On the role of syntactic locality in morphological processes: the case of (Greek) derived nominals[1]

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1. Introduction

A certain amount of consensus exists that the generalization in (1) holds across languages (though expressed from different theoretical viewpoints, see Grimshaw 1990, Bierwisch 1989, Borer 2001, to appear, Alexiadou & Grimshaw to appear among others):[2]

(1) Derived nouns that have argument structure inherit this in some form from their verbal source[3]

Under a specific understanding of (1), which I follow here, (1) basically says that in order for a noun to have argument structure (AS) this must have been a verb at some point in its derivational history. This suggests a very concrete relationship between morphology and the presence of AS. In particular, it suggests that in languages with verbalizing morphology, nominalizing morphology should appear at the outside of the verbalizing markers and these derived nominals should always (i) bear meanings related to their verbal source and (ii) have AS.

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[1] I would like to thank Hagit Borer, Heidi Harley, Hans Kamp, Florian Schäfer, two anonymous reviewers as well as the participants at the workshop on "QP structure, Nominalizations and the role of DP" in December 2005 in Saarbrücken for their comments. Special thanks to the editors of this volume whose comments greatly improved the readability of the paper. The idea to look at the different nominal derivational patterns of Greek grew out of a seminar on nominalizations at the graduate seminar at the University of Crete in May 2005. I would like to thank Elena Anagnostopoulou and the participants for their input and their suggestions. This work was supported by a DFG grant to the project B1: *The formation and interpretation of derived nominals*, as part of the Collaborative Research Center 732 *Incremental Specification in Context*.

[2] But cf. Ehrich & Rapp (2000).

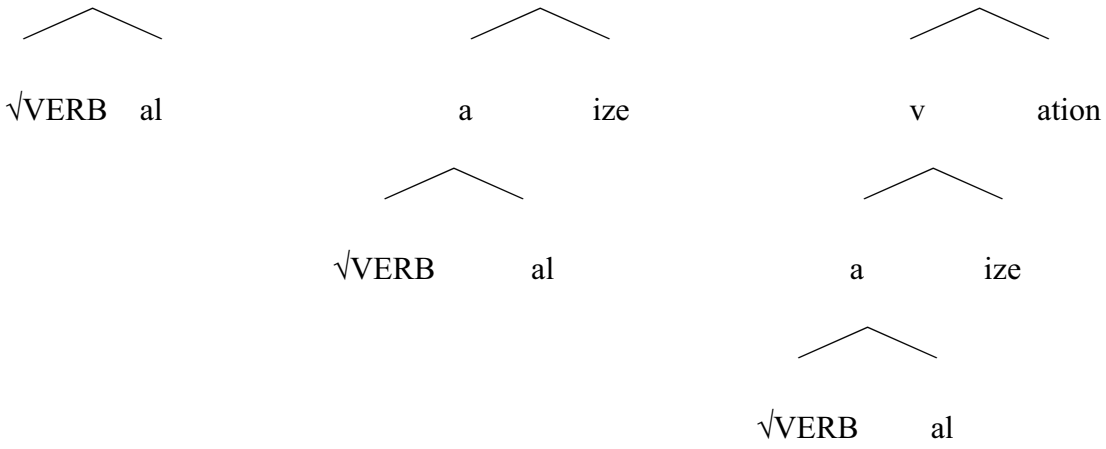
[3] Note that (1) does not refer to nouns expressing kinship terms and body parts, which are taken to be inalienable possessor constructions. As I argued in Alexiadou (2003), such nouns also license arguments, the inalienable possessor being then an argument of the possessed noun.

This prediction is even stronger in frameworks that take elements such as nouns and verbs to have no universal significance and to be essentially derivative from more basic morpheme types. As the present paper adopts such a framework, let me briefly illustrate here how the reasoning works. [4] Recent work in Distributed Morphology (DM) has proposed that elements such as nouns and verbs can be defined as Roots which combine with category determining functional heads as shown in (3), see Halle & Marantz (1993), Marantz (1997), Harley & Noyer (1998), Embick & Noyer (to appear), Alexiadou (2001), Harley (this volume) and cf. Borer (2005) for related ideas. On this view, all word formation is syntactic, i.e. there is no word formation in the lexicon.[5]

Consider now the example in (2), taken from Borer (2001). In (2), **-***ation* attaches to verbal formations only, i.e. to forms that must first become verbs and cannot attach to forms that have not been verbalized. In order for this argument to go through, one must assume that -*ize* functions as verbalizing morphology in English, as suggested by e.g. Embick (2004), Harley (this volume) and others. The morphological structures for (2) are given in (3):

(2) verb verb-al-ize verb-al-iz-ation *verbalation

(3)



[4] Since Harley's contribution in this volume offers a summary of the main assumptions in DM I will not go over that here.

[5] For a different view on nominalizations, see Bierwisch (this volume). For a comparative appreciation of lexical and syntactic approaches to nominalization see Alexiadou & Grimshaw (to appear) and Alexiadou, Haegeman and Stavrou (2007).

The above analysis correctly predicts data such as the ones in (4). Arguably, *verbalization* is derived from the verb *verbalize*, *verb* clearly is not. Hence only the former is expected to license AS.

(4) the verbalization of their concerns took a long time/*was on the table

(4) involves an AS-nominal, while the noun *verb* is called in the literature referential nominal. The properties of the two classes of nominals are listed below (based on Grimshaw 1990 and Borer 2001):

Table 1

R(eferential) Nominals	**Argument structure (AS)-Nominals**
non-θ-assigner, No obligatory arguments	θ-assigners, Obligatory arguments
no event reading	event reading
no agent-oriented modifiers	agent-oriented modifiers
subjects are possessives	subjects are arguments
by phrases are non-arguments	*by* phrases are arguments
no implicit argument control	implicit argument control
no aspectual modifiers	aspectual modifiers
modifiers like *frequent, constant* only with plural	modifiers like *frequent, constant* appear with singular
may be plural	must be singular

The above view, however, faces a couple of problems, already noted in Borer (2001), and the present paper attempts to deal with them. To begin with, deverbal nominals are ambiguous in several ways (Grimshaw 1990). The point here is that derived nominals can also have a 'simple' event reading (5a), under which they are like AS-nominals in that they have an event interpretation, but with respect to all the other properties in table 1 they pattern like referential nominals. In addition they can also bear a result reading, under which they refer to a result of a process (and under which of course they behave as referential nominals), see (5b):

(5) a. the examination lasted for hours *simple event*

b. the examination was on the table *result*

But, if the form *examination* always has a verbal source, as the above reasoning suggests, then AS should always be present irrespectively of the interpretation of the noun. See also Ackema & Neeleman (2004) and Harley (this volume) for discussion.

Second, zero derived nominals in English, Borer and Grimshaw argue, lack AS. The point here is that these nouns look most like verbs, but unlike verbs they can never license arguments. Although in section 2 we will see that the strong form of this generalization does not hold, still the distinct behavior of (6) as opposed to (7) is at first sight puzzling.

(6) the formation/forming of nominals by movement rules (Borer 2001)

(7) *the form of nominals by movement rules

The above leads us to the formulation of the following question: What is the relationship between form and meaning in connection to AS inheritance? The paper attempts an answer to this by examining the properties of nominalizations in mainly Greek in comparison to English. The main points that will be made here are: first, in cases where nominal affixes attach outside verbalizing affixes, the result meaning is compositional predicted from the meaning of the verb. Second, the presence of AS should be dissociated from the presence of verbalizing morphology. In order to capture data as the ones in (5) above, I propose that the difference between AS and non-AS nominals does not depend on the presence of verbalizing morphology (taken here as a signal of a verbal source). This leads us to a weakening of the generalization in (1), since the presence of a verbal source is not a prerequisite for the licensing of AS.

The paper is structured as follows. In section 2, I briefly summarize the facts on English and Greek nominalizations. In section 3, I discuss English nominal derivation in some detail. In section 4, I turn to the question of licensing of AS in nominals. In section 5, I turn to the issue of the optionality of licensing of AS in the nominal system.

2. The form of English and Greek derived nominals

2.1 Some generalizations about English

Let us first examine the relationship between the form of English nominalizations and their ability to license AS. Here I only concentrate on three processes which create nouns out of verbs: by zero affixation, by affixation with *–ing* (gerund), and by affixation with *–(a)tion*.

In the literature it has been argued that (i) zero derived nominals have no AS (Grimshaw 1990, Borer 2001, Alexiadou & Grimshaw to appear), e.g. **Kim's break of the vase*; (ii) nominal and verbal gerunds always have AS, see Lebeaux (1986), Grimshaw (1990) and Harley & Noyer (1998), e.g. *Kim's breaking of the vase*/*Kim's breaking the vase*;[6] (iii) (*a*)*tion* nominals are frequently ambiguous between AS and R-readings, see (5).

Concerning (i), Smith (1972) discussed verbs of English which display the causative/inchoative alternation, and nominalize without (overt) affixation. Smith points out that these verbs never nominalize as "transitive" nouns, but only as nouns with a possessive alone, i.e. they behave like R-nominals. Examples include *end* and *stop*, which form nominals, but not transitive ones. The generalization is visible in these contrasts: *the race's end*/**the judge's end of the race*; *the train's unscheduled stop*/* *The guard's unscheduled stop of the train*. Smith argued that the ability to derive "transitive" causative nominalizations from "intransitive" causative verbs is limited to affixes drawn from the Latin vocabulary and is not seen in the Anglo-Saxon vocabulary of English. Thus *termination* contrasts with *stop*, and *conclusion* with *end.*

Newmeyer (to appear), however, challenges the accuracy of this generalization as to the behavior of zero derived nominals, and discusses the following set of examples, see also Harley (this volume):

[6] Apparent counterexamples seem to be lexicalizations: *a good living*, *hand-writing* etc.

(8) a. the frequent release of the prisoners by the governor

b. the frequent use of sharp tools by underage children

c. an officer's too frequent discharge of a firearm

d. the ancient Greeks' practice of infanticide

e. my constant need for approval

Still Newmeyer admits that 'perhaps the large majority of AS-Nominals are morphologically complex'. The reasons that lead to this rather messy picture presumably relate to the historical development of the vocabulary of English. For the purposes of this paper I will assume that the nominals of the type in (8) involve zero morphology. A brief survey of the examples offered by Newmeyer and Harley suggest that the zero nominalizations with AS tend to involve Latinate/French roots.[7] If this is indeed correct, then probably we are dealing with a case of allomorphy in the area of Latinate roots, i.e. *-ation* and zero are allomorphs competing for insertion under n. This is not problematic for DM based approaches, but it is problematic for approaches that deny the existence of zero derivation (Borer 2001). I will consider (i), however, as a strong tendency, which still awaits an explanation. Thus all Romance roots give AS nominals, while this is not the case with all Germanic ones (leaving affixation of *-ing* aside, which applies to both Germanic and Romance roots; see Alexiadou & Grimshaw to appear for a recent discussion and references). Let us now see how Greek nominals behave.

2.2 Some generalizations about Greek

One important difference between English and Greek nominal morphology is that Greek nominals have inflectional classes. The result is that bare/root nouns of the type in (8) do not exist in Greek, as all nouns belong to a particular class and take a set of inflections for case in both singular and plural. This is illustrated in (9), where the singular of the non-derived noun

[7] Thanks to Gianina Iordachioaia for checking the origin of these examples.

'yard' is compared to that of a verb-derived nominal 'destruction'. As can be seen, both take the same set of inflectional affixes:

(9) a. *avli* 'yard' SINGULAR

Nom avl**i**

Gen avl**is**

Acc avl**i**

b. katastrofi 'destruction' SINGULAR

Nom katastrof**i**

Gen katastrof**is**

Acc katastrof**i**

The affixes that signal class are of course non-derivational. One could assume that they are generated in some nominal functional projection (NumberP). The reader is referred to Alexiadou & Müller (to appear) for further discussion of Greek nominal inflection and references.

There are a number of affixes that can attach to a verbal stem and create a deverbal noun. The most common affixes are: **-m-**, **-sim-**, and **-s-**, illustrated in (10). The picture in (10) is rather complex. First, it is by no means clear how to split stems and affixes in Greek and there exists quite some disagreement among morphologists. Here following Ralli (1988), I take *-s-* in suffixes such as *-s-i* and *-sim-*o to be part of the suffix and not of the stem. Second, **-m-** and **-sim-** are taken to be allomorphic realisations of the same affix depending on the number of syllables of the stem: **-sim-** attaches to stems with one syllable and **-m-** is the elsewhere form (Malikouti-Drachman & Drachman 1995).[8] I will refer to these nouns as **-m-** nouns here. As (10d) shows, there are verbs and derived nominals related to 'adjectival' stems:

(10) N V N

[8] Interestingly when two forms exist, i.e. one ending in **-m**a and one ending in **-sim**o, they have different meanings: only the **-sim**o ones refer to events, cf. grama 'letter' vs. grapsimo 'writing'.

a.	kubi	kub-**on**-o	kubo**m**a		
	button (n)	*button* **(**v)	*buttoning*		
	ladi	lad-**on**-o	lado**m**a		
	oil (n)	*oil (v)*	*oiling*		
	N	V	N		
b.	vrasi	vraz-o	vra**sim**o		
	boil(n)	*boil (v)*	*boiling*		
	plisi	plen-o	pli**sim**o		
	wash(n)	*wash(v)*	*washing*		
c.	alifi	alifo	alima		
	ointment	*anoint*	*anointing*		
	vafi	vafo	vapsimo		
	paint(n)	*paint(v)*	*painting*		
d.	A	V	N	N	N
	katharos	kathar-**iz**-o	katharis**m**a	katharis**m**os	kathar**s-**i
	clean	*clean*	*cleaning*	*cleaning*	*catharsis*
	aspros	aspr-**iz**-o	asprism**a**		
	white	*whiten*	*whitening*		

As we can see in (10), more than one nominal form can be related to a particular verb and even traditional grammars observe that when two different nouns relate to a verb the result is a difference in meaning (e.g. Mirambel 1958). What we can also see is that certain nominals such as *kubi* and *alifi* do not contain special nominalizing morphology, while the -m- nouns and -s- nouns do.

Third, there is a class of nominalizations that only shows stem alternation. One could argue here that these nouns contain zero nominalizing morphology, and the stem alternation is a case of Readjustment rules (see Alexiadou 2001):

(11)

kata-str**ef**o	kata-str**o**fi
destroy	*destruction*
peri-str**e**fo	peri-str**o**fi
revolve	*revolving*

The above pattern is subject to one important restriction. As Kolliakou (1995) observed, **-m-** is sensitive to the aspectual type of the predicate related to the nominal. Prototypical state and telic event predicates do not give grammatical nominalizations when they combine with the affix *-ma/mo*:[9]

(12)

a.	*agapima	agapi	agapo
	loving	*love*	*to love*
b.	*katastrema	katastrofi	katastrefo
	destroying	*destruction*	*to destroy*
c.	*dolofonima	dolofonia	dolofono
	assassinating	*assassination*	*to assassinate*

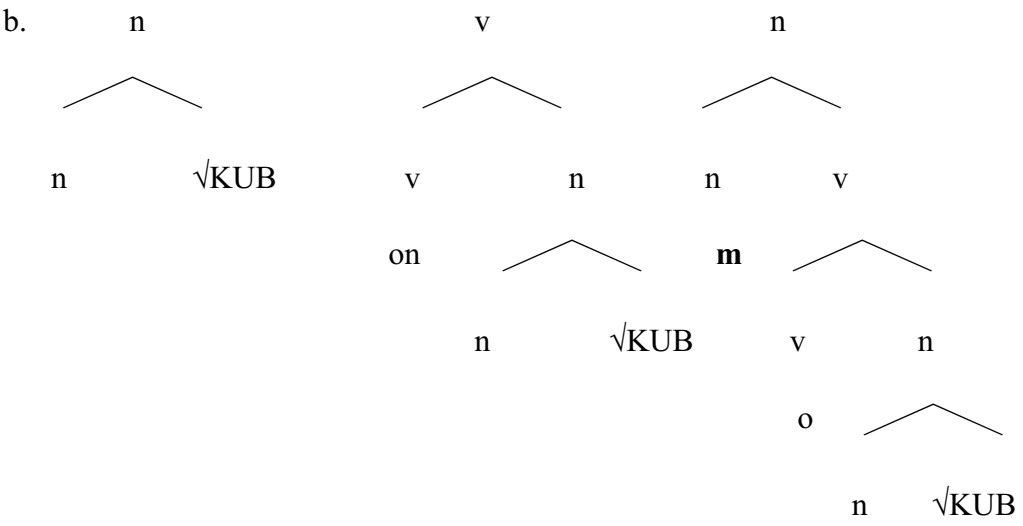
The question that arises is the following: in cases where one verbal form is linked to two nominal forms, how are the three forms related to one another? In principle there are two ways to go and in what follows I will sketch both of these. For my argumentation it is crucial that the nouns which can license AS are necessarily derived from a verbal source. It is for now an open issue whether the non-AS nouns, e.g. *button*, *wash*, *paint* etc. and their related verbs are root derived or are found in a derivational relationship to one another.

[9] Anastasia Giannakidou (pc) points out that nominals such as *skotomos* 'killing' and *skotoma* 'kill' exist, contradicting Kolliakou's observation. Though a detailed study of the formations has not been undertaken, this seems to suggest that morpho-phonological reasons also play a role: the verbs in (12c-d) are compound formations, while *skotono* 'kill' is not.

According to one possible interpretation of these patterns, building crucially on Arad (2003) and references therein, one could suggest that what we see in (10) involves three major patterns of derivation in Greek.[10] Thus, examples of the type in (10a) could be argued to form a first class where a noun is derived from a root and then this noun becomes a verb through the presence of verbalizing morphology, *-iz-,-on-*, etc. The verb then turns into a noun through the addition of **-m-** (or **sim-**). This potential path of derivation is illustrated in (13):

(13) a. kubi 'button' kub**on**o 'to button' kubo**m**a 'buttoning'

b.



The "de-adjectival" formations could also be argued to belong in this category, i.e. the -m- nouns are derived by a verbal stem that contains a special affix (Giannakidou & Merchant 1999, Alexiadou 2001). The -s- noun on the other hand is root derived:

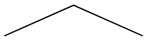
(14) √KATHAR

a. v = katharizo 'clean'

[10] In all the structures below I abstract away from inflectional endings located in T° for verbs and (presumably) in Number° for nouns, as well as from the presence of D°.

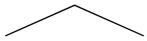
. b. n katharisma 'cleaning'

v m



√KATHAR iz

c. n 'catharsis'



√KATHAR s

The patterns in (14b) and (13b) show the presence of overt verbalizing morphology. Alexiadou (2001) took *-iz-*, and *-on-* to be overt reflexes of v without making any claims on their semantic import. Giannakidou & Merchant (1999) analyse them as causativization affixes which carry the result meaning in them. Crucial for present purposes is the claim that these suffixes instantiate a verbal head which is associated with process/event semantics.[11] In section 4, I come back to this.

On the basis of the logic just outlined, the first noun (13a) denotes an entity and the verb refers to some activity that necessarily involves this entity, i.e. buttoning. The -m- noun (13c) then denotes the activity expressed by the verb. Arad and Kiparsky take modification via PPs as an argument for this particular order of derivation. We see that this can be applied to Greek as well:[12]

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[11] Giannakidou & Merchan (1999) offer a very concrete semantic analysis of the processes of complex event formation in Greek which makes use of structures such as the one in (14a) with certain differences in the notation, illustrated in (i):

(i) $[_{V^\circ}$ A° {kathar-} V° {izo}]

The authors remain neutral as to whether (i) is derived syntactically via raising of A° to head-adjoin to the verbal suffix in V°, or via a purely morphological rule that derives verbs from adjectives. The claim in this paper is that we are dealing with a syntactic derivation involving a category neutral root, which denotes a state -as in Giannakidou & Merchant's analysis- and combines with a v head.

[12] Anastasia Giannakidou (pc) points out that *kubono* in Greek has a second interpretation meaning close which does not involve a button at all. This is clearly not a meaning derived on the basis of the morpho-syntactic composition outlined here. It is precisely for this reason I believe that several speakers of Greek accept (15b) as grammatical; for these speakers (15b) means something like 'he closed his trousers with the zipper'.

(15) a. *Jim buttoned up his pants with a zipper

b. ?* O Janis kubose to pandeloni tu me to fermuar

John buttoned his trousers with the zipper

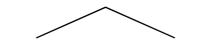
The idea here is that one cannot button without using a button. The question of course here is whether we necessarily need to make reference to a nominal structure, or whether the contrast in (15) is a result of the instrument/entity interpretation of the root involved in the construction.

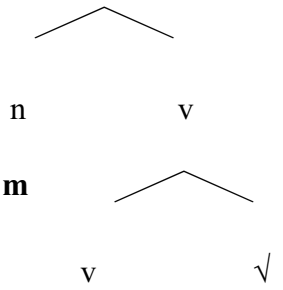
Turning to the data in (10b), we could see them as forming a second class, where both nouns refer to the meaning of the verb. The -**m**- noun refers to the process expressed by the verb (16c), the non -m- noun not necessarily (16d). Both, however, seem to have eventive readings. In many cases, only the -m- noun is available (16e-f). The noun denotes an activity.

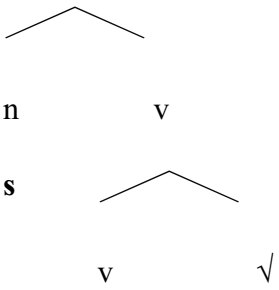
(16) a. plisi pleno plisimo

wash *to wash* *washing*

b. v c. n d. n



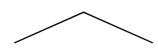


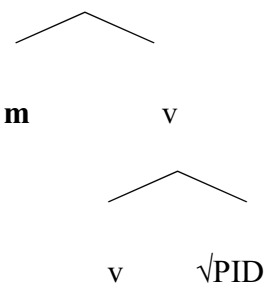


e. pidao pidima

to jump *a jump*

f. v n





Here the issue that arises is whether step (16d) is necessary. In other words, the structure seems to compete with the one in (16c) and it is not clear what decides the choice of the particular vocabulary item. One could imagine that the non-m-noun in (16d) is root derived, and event interpretation is linked to the special root contained in the structure.

Finally, the examples in (10c) above could be argued to instantiate cases involving root derived nominals and verbs, while the -m- noun is derived from the verb. But, can we really distinguish between (10a) and (10c)? The evidence discussed in Kiparsky and Arad and briefly illustrated above relates to modification via PPs. As we saw, *button* verbs do not allow PP modification. Under the analysis of this third category as involving root derived verbs we would expect modification via PPs to be licit.

In an attempt to generally apply this test to the Greek examples certain complications arise. First, Greek root derived verbs differ from their English counterparts. In English verbs like *anchor, hammer, string, house, dust* and *powder* differ from *button* verbs as far as PP modification is concerned in the following manner (see Kiparsky 1982, Arad 2003 and cf. Harley 2005). As the contrast between (17a) and (17b) shows, modification is possible with *hammer* verbs, as the verb does not mean strike with a hammer. Arad shows that this test can apply to other classes as well, such as the location and locatum verbs (17b-c):

(17) a. He hammered the nail with a rock

b. She powdered her face with chalk

c. *She sugared the tea with jam

If we apply the same logic to the Greek verbs, we obtain the following results:[13]

(18) a. ?*sfirokopise to karfi me mia petra

hammered the nail with a stone

'She hammered the nail with a stone'

[13] It should be noted here that speakers do not fully agree on the status of (18a-b). Some share the intuition that (18a) is ungrammatical, since the verb includes the word hammer, and others analyze *powder* in (18b) as simply meaning apply or paint.

b. ?*pudrarise to prosopo tis me kimolia

powdered-3sg the face hers with chalk

'She powdered her face with chalk'

We saw that Greek *button* verbs behave much like their English counterparts. However, Greek *hammer* and Greek *powder* are unlike their English counterparts. Why? In order to answer this question, we have to consider the fact that the Greek counterparts of certain of these verbs are morphologically complex:

(19) a. sfiro-kopo sfiri

hammer-cut *hammer*

to hammer

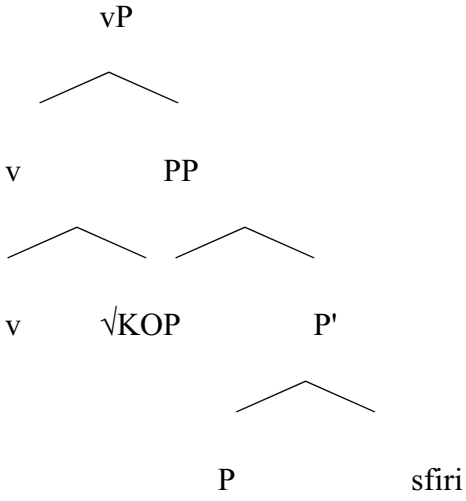
b. pudr-ar-o pudra

to powder *powder (n)*

In the first case the verb includes the word *hammer* and a light verb bearing the meaning of *cut/hit*. In the second case, i.e. Greek *powder*, the verb consists of a root, and the affix ar- attached to it. As already mentioned, such affixes are eventive verbalizers. Hence the meaning of the complex is 'apply powder' or 'decorate with powder'. This phenomenon can be subsumed under the broad concept of Manner incorporation (Hale & Keyer 2002, Harley 2005 and references therein).[14] On this view, the meaning of (18a) is something like *hit with a hammer* and the meaning of (18b) is something like *apply powder*. For this reason, modification by a further PP is odd at least for some native speakers of Greek. (20) below illustrates the structure assumed for (18a):

[14] The availability of this process is connected to the lack of resultatives in Greek, see Giannakidou & Merchant (1999), also Alexiadou (to appear) for a DM based approach.

(20)



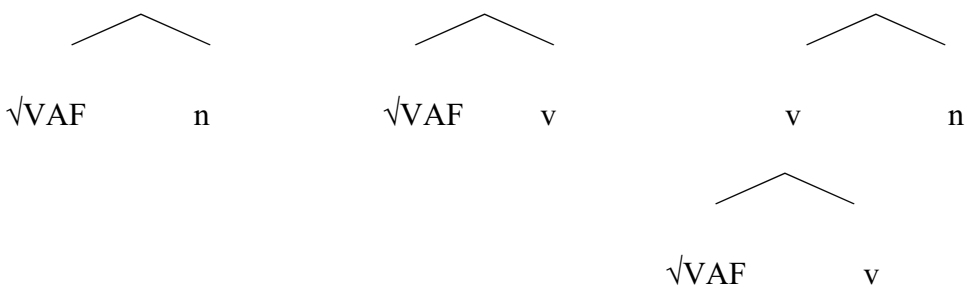
However, the verbs in (10c) behave much like their English counterparts:

(21) a. alipse to tapsi me vutiro
anoint the pan with butter
'She buttered the pan'

b. evapse to prosopo tu me tin kimolia
painted the face his with the chalk
'He painted his face with chalk'

Thus we could argue that unlike (10a) non -m- nouns, (10c) non -m- nouns are cases where both the non -m- noun and its corresponding verb are derived from a common root; of course the -m- noun is derived by the verb:

(22)



This classification gives us three classes. Although I believe that three classes of nominals do exist, it is not clear whether this distinction should be made on the basis of derivational order. A possible and feasible alternative would be to argue that all patterns

include roots that become verbs or nouns, depending on the first head that categorizes them. The verbal complex can then in turn be nominalized via, in some cases, special affixation, -m. The differences we observe concerning interpretation and modification relate to the type of root involved in the structures. Here it is crucial to assume that roots come in different types, see e.g. Levin (2003) (see also the discussion in Harley 2005). On this alternative view, then, all three classes behave structurally alike, and are identical to what we have in (10c). That is, in all cases the first noun, the non -m- noun, is derived by a root, much like the verb that is related to it. The differences that we get have to do with the category of the root. As can be observed, the three patterns are representatives of three distinct root classes. Specifically, (10a) seems to be representative of the roots denoting entities/instruments and states. (10b) seems to represent the class of the so called verbs of preparing, while (10c) seems to contain manner roots. Then, whenever an entity/instrument root is included in the structure, we expect that PP modification will be impossible for the simple reason that the root semantics already contains an entity/instrument. On the other hand, if state or manner roots are involved, then modification is possible.

As I mentioned above, for the purposes of my paper, the crucial point is that the -m- noun is verb derived, and in principle the non -m- nouns in (10) could be root derived much like the corresponding verb. However, if the remarks in the previous paragraph are on the right track, then this suggests that there is something about the meaning of the roots that plays a crucial role in derivational processes.

Summarizing, one criterion that seems to be valid for Greek is that root derived nominals lack special nominalizing morphology (*katharsis* here is an exception). On the other hand, all verb derived nominals do seem to bear special nominalizing morphology,[15] and some of them also contain verbalizing morphology.

[15] An issue arises concerning those nouns that are 'derived' on the basis of stem alternation. As mentioned above, these could be argued to include zero morphology, and stem alternation is then seen as a case for Readjustment

Finally, the different types of nominals, i.e. -m- and non -m- nouns, behave differently when they appear in combination with certain light verbs. Verbs like *throw* are classified as verbs of instantaneous causation of ballistic motion:

(23) a. *rikse mia plisi sta ruha
throw a wash to the clothes

b. rikse ena plisimo sta ruha
throw a washing to the clothes
'lit. wash the clothes'

c. *rikse mia vafi stin porta
throw a paint on the door

d. rikse ena vapsimo stin porta
throw a painting on the door
'lit. Paint the door'

e. *rikse mia katharsi sto domatio
throw a catharsis to the room

f. rikse ena katharisma sto domatio
throw a cleaning to the room
'Lit. clean the room'

g. *rikse mia katastrofi sto hirografo
throw a destruction to the manuscript

The above examples have the form V-Derived Nominal-PP, where the PP introduces the object which will ultimately get cleaned or painted. This is very similar to the indirect object constructions in Greek involving PPs. On the basis of the analysis in Anagnostopoulou (2003), in combination with ideas expressed in Ramchand (2006) and Marantz (2005), we can

---

rules.

take the Greek verb *throw* as being a light verb, instantiating little v, which takes something that is interpreted as a result as its complement. The room/door is the location/possessor of this result. Why a result nominal? According to Levin's (2006) analysis of these verbs, in these constructions an entity impacts a force on a second one. In other words *throw a cleaning to the room* is the equivalent of *throw a stone to John*. Hence it is expected that only those nominals that can have result readings will be licensed in this construction and not those that can only bear simple event readings. As we have seen, only -m- nouns in (10) show this ambiguity. In further support of this, note the ungrammaticality of (23g), involving a noun that can never have a result reading. Now let us see what the above picture suggests for the licensing of AS.

2.3 Relation between form and AS

As far as their behavior with respect to AS is concerned, only the -**m**-forms seem to license AS, the null forms seem not to be able to do so. We clearly do not expect nominals such as *button* which are object nouns to license AS, but nouns such as *wash* and *boil* do not do so either, although they have eventive readings. They behave like referential nominals.

(24) a. to kubi tu paltu /*to kubi tu paltu kratise 10 lepta
the button the-coat-gen the button the coat went on for 10 minutes
'the coat's button'

b. to kuboma tu paltu kratise 10 lepta
the buttoning the-coat-gen went on for 10 minutes
the buttoning of the coat went on for 10 minutes

(25) a. *i plisi tu aftokinitu kratise dio ores[16]

[16] Note that examples such as in (i) and (ii) exist:
(i) tu ekanan plisi egefalu
him did-3pl wash brain-gen
'They brain washed him'

the wash the car-gen took two hours

b. to plisimo ton ruhon kratise dio ores

The washing the-clothes-gen took two hours

The washing of the clothes went on for two hours

c. *i vafi ton malion kratise misi ora

the paint the hair took half an hour

d. to vapsimo ton malion kratise misi ora

the painting the hair took half an hour

Similar observations, as far as AS is concerned, hold for 'de-adjectival' formations.[17] Whenever we have two nominal forms related to the same root, only the form that clearly contains verbal layers is able to license AS:

(26) katharis**m**a katharis**m**os kathar**s**i

a. to katharisma/o katharismos tu ktiriu kratise 5 ores

the cleaning the cleaning of the building took 5 hours

b. *i katharsi tu protagonisti kratise 3 ores

the catharsis the leading actor took 3 hours

c. I katharsi itan anapofehti

The catharsis was unavoidable

On the basis of the above, we can formulate the following generalization (see Marantz 2001 for a more general discussion of word formation processes):

(ii) plisi ruhon 'wash-clothes vafi malion 'paint hair'

However, the above do not contain nominals licensing AS, but they rather behave like compounds, i.e. the genitive and the head noun form together a complex word. Evidence for this comes from the fact that one cannot replace the genitive in these examples with a referential clitic, e.g . **tu ekanan plisi tu* 'him did wash his', *plisi tus 'wash theirs', *vafi tus 'paint theirs'.

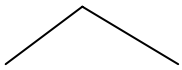
[17] In most cases, the distinction between *-m-a* and *-m-o*s is register triggered, the former being more colloquial than the latter. Apparent lexicalizations exist, e.g. *katharismos prosopu* 'facial cleaning'.

(27) **Generalization:**

The morpho-syntactic properties of nouns suggest that when a nominal affix is attached directly to the root we have negotiated (apparently idiosyncratic) meaning of the root in context of the morpheme and absence of AS. In cases where the nominal affix attaches outside verbalizing affixes, the result is compositional meaning predictable from the meaning of the stem.

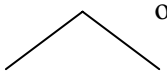
This seems to hold crosslinguistically, cf. Russian (Engelhardt 1998: 128), and is further evidence for the existence of two cycles for word-formation (Marantz 2001):

(28) root-cycle

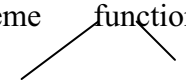


morpheme root

outer-cycle attachment



morpheme functional head



… root…

We will see below that (27) is the correct generalization only as far as the morphology-meaning correlation is concerned, but not for the AS part.

We could then express the conditions on insertion for the vocabulary items as in (29):

(29) a. Spell-out of n: Root Cycle (not exhaustive)

n ↔ -s /___{√KATHAR/CLEAN/ ETC...}

n ↔ - ∅/__{√VAF/PAINT/ ETC...}

b. Spell-out of n: Outer-cycle, i.e. Root + v (at least)

n ↔ -m- /___{√KATHAR/CLEAN/ ETC...}

n ↔ -s- /___{√PL/WASH/ ETC...}

As we saw, what we do find in the Greek data is the following affix-root distribution (cf. Embick's 2003 discussion of participial formation in English):

i) the same root can appear with distinct affixes in different cycles

ii) different roots can appear with the same affixes in different cycles

3. Back to English

Leaving aside the issue of English zero derived nominals for the moment, let us revisit the situation concerning the English nominalization patterns. As stated in section 2.1, -(*a*)*tion* nominals are frequently ambiguous between AS and non AS readings. On the other hand, obligatory licensing of AS is found with verbal gerunds (as in *John's destroying the city*). For these, it is rather uncontroversial that they contain functional layers similar to those of their verbal counterparts. Hence the fact that they license AS does not come as a surprise. In fact since -*ing* in gerunds is not restricted to a particular type of verb, we could refer to it as the elsewhere form (see Harley & Noyer 1998). In Alexiadou (2001) and (2005) I proposed different structures for the two types of English gerunds (verbal vs. nominal as in J*ohn's destroying of the city*) as opposed to -*ation* nominals. Nominal gerunds were viewed as similar to -*ation* nominals, though this is probably a simplification (see Borer 2001). Crucially, verbal gerunds differ from -*ation* nominals in that they contain Aspect, and their AS licensing properties are no different from those of their corresponding verbs. They further differ from -*ation* nominals in that these have mixed internal functional projections, nominal and verbal. Specifically, -*ation* nominals like verbal gerunds contain v; they clearly differ from verbal gerunds in that they lack Aspect. It is not clear whether -*ation* nominals contain Voice, but Alexiadou (2001) argued that such nominalizations are actually intransitive, i.e. they contain a non-transitive/passive Voice, unlike verbal gerunds. An important difference between -*ation* nominals and verbal gerunds concerned the presence of nominal functional layers in the former and the absence thereof in the latter. Specifically, -*ation* nominals contain Number. Number was taken to be the projections that leads to a nominal internal structure and

comes together with a set of nominal internal properties, such as the licensing of adjectives and the availability of pluralization:

(30) a. [DP [Asp [VoiceP[vP √]]] *verbal gerunds*

b. [DP [NumberP [VoiceP [[vP √]]] *nominal gerunds/-ation nominals*

To the extent that an external argument is present in *-ation* nominals and nominals gerunds, this is argued to be a possessor in Spec,DP. The external argument in the case of verbal gerunds, on the other hand, is projected in Spec,VoiceP.

A final note is in order concerning zero derived nominals.[18] For the purposes of this paper, to the extent that these nominals license AS, they are derived in a manner similar to-*ation* nominals and the variation in affixation is treated as a matter of allomorphy.

In the next section I turn to the issue of ambiguity in the nominal system.

4. AS in nominals (or dealing with nominal ambiguity)

As we have already seen, derived nominals are ambiguous. But verbalizing morphology is present in all cases both in English and in Greek.

(31) the verbalization of the concept took a long time *AS*

(32) the verbalization was long *simple event*

(33) to kathar**is**ma tu ktiriu kratise 5 ores *AS*

the cleaning of the building took 5 hours

(34) to kathar**is**ma mas kurase *simple event*

the cleaning us tired-made

The morphological analysis clearly suggests the presence of v. Since the roots contained in these nominals do not carry an event implication themselves, this must come from the structure, namely the presence of v. If event implications arise only via the presence of v, this

[18]As already mentioned the existence of this pattern is problematic for accounts such as Borer's (2001) which argue against zero derivation.

means that all nominal structures that contain v could be interpreted primarily as eventive independently of the licensing of AS. This explains the simple event reading of derived nominals.

What about the result reading of such nouns? At least for Greek, the claim made in Giannakidou & Merchant (1999) is crucial. Giannakidou & Merchant argue in detail that Greek, unlike languages such as English, uses a special set of affixes to form resultatives and as a consequence lacks pure syntactic means to express secondary predication. This is why in Greek the counterpart of *John hammered the metal flat* is ungrammatical. What is important for our purposes is the idea, mentioned already in previous sections, that affixes such as *-iz-* and *-on-* in Greek have eventive semantics. It is interesting to note that these affixes tend to appear on a special set of roots, namely instrumental/entity and stative ones. In combination with a stative or an entity root e.g. as in *katharizo* 'clean' and *ladono* 'put oil' respectively, they will bring about a meaning which is similar to that of secondary predication in English, i.e. namely a result that is brought about by an event (see Giannakidou & Merchant 1999 for details of the semantic composition). Building on this, we can then suggest that this is how the result reading comes about: it is also derived from the same structure. A similar analysis can be conceptualised for the English affixes *-ify-* and *-en-*, and their nominalizations, since the class of verbs containing such affixes do not form secondary predication either, see (35a-35b) from Giannakidou & Merchant:

(35) a. *May simplified the assignment easy

b. *The sunset reddened the clouds scarlet.

These patterns are also discussed in Embick (2004) and the analysis proposed there for participle formation is in a sense similar. A stative root in combination with an eventive affix, FIENT in Embick's terms, can be understood as referring to the result of an action or an event in the nominal domain. In other words, *-ation* nominals are ambiguous between an eventive

and a result reading, because they contain such a v layer. Both the simple event and the result reading (as well as the AS reading) have the same basic structure, containing v in combination with the root, thus being in principle ambiguous (contra Alexiadou 2001).[19] What this suggests is that the availability of the result interpretation will always be dependent on a particular combination of v and the different types of roots. This might explain why certain derived nominals are ambiguous between event and result interpretations, while others are ambiguous between event and object interpretations. The latter contain roots that are not stative, but rather instruments or entities.

In this light, consider again some of the Greek patterns discussed here. A root like √BUTTON simply denotes an entity or an instrument; this root can turn into a verb containing an eventive affix, -on-. This structure can become nominal by adding -m-. The -m- nominal is then ambiguous as predicted between the event and the object reading. The root √CLEAN is stative. It can turn into a verb containing an eventive affix, iz-. This structure can become nominal by adding -m-. The -m- nominal is then ambiguous as predicted between the event and the result reading.

We have seen, however, cases where the verb does not contain a special eventive affix, e.g. *plisi* 'wash'. Recall that the examples in (10b) are representatives of verbs that belong to the class of verbs of preparing, which includes some transformation of the theme argument. As far as I can tell, in this case the non -m- nominals cannot have result/object readings, only purely eventive ones; on the other hand, the -m- noun is ambiguous as predicted. Evidence for this comes from the data in (23).

Finally, for the examples in (10c), i.e. *vafi* 'paint', where a manner root is involved, the reading of the non -m- noun can be a simple event or even an object one, and again, as predicted, only the -m- nouns show an ambiguity between an event and a result interpretation.

[19] Note that for nouns such as *event* or *trip*, the simple event reading is one that does not arise in the context of v, but is derived from the semantics of the root involved.

Note that for the examples in (10b) and (10c), if we assume that the non -m- noun is root derived, we must accept that manner roots or roots related to the preparing class are interpreted rather freely under the first nominal head that categorizes them. The meaning we get is related to the main underspecified meaning of the root, but they are not compositional in the sense that the -m- nouns are.

The above observations clearly suggest that the structure of AS nouns is not really distinct from that of non-AS nouns: both structures contain a root and an eventive v head. Further supportive evidence that this is the correct generalization (contra Alexiadou 2001 and the generalization in (1)) comes from the following facts, observed by Rossdeutscher (2007). Rossdeutscher makes this point for German, but it can be transferred to the Greek and English data:[20]

(36) i viastiki dianomi

the rapid delivery

(37) the rough estimation/the rough measurement

Rossdeutscher observes that in these cases the adjective rapid and/or rough modifies the event of delivering, estimating and measuring respectively, although the nouns themselves have a result/object interpretation. Assuming that event modification makes necessarily reference to

[20] Note that this is a problem, first raised by A. Kroch (pc), that merits further investigation. In examples such as ones in (36-37) an adjective seems to be modifying the event denoted by the noun, very much like the interpretation of *Olga is a beautiful dancer* under the *Olga dances beautifully* reading (discussed in Larson 1998). The issue here is that while we have something with the morphology of an adjective we have an adverbial interpretation. I suggest that adjectival and adverbial morphology should be separated from the interpretative effects of the modifier. If we assume that the nouns in these examples contain a verbal layer, v, we can explain that the modifier can have access to it. The next question is why the modifier shows up with adjectival morphology. Here I will follow ideas expressed in Borer (1993) and Alexiadou (2001: 128f). Borer attributes the ban on adverbial morphology in nominalization to the independent licensing condition that specifies that adverbs are not licensed by lexical projections alone. Alexiadou observes that there is a cross-linguistic correlation between the presence of Aspect and the presence of manner modification. The idea is that the morphology of adverbial (manner) modification requires the presence of Aspect. If Aspect is not present, the modifier surfaces with adjectival morphology, as part of the nominal structure. Note that target state participles offer supportive evidence for this suggestion. Such participles have a structure very similar to that of result nouns, on the view discussed here (see Alexiadou & Anagnostopoulou 2007). The participles, however, can license adverbs. The reason is that participial morphology is the realization of Aspect, i.e. Aspect is present in the participial structure and hence adverbial morphology is licit.

the presence of v, this means that both AS and non-AS nouns, as the nominals in (36) and (37) contain v.

What are the consequences of the above for the licensing of AS? In particular, what accounts for the apparent flexibility of a single root to appear in a variety of AS frames? The general assumption followed here is that AS is associated with structural decomposition. But both AS and non-AS nouns contain v. Note that an approach suggesting that affixes such as -*ation* in English and -*m*- in Greek are underspecified and hence attach at various heights in structure could no longer work. That is on the basis of the results of the previous sections, it cannot be the case that these affixes can attach both directly to the root and at different (higher) layers of structure (again contra Alexiadou 2001). Recall, one piece of evidence comes from the presences of verbalizing/eventive morphology, and a second piece from the interpretative facts involving adjectival modification.

Hence it seems that we need a distinction between layers that introduce arguments and layers that function as simple verbalizers, i.e. may introduce events but not arguments. What we need to identify is the layers that introduce external arguments and those that introduce internal arguments. In principle for AS nouns, these layers should be no different from those of the corresponding verbs (in agreement with Alexiadou 2001 and Borer 2001, to appear).

As has been discussed in the literature, the layers that introduce arguments have special properties. VoiceP is responsible for the introduction of external arguments (overt or covert) and the licensing of a particular set of adverbs as well as agentive PPs (Kratzer 1993).[21] As far as internal arguments are concerned, within DM different avenues have been explored. Alexiadou (2001), following Marantz (1997), took internal arguments to be introduced by the root, and licensed only under specific structural conditions. But other

[21] Note that scholars do not agree as to the layer responsible for the introduction of external arguments (see e.g. the discussion in Alexiadou, Anagnostopoulou & Schäfer 2006, Merchant 2006, Harley 2007, Ramchand 2006). Going into the details of this debate would take us too far afield. In this paper I adopt the analysis in Kratzer (op.cit.) and in Alexiadou, Anagnostopoulou & Schäfer (2006), according to which Voice introduces external arguments.

options have also been proposed. E.g. one could argue that v itself introduces internal arguments (Embick 2004, Giannakidou & Merchant 1999) or other predicates, prepositions and particles are responsible for internal arguments (see Ramchand 2006 for discussion and references). Independently of the source of the internal argument, crucially the presence of verbalizing morphology is not related to AS inheritance.

The observations made above concerning external arguments suggest that VoiceP is special, in that it introduces external arguments, while v is not (see Pylkkänen 2002 for arguments from other domains). The structure-morphology correlation in the nominal domain would then be as in (38):

(38)

	root selecting n	**v selecting n**	**Voice selecting n**
AS	NO	NO	YES
Agent PPs	NO	NO	YES
Event reading	NO/depending on the root	YES	YES
Verbalizing morphology between n and root	NO	Possible	Possible

Hence the crucial thing for the licensing of external arguments is whether nominalizing morphology attaches on top of VoiceP or lower. Now is there any evidence for the presence of VoiceP in nominals? In fact, people have argued that Voice (or a similar projection) is indeed present within the nominal domain.

To begin with, gerunds as shown in (30a) are no different from their corresponding verbs in containing Voice, and this is relatively uncontroversial. For *-ation* type nominals, it has been argued (most prominently by Alexiadou 2001, Borer 2001, Sichel 2007) that these are 'passive', see also the discussion of Catalan in Picallo (1991), of Greek in Alexiadou

(2001) and of Hebrew in Borer (2001). Evidence for this comes from the licensing of certain adjuncts related to Voice and/or the passive as well as the licensing of by-phrases. First of all note that in Greek, verbs that do not form a verbal passive can take an agent PP in the nominalization (this has also been observed for Hebrew). (39c) contains a nominalization of an alternating verb, which receives a passive interpretation when the *by*-phrase is present:

(39) a. to kapsimo tu dasus apo to Jani
the burning the forest by the John

b. to adiasma tu kutiu apo to Jani
the emptying the box by John

c. to alag**ma** ton ruhon (apo to Jani)
the change the clothes-gen by John

There is a strong tendency in interpreting nominals which contain the infix -m- as 'passive', noted in Alexiadou (2001). Taking the licensing of the agentive PP to be a reflex of the presence of Voice, the above suggests that Voice is contained in the structure of the nominals (Alexiadou, Anagnostopoulou & Schäfer 2006).

In (40) an example from Hebrew shows that by-phrases and implicit control into purpose clauses are licensed by the nominal. The argumentation in Borer (2001) goes as follows: to the extent that these phrases are licensed within the nominal domain, they are subject to the same conditions as their verbal counterparts:

(40) ha-hoxaxa Sel ha-te'ana ('al yedey ha-matematika'it) kedey lizkot ba-pras
the proof of the claim by the-mathematician in-order to-win in-the-prize
'the proof of the claim (by the mathematician) in order to win the prize'

Furthermore, in languages like Greek (Alexiadou 2001) and Hebrew (Borer 2001), we find VoiceP related adverbs (agent-oriented adverbs) within derived nominals, and the same holds for the English gerund. S-adverbs, on the other hand, are illicit:

(41) axilat Dan et ha-uga be-minus

eating Dan acc the cake politely

'Dan's eating the cake politely'

Assuming that adverbs are licensed by functional layers only, this is also evidence for the presence of Voice in certain nominalizations.

Finally, note that nominals based on roots like *murder* preferably form argument supporting and passive nominalizations. Such roots need to combine with Voice, due to their 'encyclopedic meaning' (Alexiadou, Anagnostopoulou & Schäfer 2006):[22]

(42) i dolofonia tu Athanasiadi katadikastike apo olus

the murder the Athanasiadis-gen was condemned by everybody

Naturally, (see also Harley this volume), non AS examples of such roots also exist (*a murder*). This relates to the general issue of flexibility in AS licensing within nominals to which I turn in section 5.

In conclusion, AS nominals contain Voice, which is passive (see also Sichel 2007 for a recent discussion). Turning to the licensing of internal arguments, as the presence of Voice only tells us that the structure is interpreted as including an implicit agent, things become less clear. As I said, in principle one could argue that internal arguments are introduced by the root (for a criticism of this view, see Borer 2001). Let me briefly consider some other options here. I begin with the case of the Greek counterpart of *destruction*:

(43) a. kata-str**ef**o katastr**o**fi

destroy *destruction*

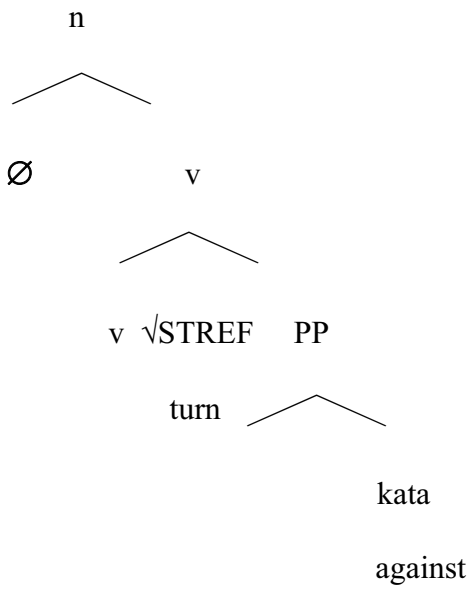
b. i katastrofi ton egrafon kratise 3 ores

the destruction the documents took three hours

[22] For many speakers this also holds for nominals derived from e.g. *destroy* and other necessarily externally caused roots.

Here we have no special nominalizing or verbalizing morphology. We can argue that whenever internal arguments are present, these are licensed by other predicates. Consider the morphological decomposition of the noun:

(44)



Such forms are actually built on the basis of a preposition/adverb and a (manner) root √STREF. The two elements combine very early in the derivation. The overt form is a result of incorporation, see Marantz (2005) for English. Here the presence of an internal argument is related to the lower PP that introduces this argument.

What about the other cases, i.e. the cases such as *katharisma* 'cleaning' and *kuboma* 'buttoning'? Here one can argue that since these forms contain eventive affixes, these introduce the internal argument, as proposed in Giannakidou & Merchant (1999).[23] In other words these affixes have exactly the same status as the PPs and the particles in languages like English (see Ramchand 2006 for a more elaborated discussion on the function of resultative phrases).

Let us now turn to *vrasimo'* boiling' ke *plisimo* 'washing'. As already mentioned, these do not seem to contain overt eventive morphology, but still do express eventive meanings, which in the case of *wash* necessarily needs to be brought about by an external causer. In this

[23] Many thanks to Anastasia Giannakidou for pointing this out to me.

case, AS is licensed only when the verbal structure is available, i.e. in the passive structure for *boil* and *wash*. Finally, the nominals such as *vapsimo* 'painting' show an ambiguity between AS and non-AS readings, which again does not seem to be related to the presence of eventive morphology. As with *boil* and *wash*, the availability of result readings in the absence of FIENT morphology is related to the type of roots that participate in a given word-formation process. As for all these, a v layer is assumed, one could argue that this level introduces the internal arguments.[24] [25]

5. Optionality of AS in the nominal system

The previous sections established the following points: i) we need to distinguish between verbalizers and layers introducing arguments and ii) AS nouns and R-nouns share the same basic verbal structure, i.e. contain v in addition to the root. This in turn means that derived nominals may have a verbal source, but this is not directly linked to their ability to license AS. This view, however, makes the puzzle concerning the flexibility in the licensing of AS in the nominal environment even more complex. Specifically, if we assume that different types of nouns and verbs share a certain structure, what enforces the presence of a fully fledged AS in the clausal domain and a special type of AS (passive) in the nominal one, which, in addition is often optional?

Note of course that certainly English verbal gerunds are not passive. But these nominals do not differ from their corresponding verbs, apart from the fact that the external argument bears genitive Case, something related to the absence of the nominative Case licenser within the DP, namely Tense. In addition for verbal gerunds, AS is never optional.

[24] Alternatively, one could assume that other predicates such as covert PPs are involved (Marantz 2005: on this view *painting of the door* would have structure similar to *painting at the door*), a point which remains here open for further investigation.

[25] A final note is in order here. In all the above cases, -m- attaches to a verbal head. But the fact that the reading somehow still makes reference to the root suggests that -m- attachment is able to see the root even though other heads intervene between n and the root. Hence what remains to be looked at is the exact nature of the restrictions on the attachment of -m-. I leave this for further investigation.

Thus in order to answer the question of optionality we have to consider those nominals that have both AS and non-AS variants. Building on and extending ideas developed in Alexiadou (2001) and (2005), I would like to propose, though in a sketchy manner, that the optionality of AS in the nominal domain has to do with the presence of NumberP or other layers that constitute a nominal internal structure in combination with a particular (aspectual) type of verbal structure. A nominal internal structure is characterized by the presence of nominal functional projections below D. As verbal gerunds occupy DP positions, they contain a DP layer, where '*s* is located. Hence 'externally' they are DPs. A verbal internal structure is characterized by the presence of verbal layers below D. A mixed internal structure contains both nominal and verbal layers and nominals with that structure show a mixed behavior. The main claim here is that these nominals that have a mixed internal structure (verbal and nominal) are those that are ambiguous between AS and non-AS readings (Alexiadou 2007, Iordachioaia & Soare 2007).

The basic observation in support of this claim relies on the availability of pluralization of AS nominals. In table 1 it is stated that AS nominals are taken to be mass nouns, and thus never pluralize, while R-nominals are taken to be count nouns and can pluralize. However, the factual situation is slightly different. A subtype of AS nominals can form plurals, namely telic/bounded nominals can pluralize while preserving their AS.[26] On the other hand, atelic/unbounded AS nominals cannot pluralize, unless they are interpreted as R-nominals in which case they no longer appear with AS. In this respect only atelic AS nominals are similar to mass nouns.

That the aspect of AS nominals plays a role in their ability to pluralize has been noted by Mourelatos (1978) and discussed in Borer (2005) for English, Bierwisch (1989) for

[26] Naturally they can pluralize without AS too, as in (i), where the nominal has the simple event reading:

(i) Man accused of three murders

I mentioned in the previous section that generally nominals derived from agentive roots preserve their argument structure. Examples such as (i), however, contradict this. But on the view developed here, the behavior of these nominals is expected: they partake in structures which have a mixed internal structure.

German, Markantonatou (1992) for Greek.[27] This is shown below with English examples, taken from Borer (2005: 78), (45e) was found in the internet:

(45) a. There were three arrivals of a train

b. There was a capsising of a boat by Mary

c. *There was a pushing of the cart by John

d. There was at least one pushing of the cart to New York by John

e. He caused three murders of witnesses that was suppose to testify at trial

As Borer notes, Grimshaw's generalization is correct for atelic AS nominals, which are akin to mass nouns, but not for telic AS nominals, which are akin to count nouns and thus can pluralize without losing AS. Since the above pattern holds across languages, what we now need to explain is the mass vs. count distinction in connection with atelic derived nominals, and why introduction of plurality with preservation of AS leads to ungrammaticality only in this case.[28]

Following Sharvy (1978), Borer (2005) among others, the distinction between mass and count nouns is a structural one. Let us assume that a projection like NumberP or PlP in Heycock & Zamparalli (2005) or ClassP in Borer (2005) is the projection in which this is realized. In order to approach the issue of AS in connection with the mass vs. count noun distinction, we need to consider the properties plural nominals and mass nouns share. In the literature it has been argued that these share the following two properties: (i) cumulative reference and (ii) homogeneity (see e.g. Krifka 1992). Let us subsume these under the term unboundedness (Jackendoff 1991). Let us then propose that the problem of pluralization of

[27] Note that pluralization of derived nominals has been argued to hold in Romanian by Iordachioaia & Soare (2007) and in French and Italian by Roodenburg (2006).

[28] Note that the fact that telic nominals generally pluralize goes against the hypothesis in Harley (this volume) that pluralization introduces delimitedness, incompatible with an already telic configuration (*the nominalization/*s of two verbs*, where Harley takes the object to measure out the event). Note further that *-ation* nominals are not necessarily telic (Alexiadou 2001 and references therein).

AS nominals has to do with unboundedness. In principle there are at least three mechanisms responsible for introducing (un)boundedness in languages (see also Engelhardt 2000):

(46) a. Pluralization (inflectional feature, introduced via nominal structure)

b. Aktionsart

c. Morphological Aspect

Notions such as Aktionsart and Morphological aspect related to aspectual distinctions such as (a)telicity and (im)perfectivity, see Verkuyl (1993), Borer (2005), Filip (1996), Cappelle & Declerck (2005). All three concepts, unboundedness, imperfectivity, atelicitiy are related, but presumably separate categories. Crucial for current purposes is the generalization in (47): [29]

(47) count nouns are similar to bounded events

mass nouns are similar to unbounded events

If the function of pluralization is to introduce unboundedness, it can apply to structures that are bounded, i.e. telice AS nominals, and introduce unboundedness. For structures, which are already unbounded via Morphological Aspect, realised in AspP, and/or Aktionsart, realised within VoiceP, pluralization would be non-sensical. The case of unboundedness realised in AspP is presumably the case of English verbal gerunds, for which Alexiadou (2005) argued in detail that they are quite special in the sense that they contain AspectP (imperfective) but lack Number. This explains why gerunds lack several of the nominal properties that characterize other derived nominals, e.g. they cannot be modified by adjectives. On the other hand, those derived nouns that contain Number (*-ation* nominals and nominal gerunds) have more nominal properties including the licensing of adjectives and availability of pluralization. The argument here is that since verbal gerunds lack number, not only can they never pluralize but they can never receive an R-interpretation, as crucially their internal structure is not nominal.

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[29] Mourelatos (1978) talks about (im)perfectivity:

(i) perfective events = count quantified
imperfective events = mass quantified

Mourelatos discusses the perfective vs. Imperfective opposition known from e.g. Slavic languages and Greek. See Bennet & Partee (1978), Bach (1986), Krifka (1992) for further discussion.

What happens then with atelic AS nominals? As mentioned above, these are marked as unbounded at the VoiceP level. In this case, pluralization is out for the same reason pluralization of a mass noun is anomalous: it is only allowed if the noun is able to be construed as picking out distinct units.[30] In the case of derived nominals, pluralization is possible only under an R-interpretation, i.e. when no AS is licensed. As known, there is a difference concerning unboundednes in the verbal domain as opposed to unboundedness in the nominal domain: the former makes reference to VPs and not to ‚lexical' items.[31] Since atelic derived nominals are VPs, which are already unbounded, further introduction of unboundedness via nominal pluralization is out. However, the ‚nominal' part can pluralize, in the absence of AS, since it is not unbounded.

Clearly, further research is necessary in order to determine the exact (semantic and syntactic) role of the projections involved in the interpretation of AS nominals and their participation in bringing about unboundedness.

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[30] In syntactic systems such as the ones assumed here, the shift from count to mass is basically reduced to switching on and off the particular projection, i.e. NumberP. It is important to keep in mind that the clash that would arise is a clash negotiated with at the post-syntactic level. That is, I am not appealing to a process of coercion here, I assume that the structure could be formed, but if it contains contradictory information it will be filtered out by the encyclopedia.

[31] See Doetjes (1997) for discussion.

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