \ / \ 
   V<stem> N<deriv.suf> V<deriv.suf>

(b) N<word>
   / \ / \ 
   N<stem> N<word>
   / \ / \ 
   N<inf.suf> N<deriv.suf>
   / \ / \ 
   V<deriv.suf> N<der.suf>

However, only the structure under (a) is adopted in a phonologically motivated proposal forwarded by Nespou & Ralli (forthcoming), where it is claimed that deverbal compounds and, generally, compounds containing a derived-inflected item as their second member behave differently from other compounds (i.e., compounds whose second member is not derived-inflected) with respect to stressing procedure. That is, the former preserve the stress of their second member since they are of a [stem word] type, as opposed to the latter, belonging to a [stem stem] type, which are subject to the application of a special stress rule bound only to these formations. We will not discuss these properties here.

8 It should be noticed that -as is not a single suffix in Greek since it contains both derivational (ct-) and inflectional material (-as). In the last section of the paper, we will make a distinction between derivational and inflectional suffixes.

9 In the modular approach assumed here, theta-role saturation by affixes is allowed because arguments/theta-roles are generally saturated by head chains in word structure and not only bare nouns but affixes too may be part of a chain saturating an argument (cf. Di Sciullo 1993).

10 As stated in the second sentence, the -as appearing between the first and the second member of the compound constitutes a transition vowel.

11 Although this compound is not an attested word of the language, it is not considered to be an ungrammatical formation by most native speakers.


13 For simplicity reasons, -as is considered to be an inflectional suffix with category-changing properties. See, however, note 13 for a different view.

14 In some cases though, the derivational or the inflectional suffixes are not overtly realized. These cases are analyzed by Ralli (1988) as containing a -as suffix.

An example of a derivation process is provided by the noun filosakas *guard/keeper* above (cf. (19) horofilakas *country-guard/keeper*), where the nominal stem filak- derives from a verbal stem by the addition of a suffix -as constitutes the inflectional suffix which is attached to the nominal stem in order to form the word filosakas. A a inflectional process is illustrated by the examples given under (20d).

Notice, however, that no Greek word may display both derivation and inflection realized as a suffixation processes.
It should be noticed that beside the Agent, that is the person who carries out the act, the -tis derived nominals may also express the instrument that does the act (cf. Triantaphyllidis, 1941 for a list of these derived formations in Greek). This type of instrument which may assume the function of a grammatical subject is called by Marantz (1984) an intermediary instrument.

Inflectional suffixes following derivational ones appear in parentheses.

Notice that also in English there are verbal compounds with internal theta-role saturation (e.g., to bar-tend). However, their number is rather restricted compared to the considerable occurrence of verbal compounds in Greek.

A different view is expressed by Nespoul and Ralli (forthcoming) who opt for the structures given in (23) as possible generation schemas of Greek verbal and deverbal compounds. Nespoul and Ralli consider these compounds to belong to the [Stem Word] type. Under this assumption, the lefthand noun (i.e., the bare noun stem) is added to a fully inflected word containing a stem, of either a nominal or a verbal category, and a corresponding inflectional suffix. In other words, in Nespoul and Ralli's work, the inflectional suffix is represented as attached to the righthand member of the compound. As stated before (cf. Note 6), Nespoul and Ralli's claim is motivated on phonological grounds, while our proposal here relies on morphological and syntactic considerations. According to recent developments of the theory, the structures of linguistic expressions do not have to be isomorphic at both interfaces, the PF and the LF (cf. Chomsky 1995, for discussion).

References


