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## **Non-active Morphology and the Direction of Transitivity Alternations**

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The topic of this paper is the manner in which transitivity alternations relate to voice morphology. Transitivity alternations are often signalled by the presence of special morphology. In many languages, intransitive verbs participating in the causative alternation show morphology associated with *intransitivization*. This morphology is sometimes but not always present. A long standing question concerns the gaps in its distribution and more specifically, whether its presence is accidental or systematic and if the latter, what are the properties it connects to. A hypothesis that has been entertained in view of this (Hale & Keyser 1997 among others) is that the presence of morphology signifies the *directionality* of the alternation. On this view, when intransitivizing morphology is present, then the transitive is the basic form, and when it is absent, then the intransitive form is basic. In this paper we argue for this view by examining the distribution of non-active morphology in Greek inchoatives.

### **1. The Distribution of Active/Non-active Morphology in Greek**

#### *1.1. Preliminary Facts: The Voice System of Greek*

Greek has two morphological voices: Active and Non-active. Greek verbs have two sets of forms for Active and Non-active voice which are distributed across two tenses (Past vs. Non-Past) and two aspects (Perfective vs. Imperfective). This is exemplified in (1) and (2) for the Active and Non-active forms of the verb *grafo* 'write' respectively:

(1)		<i>Imperfective</i>		<i>Perfective</i>	
	<b>PN</b>	<b>Non-Past</b>	<b>Past</b>	<b>Non-Past</b>	<b>Past</b>
	1s	graf-o	e-graf-a	grap-s-o	e-grap-s-a
	2s	graf-is	e-graf-es	grap-s-is	e-grap-s-es
	3s	graf-i	e-graf-e	grap-s-i	e-grap-s-e
	1pl	graf-ume	graf-ame	grap-s-ume	grap-s-ame
	2pl	graf-ete	graf-ate	grap-s-ete	grap-s-ate
	3pl	graf-un	graf-ane	grap-s-un	e-grap-s-an
(2)		<i>Imperfective</i>		<i>Perfective</i>	
	<b>PN</b>	<b>Non-Past</b>	<b>Past</b>	<b>Non-Past</b>	<b>Past</b>
	1s	grafo-me	graf-o-muna	graf-t-o	graf-tik-a
	2s	grafe-se	graf-o-suna	graf-t-is	graf-tik-es
	3s	grafe-te	graf-o-tan	graf-t-i	graf-tik-e
	1pl	grafo-maste	graf-o-maste	graf-t-ume	graf-tik-ame
	2pl	grafe-ste	graf-o-saste	graf-t-ite	graf-tik-ate
	3pl	grafo-nde	graf-o-ndane	graf-t-un	graf-tik-an

Apart from inchoatives, there are four other syntactic environments in which Non-active morphology appears in Greek. These are illustrated in (3). The first three examples in (3) are cases in which Non-active morphology occurs in an alternation. The fourth case involving the Non-active form, namely *deponent verbs* (Mackridge 1985, Embick 1998), is not part of an alternation. Deponents are transitive verbs which lack active forms altogether. Syntactically, deponent verbs behave exactly like all other transitive verbs syntactically. This is illustrated in (3d), where the deponent verb takes a nominative subject and an accusative object. Coming to the syntactic alternations, passive verbs constitute the first environment (3a). Passive verbs always show the Non-active. Furthermore, Non-active morphology appears with two distinct types of reflexives. The first of these, illustrated in (3b), shows a verb without a direct object in the Non-active with an inherent reflexive interpretation. The second type, illustrated in (3c) shows a transitive verb 'destroy' prefixed with the element *afto*- 'self'. In this case, it is the combination of the element *afto* and the Non-active morphology which is associated with the reflexive interpretation; without *afto* the result is simply a passive. This type is arguably derived by *self*-incorporation (cf. Rivero 1992).

(3)	a.	to vivlio . diavastike ktes	<i>Passives</i>
		the book-nom read-nact yesterday	
		'The book was read yesterday	
	b.	i Maria htenizete	<i>Reflexives</i>
		Mary-nom combs-nact	
		'Mary combs herself'	
	c.	i Maria afto-katastrefete	<i>Self-Reflexives</i>
		Mary-nom self-destroys-nact	
		'Mary destroys herself'	
	d.	metahirizome to leksiko	<i>Deponents</i>
		use-nact-1sg the dictionary-acc	
		'I use my dictionary'	

Note that Greek also shows a type of reflexive in which an overt anaphor is used, and in which the verb shows the Active (Iatridou 1988, Anagnostopoulou & Everaert 1999):

- (4) i Maria katastrefi ton eafto tis  
 Mary-nom destroys the self hers  
 'Mary destroys herself'

The final environment in which Non-active morphology appears is in the causative-inchoative alternation. Non-active morphology is used on the inchoative variants of causative verbs, as is shown in (5):

- (5) a. o Janis ekapse ti supa  
 John-nom burnt-act the soup-acc  
 'John burnt the soup'  
 b. i supa kegete  
 the soup-nom burns-nact  
 'The book/the soup is burning'

On the other hand, the inchoative variants of other causatives preserve Active morphology (cf. (5b) to (6b)):

- (6) a. o Janis adiase ti sakula  
 John-nom emptied the bag-acc  
 'John emptied the bag'  
 b. i sakula adiase  
 the bag-nom emptied-act  
 'The bag emptied'

In languages like English, when we see a verb that can be used transitively and intransitively we classify it as alternating because the intransitive differs from the passive morphologically. Greek presents two complications created by the distribution of Non-active morphology:

(a) Since Non-active morphology is used with *passives* (always) and *inchoatives* (sometimes), it is not always clear whether we are dealing with a transitive verb that undergoes passivization or with a transitive alternating verb which becomes inchoative (cf. 3).

(b) There are many cases in which an intransitive alternating verb can surface with Active and Non-active forms, depending on the properties of the argument with which it is used.

In the next section we look at the distribution of Active vs. Non-Active morphology more systematically.

### 1.2. Four Systematic Cases in the Distribution of Voice Morphology

There are four systematic cases in the distribution of Active vs. Non-active

morphology leading to a further division of Greek alternating verbs into four classes. In the first class of verbs, Active morphology is present on both the transitive and the intransitive variant of the alternating verb. On the other hand, Non-active morphology appears only in the passive. This is summarized in Table 1 and is illustrated in (7):

Table 1

<i>Transitive/Intransitive</i>	<i>Passive</i>
<b>Active</b>	<b>Non-active</b>

- (7) a. o Janis **adiase** ti sakula *Causative*  
 John-nom emptied-act the bag-acc  
 'John emptied the bag'
- b. i sakula **adiase** *Inchoative*  
 the bag-nom emptied-act  
 'The bag emptied'
- c. i sakula **adiastike** apo to Jani *Passive*  
 the bag-nom emptied-nact from the John  
 'The bag was emptied by John'

This is the canonical pattern of de-adjectival verbs. Other verbs that pattern like this are: *stegnono* 'dry', *stenevo* 'tighten', *kathistero* 'delay', *alazo* 'change', *klino* 'close', *anigo* 'open', *ksepagono* 'defroze', *htipao* 'hit'.

In the second class, Active morphology appears on the transitive variant, while Non-active appears on the intransitive and the passive. This is summarized in Table 2 and is illustrated in (8):

Table 2

<i>Transitive</i>	<i>Intransitive/Passive</i>
<b>Active</b>	<b>Non-active</b>

- (8) a. o Janis komatiase to pani *Causative*  
 John-nom tore-act the cloth  
 'John tore the cloth'
- b. to pani **komatiastike** me ton aera *Inchoative*  
 the cloth-nom tore-act with the air  
 'The cloth got torn by the wind'
- c. to pani **komatiastike** apo to Jani m'ena maheri  
 the cloth-nom tore-nact from the John with a knife  
 'The cloth was torn by John with a knife' *Passive*

Other Greek verbs which pattern like this are: *giatrevo* 'heal', *miono* 'decrease', *eksafanizo* 'diminish', *veltiono* 'improve', *diplasiazo* 'double' i.e. non-de-adjectival verbs of change of state.

In the third class, the general pattern is similar to the one just discussed above, i.e. Active morphology appears on the transitive variant and Non-active on the intransitive, as summarized in Table 3a and shown in (9):

Table 3a

<i>Transitive</i>	<i>Intransitive</i>
<b>Active</b>	<b>Non-active</b>

- (9) a. o Janis ekapse to vivlio/ti supa  
 John-nom burnt-act the book-acc/the soup-acc  
 'John burnt the book/the soup'  
 b. to vivlio/i supa kaike  
 the book-nom/the soup-nom burnt-nact  
 'The book/the soup burnt'

At this point, a question arises, namely how do we know that in (8b-c & 9b) the distinction between an inchoative and a passive is real. As is well known, there are tests that can be used to diagnose the presence of a suppressed Agent. It is expected that a passive should be sensitive to these tests, while an inchoative, which is not taken to include a suppressed Agent, should not. For instance, adverbs like *deliberately* are Agent-oriented. As illustrated in (10a), such adverbs cannot co-occur with the intransitive variant of the alternating verbs discussed above, and similar observations hold for the presence of a *by*-phrase in (10b). Hence both examples do not qualify as passives. Given that other intransitive verbs do qualify as passives according to these tests we can conclude that the passive-inchoative distinction in Greek exists, and that morphologically identical forms are divided into different syntactic classes, the passive and the inchoative.

- (10) a. \*i Maria giatreflike epitides  
 Mary-nom healed-nact on purpose  
 b. \*i supa kaike apo to Jani  
 the soup burnt-nact by John

Coming back to the properties of the third class of verbs we have been discussing, in a limited set of cases (with a few arguments), a different pattern arises. The intransitive variant surfaces with Active morphology, as exemplified in (11):

Table 3b

<i>Intransitive</i>
<b>Active</b>

- (11) i fotia kei  
 the fire-nom burns-act  
 'The fire burns'

Other verbs that behave like this are: *katharizo* 'clean', *fotizo* 'lighten', *psihreno* 'cool', i.e.

generally verbs of light emission and weather verbs.

The fourth class of verbs can similarly be divided into two subcases, summarized in Tables (4a) and (4b) and exemplified in (12) and (13) respectively. In this class, Active morphology appears on the transitive and the intransitive when the argument is [-animate], while Non-active morphology appears on the intransitive when the argument is [+animate]:

Table 4a

<i>Transitive</i>	<i>Intransitive</i>
<b>Active</b>	<b>Non-active/Active [-animate]</b>

- (12) a. o Janis leroσε to trapezomandilo  
 John-nom dirtied-act the tablecloth-acc  
 'John dirtied the tablecloth'  
 b. to trapezomandilo leroσε/lerothike  
 the tablecloth dirtied-act/-nact  
 'The tablecloth got dirty'

Table 4b

<i>Transitive</i>	<i>Intransitive</i>
<b>Active</b>	<b>Non-active [+animate]</b>

- (13) a. o Janis leroσε ti Maria  
 John-nom dirtied-act the Mary-acc  
 'John dirtied the Mary'  
 b. i Maria lerothike/\*lerose  
 Mary-nom dirtied-nact/act

In view of the facts discussed above, the question that arises is whether there are any regularities behind the distribution of Active and Non-active morphology in the classes we have just discussed.

According to Embick (1998), voice morphology does not correspond to any syntactically active element. Nact is a morphological feature which is assigned in specific syntactic configurations, and reflects properties of the syntactic environment rather than itself affecting an alternation. The feature [nact] is assigned post-syntactically to the verb when it (or the v-V complex) is not in a local relationship with an external argument. On this view, voice features are properties of Morphology and thus, all occurrences of [nact] belong to the Morphology component. The difference between deponent verbs and passives, reflexives and inchoatives, is that the former are specified for this feature inherently, while the latter are assigned this feature in a particular syntactic configuration. Embick's proposal for the syntactic alternations is illustrated in (14):

## (14) V → V-VOC[NonAct]/ \_\_\_ No external DP argument

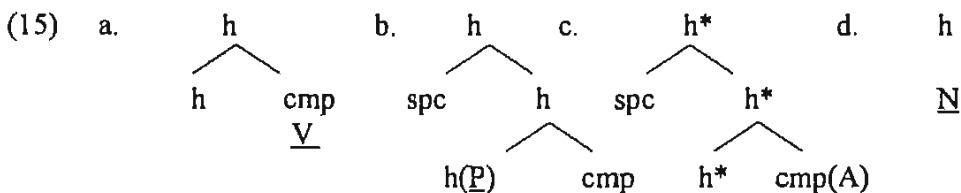
In principle (14) can account for the distribution of Non-active morphology in classes II, III and IV. However, the problem for Embick's account is that not all inchoative variants of alternating verbs appear with Non-active morphology, as we have seen in this section (cf. Class I), and moreover, that the distribution of Non-active morphology in classes III and IV is systematically affected by certain factors.

For this reason, in this paper we pursue the hypothesis that the presence of special morphology signifies the directionality of the alternation (Hale & Keyser 1997, contra Levin & Rapaport 1995 among others, and contra Embick 1998 for Greek). On our view, when intransitivizing, i.e. Non-active, morphology is present, then the transitive is the basic configuration, and the intransitive is formed by reduction (detransitivization). When the morphology is absent, then the intransitive is basic and the transitive is formed by the addition of a head introducing the external argument (transitivization).<sup>1</sup>

Before we enter into the specifics of our proposal we will briefly give an outline of the framework we will be assuming.

## 2. The Basic Elements of Argument Structure: Hale & Keyser (1993, 1997)

According to Hale & Keyser (1993, 1997) the elementary structural types are defined by the fundamental relations in a syntactically represented "argument structure". These relations are taken to be the head-complement and specifier-head. They permit certain lexical structures, but not others. The licit lexical structures are illustrated in (15) below. A head which takes a complement but projects no specifier is called monadic, corresponding to (15a) below, in which *h* represents the head and *cmp* represents the complement. A basic dyadic structure as in (15b), in which *spc* represents the specifier. A third type in which the head projects a structure embodying both the head complement and the head specifier relation as in (15c). These relations also permit a structure that consists of the head alone, as in (15d).



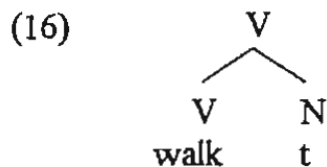
The structural configurations in (15) are neutral with respect to the morphosyntactic category. In English, there is a canonical categorial realization of these heads, as is illustrated under the configurations in (15). Structures (15b) and (15c) look rather similar. However, there is a crucial difference between the two. The canonical categorial realization of the head in (15b) is a relational preposition which establishes a

<sup>1</sup> This hypothesis views Non-active morphology as 'special', and it connects it to derived, i.e. syntactically 'special', verbal forms. As pointed out to us by Janet Fodor, this presupposes a notion of morphological and syntactical 'markedness' which deserves further investigation and needs to be defined in a more precise way. We leave this for future work.

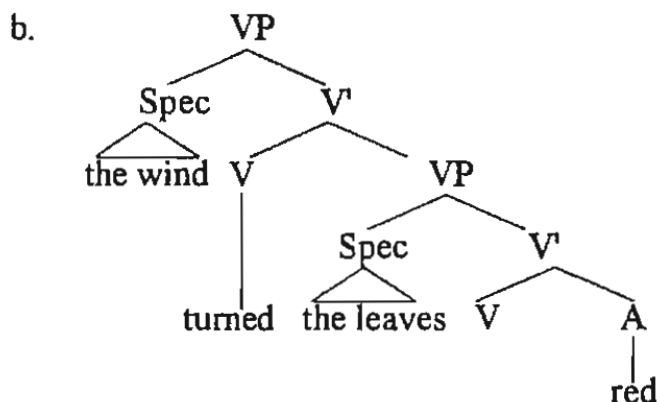
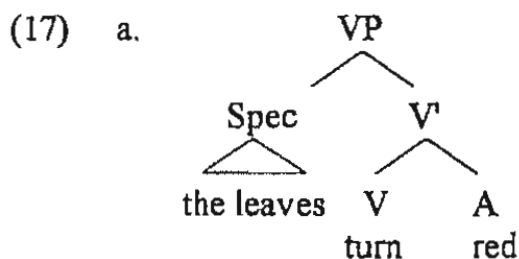


relation between its specifier and its complement. Being prepositional, the *h* in (15b) cannot be directly combined with Tense, and for this reason it needs to be embedded under a verbal head before entering a relation with Tense. On the other hand, (15c) which includes a verbal head that mediates the relation between a predicate and its subject can be directly embedded under Tense.

In this system, unergative verbs are created by a combination of (15d) and (15a):

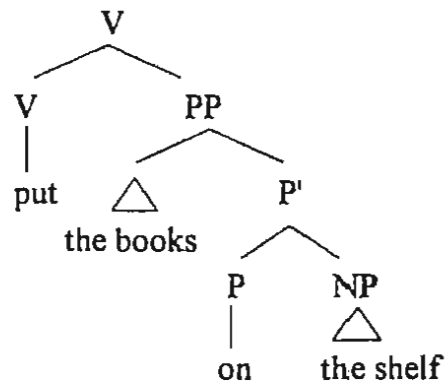


Unaccusatives are prototypically instances of (15c), while causatives are created by a combination of (15c) and (15a), as depicted in (17b):



Finally, location-locatum predicates are created by a combination of (15a) and (15b):

(18)



In this system, location-locatum predicates are basic transitive, while deadjectival verbs are basically intransitive.

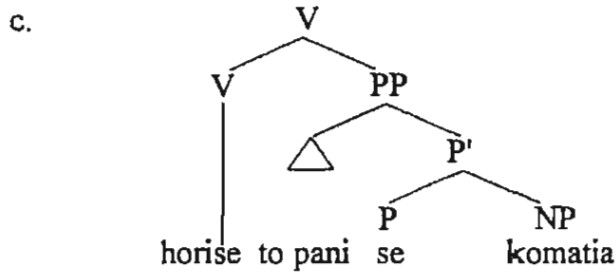
Let us see now how these structures can help us account for the distribution of voice morphology in Greek in determining the directionality of the alternation, i.e. whether the process involves de-transitivization or not.

### 3. Analysis

**Class (I)** verbs fall directly under Hale & Keyser's de-adjectival treatment. The canonical direction is *transitivization*, i.e. introduction of a higher head that introduces the Agent (cf. 17b). Hale & Keyser's schema directly predicts that de-adjectival verbs will not show detransitivizing morphology, a prediction borne out in Greek. The fact that these verbs do not show special morphology of the de-transitivizing type is, on this analysis, not a coincidence. The next step would be to look at the distribution of this kind of 'irregular' detransitivizing morphology in languages other than Greek in order to see whether a similar situation can be observed in other languages as well.

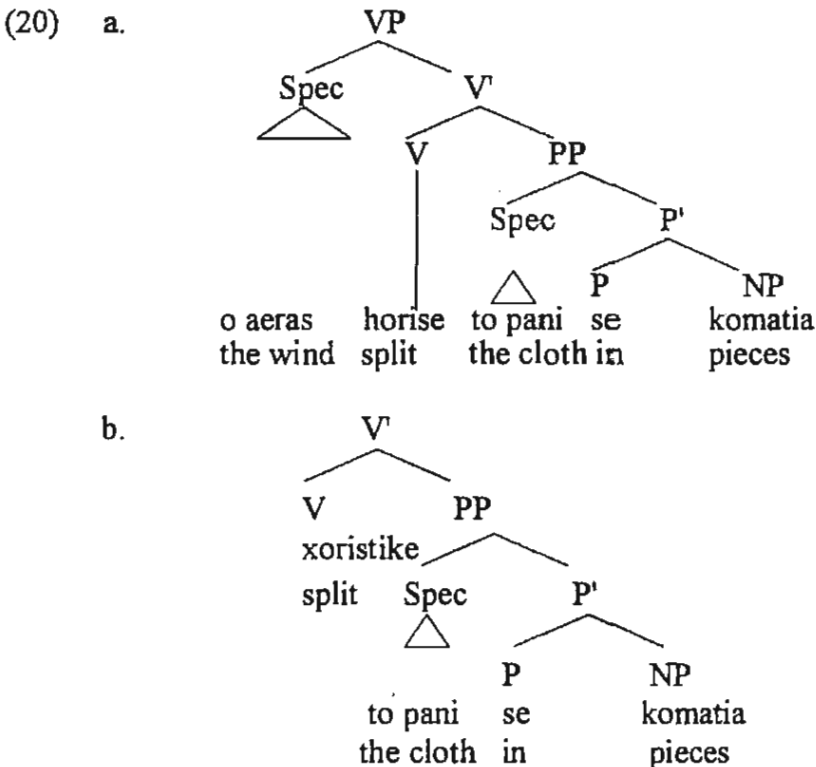
**Class (II)** verbs must be treated as basically transitive. They are built on (15b) which must be embedded under a verbal head because P cannot directly merge with T. This analysis is supported by the fact that several of the verbs of class (II) have counterparts with informationally simpler verbs combining with overt PPs, as shown in (19):

- (19) a. o Janis komatiase to pani  
 John-nom tore-3sg the cloth-acc  
 'John tore the cloth'
- b. o Janis horise to pani se komatia  
 John-nom split-3sg the cloth-acc in pieces  
 'John tore the cloth in pieces'



The forms *horizo se komatia* and *komatiazō* are related by 'conflation', the process that produces synthetic forms. First, N is merged and conflated with P, and then the outcome of this process is conflated with V.

The intransitive variant of class (II) verbs is formed through *detransitivization* signified by the presence of Non-active morphology. Non-active morphology in this case signals that a basic transitive verb becomes intransitive. In other words, it signals the fact that the Agent is not projected, which is what Embick's view of Non-active morphology is. This echoes Williams' (1981) intuition that morphological processes affect (in our terms: reflect changes of) the thematic structure. This is schematically represented in (20):



For **Class (III)** verbs, the existence of an inchoative Non-active suggests that the same derivation must be assumed. As for the limited cases where active morphology appears on the intransitive, we propose that they belong to a different lexical entry, that of an unergative verb. When these verbs are used with 'special' arguments they are unergative by two criteria:

(a) they cannot undergo the causative alternation:

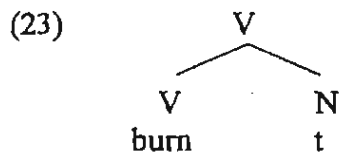
- (21) \*o Janis ekapse ti fotia  
 John-nom burnt-act the fire-acc  
 'John burnt the fire'

(b) they cannot form adjectival passives:

- (22) a. \*i fotia ine kameni  
 the fire is burnt

vs. b. to vivlio ine kameno  
 the book is burnt

Unergative verbs are basic (cf. (16) above and the representation in (23)) and thus the absence of special morphology is entirely expected.



Under the analysis in (23), the fire has an inherent property that causes/does a 'BURN' (cf. Levin's and Rapaport's notion of 'internal causation'), it does not undergo a change of state (unlike, e.g. the soup).

Finally coming to **Class IV** verbs, the existence of an inchoative active form suggests a representation similar to Class (I). The Non-active morphology is obligatory only when the single argument is animate, which means that in this case Non-active morphology is sensitive to the presence of the feature [+animate/+ volitional].

That there is a systematic connection between the distribution of non-active morphology and animacy/volition in Greek is evidenced by the fact that almost all intransitive variants of psychological predicates surface with this morphology:

- (24) a. o Janis stenahorithike  
 John-nom upset-nact-3sg  
 'John got upset'
- b. o Janis provlimatistike  
 John-nom puzzled-nact-3sg  
 'John got puzzled'
- c. o Janis lipithike  
 John-nom sad-nact-3sg  
 John got sad

Note that verbs that are standardly classified as inherent reflexive verbs in Greek,

necessarily have Non-active morphology and they take animate arguments (cf. 3b). In the literature, there are two main proposals for inherent reflexive verbs. On one view, inherent reflexives have unaccusative syntax (cf. Marantz 1984, and Embick 1998). On this view, the active form would be the unaccusative variant of the causative, while the non-active form would be derived according to Embick's formula (cf. 14). On the second view, we could maintain the traditional view that unaccusatives and reflexives are distinct and assume that in unaccusative verbs the external theta-role is absent, while in reflexive verbs the internal theta-role is suppressed. In fact Reinhart (1997) proposes that the same mechanism of role reduction is used in both cases (unaccusatives and reflexives) and that there is a restriction according to which a role that is specified [+mental state] cannot be reduced:

(25) *Reduction* (Reinhart 1997: 13)

- a.  $\underline{V}(\theta_1, \theta_2) \rightarrow R(V)(\theta_n)$   
 b.  $R(P)(x) \rightarrow P(x, X)$

(26) *Role Features*

	Agent	Causer
Causing change	+	+
Mental state involved	+	-

Note that non-animate arguments in Greek can also surface with Non-active morphology (cf. (11b)).<sup>2</sup> These verbs should be treated as inherent reflexives as well. In languages like Dutch and German there are non-animate arguments that can surface as single arguments of inherent reflexive verbs.

(27) De suiker heeft zich opgelost  
 the sugar has itself dissolved  
 'The sugar dissolved'

To assume that inherent reflexives of the type found in Greek or Italian are produced by a mechanism of suppression of the internal theta-role has the problem that it cannot deal with the unaccusative syntax of such predicates, which is signalled by the fact that in languages like Italian such predicates select auxiliary *be* while in Greek they form adjectival passives, as shown in (28):

<sup>2</sup> There is an aspectual difference between Non-active verbs combined with non-animate arguments and their Active counterparts. When the Non-active is used, the non-animate argument is interpreted as being totally affected by the action/change of state denoted by the verb. When the Active is used then the argument is only partially affected. For example, the cloth has become totally dirty when it combines with the form *lerothike* (dirtied-Non active) while it is only partially dirty, i.e. dirty in one particular spot, when it combines with the form *lerose* (dirtied-Active). This is, of course, very interesting and needs to be taken into consideration. Apparently, a similar fact can be found in Dutch with inherent reflexive forms which combine with non-animates (Marcel den Dikken, personal communication). We thank Bill McClure for making us aware of these facts and for discussing them with us.

- (28) i Maria ine tsalakomeni  
Mary-nom is crumbled

The issue requires further research which is beyond the scope of this paper.

#### 4. Conclusion

In this paper we have connected the presence of Non-active morphology to the process of *detransitivization* which can be either passivization, or reflexivization, or suppression of an external cause argument (Levin & Rapaport 1995) of an inherently dyadic alternating verb.

All these processes involve 'suppression' of an external argument, but the agent theta-role is present in the structure in passives (cf. the adverb test discussed above), the feature [+animate/+volitional] is still present in reflexives (interpretation/structure), while the suppressed causer argument is not active in any syntactic sense.<sup>3</sup>

Like Embick we do not attach any syntactic significance to the pieces of morphology. Unlike Embick, however, we consider the presence of morphology not as a 'sign' of NP-movement, but rather as a 'sign' that a certain form is derived. In other words, we make a crucial distinction between unaccusative and transitive basic forms. On our view, Embick's formula in (14) is valid for the latter set of cases, but not for the former.

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<sup>3</sup> Why is that? Perhaps because a volitional argument that controls an event cannot be omitted because it is initiating the causing event, i.e. the event cannot take place without this volitional argument, and this volitional argument is not identified with the causing event. On the other hand, a Cause argument is identical to the causing event which is anyway represented by the presence of the v, and the causer, when present, is merely specifying further the cause event.

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