

Where is non-active morphology?

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1 Introduction

As Anderson (1982) stated, it is appropriate to recognize, internal to the theory of grammar, a field of study concerning itself with the shape and internal structure of words, namely morphology. However, among linguists there is a lot of disagreement concerning the interaction between morphology and phonology or syntax and most importantly with respect to the question whether the syntactic and the word formation components should be completely separated from each other or not. Consider, in this light, passive formation. Wasow (1977) put forth the proposal that we need to distinguish between two types of passive formation: adjectival passive formation takes place in the lexicon, while verbal passive formation takes place in the syntax. This difference in the locus of application of passive formation is reflected in a number of differences between the two processes: lexical operations, such as adjectival passive formation, are idiosyncratic in form and meaning, while syntactic operations, such as verbal passive formation, have basically no exceptions and are productive.

The examples in (1) and (2), from Wasow (1977), provide evidence for this distinction. As shown in (1), adjectival passives can have idiosyncratic meaning (1a), and appear in idiosyncratic form (1b), while this is not the case for the verbal passive in (1c):

- (1) a. the hung jury (= a jury that cannot agree upon a verdict)
b. the shaven man
c. John was being shaved

Moreover, as Wasow noted, not all verbs can form adjectival passives; some verbs can form such passives only if accompanied by an adverb, see (2):

- (2) These specimens look *(recently) found

While in the recent literature this partition has been challenged, see e.g. Embick (2004), Kratzer (2000), Anagnostopoulou (2003) among others, differences in word formation processes such as the above led other researchers to propose a similar partition. For instance, it has been proposed that thematic operations, which affect the argument structure of a verb (e.g. passivization, reflexivization etc.) are parametrized in the following sense: in some languages they are allowed to apply in the lexicon, while in others they can apply in the syntax, see (3), from Reinhart & Siloni (2005). When a process takes place in the lexicon, it is accompanied by lack of productivity, and semantic non-transparency, in a manner to be made precise below:

- (3) UG allows thematic operations to apply in the lexicon or in the syntax

As Reinhart & Siloni (op.cit.) argue, there are languages such as Hebrew and Hungarian whose parameter is set to lexicon, while there are languages such as French whose parameter is set to syntax, but see Doron & Rappaport Hovav (2009) for critical discussion.

The main focus of this paper is to discuss the complex interaction between morphology and thematic operations that are associated with argument structure alternations, such as verbal passivization, and dispositional middle formation. As has been discussed in the literature, languages differ with respect to the properties of these two operations in precisely the ways that can be taken as evidence for the parameter in (3), i.e. in terms of productivity and semantic non-transparency. I will discuss these differences here by looking at data from Semitic, Greek, and English. I will offer an alternative explanation that dispenses with (3), crucially following the line of argumentation in Marantz (2001), Embick (2004), and Anagnostopoulou (2003). In the last section, I will discuss the case of deponent verbs, a case that represents a mismatch between form and function. The rather idiosyncratic behavior of deponents led several researchers to assume that these are special, and should be somehow listed, thus providing further evidence for word formation processes that take place in the lexicon.

2. Verbal passivization

In this section, I will look at the properties of verbal passivization in languages such as Greek, dialects of Arabic and Hebrew. While in languages such as English and German nearly all transitive verbs can form a passive variant, passive formation is restricted in Greek, and in certain Arabic dialects. In Hebrew, we find a very complex interaction between agency and Voice, which I will briefly summarize relying on Doron's (2003) description and analysis. What will become clear from this discussion is that we can distinguish between two types of languages: languages like English, German and Standard Arabic show productive and semantically transparent passivization. The same holds for the causative and the intensive verbal template of Hebrew. In contrast, Palestinian Arabic, Greek, and the simple template of Hebrew have what we can call an underspecified Voice (see Embick 1998). In these languages, the particular morphology used to mark intransitive variants is not uniquely associated with passive semantics, but can also be used for the formation of reflexives and anticausatives. In addition, it can be used on basic entries as well, i.e. to build intransitive entries in the absence of a transitive counterpart (deponent verbs). All these facts point to the conclusion that the mechanisms that form passives in the former group of languages differ significantly from those available to the latter group.

I will discuss data from two dialects of Arabic first and then turn to Greek. The discussion of the Hebrew Voice system will show that both

processes identified in Arabic and Greek can co-exist in a language.

2.1 Verbal passivization in Semitic

According to Laks (2009), Semitic languages differ in terms of productivity of the formation of passive verbs and their distribution. For instance, passivization applies productively in Modern Standard Arabic (MSA): it is possible to form a passive counterpart for every transitive verb, as in English. Passive formation is regular and is performed by melodic overwriting, which can be described as follows: the vocalic pattern of a transitive verb changes into u-i and u-a in the perfective and imperfective verbs respectively, as shown in (4).

- (4) kasar 'break'
Passive: kusir 'break-perf.' yuksar 'break-impf'

In MSA, the formation of verbal passives is exception free. More importantly, however, MSA passive verbs have an exclusive passive meaning. This means that the forms with the vocalic patterns just illustrated do not host any other types of predicates, e.g. reflexives and anticausatives.

In contrast, according to Laks (2009), in Palestinian Arabic (PA), passivization is possible only if the verb is formed in two templates, fa^aal, and fa^oal. The process involves adding the prefix in- or t- to the active verb respectively:

- (5) a. katab inkatab 'write'
 b. barra tbarra 'buy'

Passivization in PA is not entirely productive even within these two templates; there are transitive verbs that do not have passive counterparts for no apparent reason, see (6):

- (6) wajad *inwajad find
 mawwal *tmawwal finance

Unlike in MSA, the same form can be used with a number of meanings, i.e. the Voice system of PA is underspecified in Embick's (1998) sense: as Laks notes, the tfa^oal template can be used in reflexive and anticausative construals, while the infa^aal template is primarily used for passive and anticausative predicates. Both templates can host basic entries/deponent verbs, i.e. predicates that do not have a transitive variant:

(7)	<i>Anticausatives</i>	<i>Reflexives</i>	<i>Basic entries</i>
	twassax 'get dirty'	txabba 'hide oneself'	traddad 'hesitate'
	infarad 'be unique'		

As Laks states, there are many verbs in other templates, which have no passive alternates, for morpho-phonological reasons, as shown in (5). As he argues, forming a passive verb would involve a very complex morpho-phonology, which cannot be handled by the phonological component and is therefore blocked. This is, in his analysis, precisely the type of restriction that can apply in the lexicon. In contrast, when operations that apply in the syntax, the morpho-phonology is transparent and is less subject to constraints, see the MSA data above.

(5)	istafraj	'extract'
	intaqad	'criticize'
	tbanna	'adopt'
	abt'al	'cancel'

Thus, Laks (2009) concludes that passive verbs in PA are derived directly from their active variants in the lexicon by applying word formation rules on existing words, when the application is possible. When the application is impossible, however, no passive verbal form is built. In contrast, passives in MSA are built in the syntax and every transitive verb can have a passive counterpart.

Laks's description leads to the following general conclusion: there is crosslinguistic variation also in the area of verbal passive formation. In some languages, passive morphology is directly linked with a passive interpretation, MSA, but also English and German being cases in point, while in other languages the morphology that is used in verbal passive formation can be found in other semantic-/syntactic environments, e.g. reflexives, anticausatives but also deponent verbs. Due to the lack of transparency, the low productivity and irregularity associated with the latter group, we could hypothesize, as Laks did, that their thematic operations are lexical.

2.2 Verbal passivization in Greek

The picture that Laks describes for PA is also found in Greek, see Tsimpli (1989), Embick (1998), Alexiadou, Anagnostopoulou & Schäfer (to appear) for discussion and references. In Greek, passive formation is synthetic as in Arabic. The language has two Voice paradigms, namely Active and Non-Active Voice. Passive verbs are built on the basis of non-active Voice, (9b).

(8)	Active	Non-Active	
Imperfective	graf-o	grafo-me	write
Perfective	grap-s-o	graf-t-o	

- (9) a. O Janis egrapse to vivlio
John wrote the book
- b. To vivlio graftike apo to Jani
the book wrote-NAct-3sg by John
'The book was written by John'

To begin with, it has been noted that in Greek, there are many verbs that do not passivize, although their counterparts in English and German are perfectly passivizable. For instance, as Zombolou (2004), Alexiadou, Anagnostopoulou & Schäfer (to appear) report, most change of state verbs, but also several other verb classes cannot form a passive, see the list in (10):

- (10) haidevo 'stroke', tsimbao 'pinch', frondizo 'take care of', derno 'beat',
klotsao 'kick', skotono 'kill', kovo 'cut', maherono 'stab', spao 'break',
kriono 'cool', vatheno 'deepen', kondeno 'shorten', makreno
'lengthen', alazo 'change' etc.

Similar to what we saw above for PA, Alexiadou, Anagnostopoulou & Schäfer (to appear) report that in several cases passive formation is out due to morpho-phonological constraints. As shown in (11), in some cases, a phonological clash results from the combination of a particular stem with the non-active affix:

- (11) **kontinlike* 'shortened-NAct'
**leptinlike* 'thinened-NAct'
**makrinlike* 'lengthened-NAct'

Crucially, however, passive formation in Greek is non-transparent. In other words, like in PA, NAct is used in a variety of environments, namely it is found with certain anticausatives, dispositional middles, all reflexives, and deponent verbs, see Tsimpli (1989, 2006), Embick (1998), Alexiadou & Anagnostopoulou (2004), Zombolou (2004), Alexiadou & Doron (2012), Alexiadou, Anagnostopoulou & Schäfer (to appear) among others:

(12) <i>Anticausatives</i>	<i>Reflexives</i>	<i>Deponents</i>
<i>gremistike</i>	<i>plithike</i>	<i>metehiristike</i>
collapsed-NAct-3sg	washed-NAct-3Sg	used-NAct-3sg
<i>kaike</i>	<i>ksiristike</i>	<i>erhete</i>
burned-NAct-3sg	shaved-NAct-3sg	come-NAct-3sg

The class of deponent verbs will be discussed in section 4. Note here that, like in PA, some Greek deponents have no transitive counterpart, like ‘come’, while, unlike in PA, others have a transitive syntax (13); transitive deponents do not feed passivization and constitute a rather different puzzle from their intransitive counterparts.

- (13) O Janis metahiristike to leksiko
 John used-NAct-3sg the dictionary-acc
 'John used the dictionary'

Finally, while in English the external argument of the active transitive sentence can be realized as a *by*-phrase in the passive, *by*-phrases are severely restricted in Greek, either considered marked or only possible if the DP in the *by*-phrase is non-specific, see Philippaki-Warbuton (1975), Laskaratou & Philippaki-Warbuton (1984), Zombolou (2004).

- (14) a. O Petros ekapse to spiti
 Peter burnt the house-acc
 Peter burnt the house
 b. to spiti kaike (*apo ton Petro/?apo tus embristes)
 the house burnt-NAct by the Peter/by the arsonists
 The house was burnt by Peter/by the arsonists'

All these facts led to the proposal that passives in Greek are lexical and not syntactic, see e.g. Smyrniotopoulos (1992). Authors such as Klaiman (1991), Kaufmann (2004), and Manney (2000) argue in fact that Greek lacks a designated passive Voice, it actually only has middle Voice. Middle Voice subsumes a variety of readings, Kemmer (1993), unlike passive Voice. From the perspective of these authors, Middle Voice formation takes place in the lexicon, but see Alexiadou & Doron (2012), Spathas, Alexiadou & Schäfer (2013) for alternatives; thus not only does it derive intransitive verbs from transitive variants, but it can also apply to basic entries.

2.3 Two Voice heads

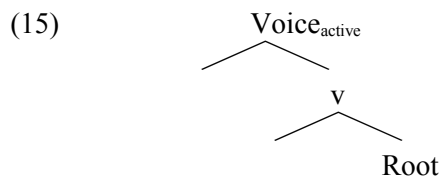
The description of Semitic and Greek verbal passive formation makes clear that the two processes are very different, this being the main reason why a lexical rule has been proposed to deal with verbal passives in PA and Greek, while MSA passive formation is seen as syntactic. The question that arises is whether we are able to offer an explanation of this empirical picture that is couched within a framework that assumes that verbal meaning is compositional and, more importantly, that there is no lexicon vs. syntax division. I will offer such an account in this section.

From the perspective of the framework of Distributed Morphology, a

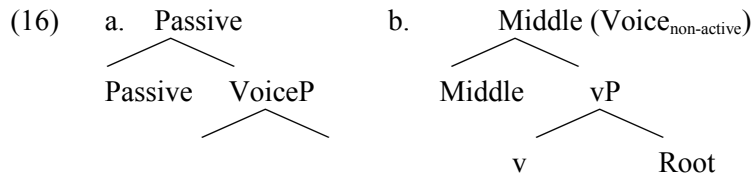
piece-based, realizational theory of morphology, it has been proposed that we can reconstruct the two places, syntax vs. lexicon, for word formation without assuming two places, and in particular, without assuming a Lexicon. Marantz (2001) and Embick (2010) argue that this is possible, if we introduce a distinction between operations and the domain in which these apply, both structurally (position in the syntactic tree: high vs. low) and derivationally (involving what is called cyclic domains). According to Marantz (2001), the uniformity of morphophonology follows from the interpretive nature of the morphophonology, which uniformly follows the syntax. The uniformity of compositionality follows from having the syntax perform all merger operations.

Assuming then that there is only one generative component, namely syntax, the restrictions associated with passive formation are related to the type of head involved in the formation of verbal passives across languages. I argue, building on Alexiadou & Doron (2012), Alexiadou, Anagnostopoulou & Schäfer (to appear) and Spathas, Alexiadou & Schäfer (2013), that there are two heads implicated in argument alternations of the type discussed here: a low one, called here middle, and a high one, passive. While the type of the characterization that I will offer here does not correspond to the characterization offered in these works, it will be sufficient to account for the cross-linguistic differences discussed in the previous sections.

In Distributed Morphology, word formation processes make use of the following units: roots, and functional morphemes, e.g. categorizing heads (*v*), the projection introducing the external argument (Voice), Aspect, Tense, etc. It is generally assumed that external arguments are introduced above these categorizing heads. Kratzer labels this projection Voice (1996). Voice is a cyclic head in the sense of Embick (2010): it determines a special domain for interpretation and allomorphy.



Following Alexiadou & Doron (2012), see also Bruening (2012), Alexiadou, Anagnostopoulou & Schäfer (to appear), and Spathas, Alexiadou & Schäfer (2013), I assume that there are two distinct non-active heads implicated in argument alternations, passive and middle (Doron 2003). Passive attaches outside the domain that introduces the external argument and thus has as its input a transitive structure. This is the case in English (and German), Bruening (2012), cf. Collins (2005). Middle is located lower, i.e. it is the non-active counterpart of *Voice_{active}* in (15), cf. Marantz (2013), see (16):



Languages such as English, German, and MSA are alike in that their passive merges high, it is above the projection that introduces the external argument. In other words, in languages of this type passive is an operation on an active transitive verb phrase, and it derives passive VPs, see also Merchant (2013). PA, and Greek, on the other hand, as well as other languages of this type, lack this head. Their verbs (v+ root) combine only with middle Voice. For Greek, in particular, this Voice head will be realized as non-active morphology, as in the absence of a specifier in Voice, which is the case with all intransitives, this head is spelled-out non-active (Embick 1998). A structure such as the one in (16b) is thus underdetermined for the semantic interpretation it can receive: as Spathas, Alexiadou & Schäfer (2013) argue, depending on the type of root included, it can yield a reflexive or a passive interpretation. More importantly, however, this structure is not dependent on there being a transitive entry, as is the case with the structure containing passive Voice. Since this structure is underspecified, speakers are relatively free to choose an interpretation that would go along with it. In addition, since (16b) forms a spell-out domain, we expect morpho-phonological restrictions to occur: the spell-out of Voice, a phase head, will be sensitive to the type of v-root complex that appears in its complement domain.

From this perspective then, what is subject to parametric variation is the availability of a passive head across languages: English, German, and MSA have such a head, while PA and Greek do not. Importantly, however, these two heads can both be present in a language. A case in point is Hebrew, where we find a complex interaction between agency heads and Voice, illustrated in (17) based on Doron (2003). In Hebrew, each root can appear in combination with three types of verbal template, namely the simple, the intensive and the causative one. These all affect verbal meaning in important respects, relating to the interpretation of the external argument, which will not be discussed here. These three templates can appear in three Voice templates, active, middle and passive. As can be seen in (17), taken from Doron (2030), the simple template has lost its passive Voice, while the causative one its middle Voice:

(17)	root	[p][n][y]	'face'	
		active	passive	middle
a. simple		[p]a[n]a[]	--	ni[f][n]a[]
		<i>to face/ turn (intrans.)</i>		<i>to turn oneself</i>

b. intensive	[p]i[n]a[] <i>to evacuate</i>	[p]u[n]a[] <i>to be evacuated</i>	hit[p]a[n]a[] <i>to vacate/evacuate oneself</i>
c. causative	hi[f][n]a[] <i>to turn (trans.)</i>	hu[f][n]a[] <i>to be turned</i>	--

What is of interest here is the interpretation of these combinations. As Doron (2003) notes, middle morphology (realized as either of the two middle templates *simple middle* and *intensive middle*) marks both anticausatives and reflexive verbs. There is no single causative-template verb interpreted reflexively.

(18)

simple:

[d][x][p] [d]a[x]a[f] *push* ni[d][x]a[f] *push oneself*

intensive:

[s][b][n] [s]i[b]e[n] *soap up* his[t]a[b]e[n] *soap up oneself*

In the simple template, the middle can have a passive interpretation, see (19), from Alexiadou & Doron (2012):

- (19) a. ha-mexonit nimxaca (al-yedey ha-masa'it).
 the car squash.SMPL.MID by the truck
 'The car was squashed (by the truck).'
- b. ha-nisuy hitbacea' (al-yedey ha-xoqer).
 the experiment perform.INTNS.MID by the researcher
 'The experiment was performed (by the researcher).'

In the intensive template, the passive yields a passive only interpretation, see (20), again from Alexiadou & Doron (2012), and it cannot be interpreted as e.g. anticausative as the *by-itself* phrase is out, (20b).

- (20) a. ha-gader porqa al-yedey ha-mafginim.
 the wall dismantle.intns.pass by the demonstrators
 'The wall was dismantled by the demonstrators.'
- b. *ha-gader porqa me-acma.
 the wall dismantle.intns.pass from itself
 'The wall was dismantled by itself.'

Thus in the intensive template, a passive interpretation arises only in the context of passive morphology.

3. Dispositional middle formation

In the previous section, I established that languages may differ as to whether

or not they contain a passive Voice head, next to the active Voice head. Some languages simply make use of the non-active variant of the active Voice in (15), Greek, and PA being cases in point. With this in place, let us now turn to some differences in the domain of dispositional middles between English and Greek, and see whether we can derive them from the fact that Greek only has structure (15b) to build intransitive forms that bear non-active morphology.

As is well known, dispositional middles do not behave syntactically in a uniform way across languages, although they form a unified semantic class. In English, as Ackema & Schoorlemmer (1994) have shown, they exhibit properties of unergatives. On the other hand, in Greek, middles are formally identical to passives, i.e. they are unaccusative predicates, Lekakou (2005). I argue, in the spirit of Alexiadou & Doron (2012), that this is the case as in this language dispositional middles involve structure (16b), i.e. the same one as the passive. In contrast, in English dispositional middles make use of the structure in (15), i.e. they use an active Voice head.

There is ample evidence that dispositional middles in Greek are akin to unaccusative predicates. First of all, similar to passives, they tolerate *by* phrases (Tsimpli 1989, Lekakou 2005):

- (21) afto to vivlio diavazete efxarista (apo
 this the book read-PASS-IMPERF-3SG with-pleasure by
 opiondipote)
 anyone
 ‘This book reads with pleasure by anyone’ [lit.]

This is not the case in English:

- (22) *Plates break easily by John.

Second, unaccusativity diagnostics point to the conclusion that middles are unergative in English, while they are unaccusative in Greek. For instance, prenominal modifier formation is out with dispositional middles in English:

- (23) *the easily bribing men

In contrast, possessor sub-extraction, a test that diagnoses unaccusative predicates in Greek (Alexiadou & Anagnostopoulou 1999), is fine with dispositional middles in this language (Lekakou 2005):

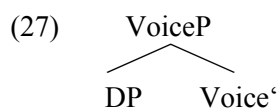
- (24) tinos vleponde i tenies efkola
 whose see-NONACT.IMPERF.3PL the-NOM film-NOM.PL easily
 Whose movies watch easily?

In agreement with Lekakou (2005) and Condoravdi (1989), I assume that

middle is a semantic category and its syntactic realization differs across languages. In languages like Greek, middle makes use of the same non-active Voice head that passives and reflexives use. As a result, it has an unaccusative syntax. In languages like English, middle bears active morphology and it has an unergative syntax. Following Lekakou, the semantics of middles are licensed by imperfective morphology in Greek, which English lacks. As Lekakou argues, a language will employ a passive/unaccusative structure for the middle interpretation if and only if genericity is encoded in imperfective morphology. The definitions in (25)-(26) are from Lekakou (2005):

- (25) A language encodes genericity in imperfective morphology iff in at least one tense it has two distinct verb forms for generic and nongenerics uses, i.e. iff genericity \rightarrow imperfectivity.
- (26) Middle interpretation = the ascription of a dispositional property to the Patient/Theme argument.

From Lekakou's perspective, dispositionality is subject-oriented genericity. This way Lekakou derives the genericity of the otherwise eventive verb and the obligatorily generic interpretation of indefinite subjects of middles. According to Lekakou, for the disposition ascription to target the patient/theme argument, this has to appear in subject position. In English, it appears in Spec, VoiceP, (27), and as a result dispositional middles behave like unergative in this language.



This explains why no *by* phrases can appear in English middles. This structure will be the input to a possibility modal that triggers the dispositional semantics (Alexiadou & Doron 2012) for details. Note that the structure in (27) should not necessarily be interpreted as involving base generation of the theme argument in Spec, Voice. It could very well be that the theme argument moves to Spec, VoiceP from a position below Voice, i.e. from the vP domain. As a result, the structure is spelled-out with active Voice, and feeds *-er* nominal formation, see Fujita (1994), and Schäfer (2008) for discussion.

4. Deponent verbs

In the final section of this paper, I turn to deponent verbs, both intransitive and transitive ones as in (28) in Greek:

- (28) O Janis ekmetalevete ton Pavlo
 the John-nom exploit-NAct3sg the Paul-acc
 John exploits Paul

Deponents constitute a mismatch between form and function, see Baerman (2007), in the following sense. Predicates such as the one in (28) have a transitive syntax, but surface with non-active morphology on the verb. In contrast, predicates such as *erhome* 'come-Non-active' are intransitive, bear non-active morphology, but do not seem to have a transitive counterpart. Previous accounts of this mismatch all assume that there is something special about these predicates, and thus the information that they obligatorily surface with non-active morphology must somehow be listed (see e.g. Embick 2000, Kiparsky 2009, and others following them).

From the perspective of the discussion in sections 2 and 3, we must assume that deponents surface in structure (16b), i.e. they contain a non-active Voice head. The question that arises is why some of them have a transitive syntax and why others bear non-active morphology in the absence of a transitive entry. The latter issue can be straightforwardly accounted for under the system of Voice adopted in (16b), but something more needs to be said about transitive deponents.

To answer these questions, let us now consider some more facts about Greek deponent verbs, which will substantiate the observation that these belong to well-defined semantic classes, see also Oikonomou (2011) for Greek; see Xu, Aronoff & Anshen (2007) for Latin, Kallulli (2013) for Albanian. Zombolou & Alexiadou (2013) compiled a corpus of Greek deponents in order to be able to determine which classes these verbs belong to. This corpus includes the following verb classes: (a) verbs on which dictionaries and native speakers agree that they are deponent, i.e. they lack active counterparts (68%, e.g. *aminome* 'defend oneself'), (b) verbs that are reported as deponents in one dictionary while they are reported as non-deponents in others (19%, e.g. *idikevo* 'specialise sb./idikevome 'specialise'), (c) verbs that although they are reported to lack active counterparts by all dictionaries, native speakers use their active counterparts (2%, e.g. *kselemiazo-Act* 'stretch one's neck'/*kselemiazome* 'get a stretched neck'), (d) verbs that although they are reported to have active counterparts, their non-active form is reported to be more frequently used (6%, e.g. *vuvono* 'strike dumb'/*vuvonome* 'be struck dumb'), (e) verbs that have active counterparts on the basis of suffixation (3%, e.g. *fov[iz]o* 'frighten' vs. *fovame* 'fear'), and (f) verbs that have active forms, but these are associated with a different meaning than their non-active counterparts (2%, e.g. *viazozome* 'rape' vs. *viazome* 'be in hurry'). The corpus includes also those verbs that surface in non-active in the imperfective aspect, while they surface in the active in the perfective (e.g. *ginome/egina* 'become' or *erhome/irtha* 'come'). According to Zombolou & Alexiadou, the number of deponents in MG is 1,348 verbs out of

approx. 5,500 verbs (20%).

An examination of the morphological composition of deponent verbs carried out by the authors revealed that most of the verbs are denominal/deadjectival verbs, some are preceded by the prefixed *afto-* ‘oneself’ and *alilo-* ‘each other’ verbs, and fewer are compounds (13%), while very few verbs are root verbs (just 2%, e.g. *erhome* ‘come’ and *ime* ‘be’). In terms of interpretation, the denominal verbs denote that the verbal subject is affected by the base noun (e.g. *seliniazome* ‘be affected by the moon’, < *selini_N* ‘moon’). The deadjectival ones denote either that the verbal subject is affected by the property denoted by the base adjective (e.g. *ironevome* ‘be ironic’, < *iron_A* ‘ironic’) or that the verbal subject ends in the result state denoted by the base adjective (e.g. *enilikionome* ‘reach the age of an adult, become an adult’, < *enilikos_A* ‘adult’). These types of readings fall well within the domain of middle Voice, see the discussion in Kemmer (1993).

We saw above that reflexive/reciprocal meaning can be expressed via the NAct-form. However, verbs prefixed by the *afto-* ‘oneself’ and *alilo-* ‘each other’ verbs are (mostly) non-deponent verbs (e.g. *eksipireto*-Act ‘serve’) which can have the passive meaning only by the NAct (e.g. *eksipiretume*-NAct ‘be served’). In order for these verbs to receive the reflexive/reciprocal meaning the prefixation by the *afto-* ‘oneself’ and *alilo-* ‘each other’ prefix respectively is obligatory (e.g. *aftoeksipiretume*-NAct ‘serve oneself’ and *aliloeksipiretumaste*-NAct ‘serve each other’; see Alexiadou to appear, Zombolou 2004 for discussion and references). Morphologically, *afto-* ‘oneself’ and *alilo-* ‘each other’ verbs must be considered as deponents since they lack Act-counterparts (**aftoeksipireto*-Act and **aliloeksipireto*-Act). This class of predicates has been explicitly argued to make use of middle Voice in Greek in Alexiadou (to appear), and Spathas, Alexiadou & Schäfer (2013), and will not be further discussed here.

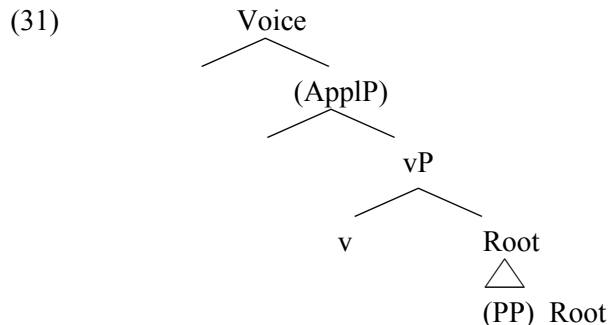
According to Zombolou & Alexiadou (2013), the second largest semantic category consists of anticausatives denoting a spontaneous or physical event (e.g. *ekrignime* ‘explode’, *revome* ‘belch’, *enilikionome* ‘become/reach the age of an adult’, *thalassopnigome* ‘drown at sea’). The third semantic category includes cognitive/psych verbs (e.g. *skeftome* ‘think’, *mihanevome* ‘invent’, *fovame* ‘fear’, *esthanome* ‘feel’, *gevome* ‘taste’). What have been called active-like deponents are 11% of the verbs in the corpus (e.g. *ekmetalevome* ‘exploit, benefit’, *eborevome* ‘trade’, *metahirizome* ‘handle, use’). Some of the deponents are unaccusatives, e.g. *erhome* ‘come’, *afiknume* ‘arrive’, *aperhome* ‘leave a place’, while 8% of the deponents are passivized verbs; under this category Zombolou & Alexiadou classified compound verbs such as *iliokeome* ‘be burnt by the sun’ and *androkratume* ‘be dominated by men’, but also non-compound verbs such as the denominal verbs *itome* (<*ita* ‘defeat’) ‘be beaten/defeated’ and *idrevome* (<*idor* ‘water’) ‘be supplied with water, be watered’.

Zombolou & Alexiadou (2013) make three important observations.

First, deponent verbs form the 20% of the Greek verbal vocabulary; hence they are too numerous to be considered as relicts or idiosyncratic verbs. Second, they are very productive. As the diachronic study of the corpus carried out by Zombolou & Alexiadou shows, 13% of the corpus appeared in MG for the first time (< 1700 AC-today). Most importantly, however, novel deponents keep surfacing. Third, most of the deponents are reflexives/reciprocals, anticausatives, cognitive, and psych verbs. If these are reflexives, and anticausatives, then they can be analyzed as including a structure of type (16b), as discussed in the previous section. Importantly, however, even the verbs that have a transitive syntax can be analysed as benefactives or malefactives. These are verbs which denote that the verbal subject acts in her/his own interest so that she/he will be affected by her/his own action as well, e.g. *ekmetalevome* ‘exploit, benefit’, *eborevome* ‘trade’, *metahirizome* ‘handle, use’.

Building on these results, and see also the discussion in Oikonomou (2011), let me now discuss the syntax of this last class of deponents. It is generally agreed upon that experiencer arguments are arguments of the root, Pesetsky (1995). Moreover, benefactives are introduced by ApplP, below Voice (Pylkkänen 2008). This means that deponent verbs involve non-canonical external arguments in the following sense. Kratzer (1996) argued that if a language learner encounters a transitive verb that has an external argument that does not correspond to an active voice head in the basic repertoire (agent), then he/she has to assume a non-active syntax. From this perspective, experiencers/benefactors start as PPs, lower in the structure, importantly below Voice, and P incorporates into v-Voice, thus assigning accusative Case to the theme object (31). Via P-incorporation morphology, which extends the domain of the Appl head, see den Dikken (2007), Voice can become active, since the DP can now move to the specifier of Voice. Roussou & Tsimpli (2007) report several new formations of deponents with active morphology, an observation also made in Zombolou & Alexiadou (2013). These new active verbs can then feed passivization, which is otherwise impossible with transitive non-active deponents:

- (29) ja na *dhiaxirisun* tin idhia tus tin omadha (vs. *diaxiristun*)
 for sub. manage the own theirs the-acc team manage-NAct-3pl
 “...in order to manage their own team.”
- (30) a. ..oste na to *ekmetalefsume* gia ti diasinoriaki...
 so.that sub. it exploit-1pl for the inter-borders
 “... so that we can exploit it for the inter-borders ...”
 b. i iroes tetjon istorion *ekmetalevonde* apo ta MME
 the heroes such stories exploit.nact-3p by the media
 “the heroes of such stories are being exploited by the media.”



In this structure, the experiencer/benefactor gets Nominative via Agree with T, as it is the closest argument with which T can agree with.

But why do deponents bear non-active morphology? According to Oikonomou (2011), since Voice does not introduce the external argument, it can be realized as non-active (Embick 2004). However, sometimes it is realized as active, suggesting that P-incorporation is followed by movement of the DP to Spec,Voice. Since the DP can but must not move to VoiceP, the predicate can both appear with active and non-active morphology.

A final question that arises is what regulates the distribution of deponent verbs across languages. Deponent verbs cannot exist in languages such as English, where argument alternations are very regular. In this type of language, the passive will receive a passive only interpretation as the result of the availability of the structure (16a). In contrast, dispositional middles (as well as reflexives, see Alexiadou & Schäfer (2013)), will make use of structure (27), thus they will only appear in an active syntax. From the logic of the system developed here, deponent predicates are predicted to exist only in languages that have Voice syncretisms of the type identified for Greek, i.e. they only make use of the non-active counterpart of active Voice in (15), illustrated in (16b). Only in this type of language can a non-active Voice head occur with predicates that lack transitive counterparts to begin with; this is the case in Albanian and Latin, see Kallulli (2013) and Xu, Aronoff & Anshen (2007) respectively, languages that have Voice systems very similar to that of Greek.

5. Conclusion

In this paper, I showed how differences in the nature of Voice systems across languages are responsible for the behavior of passives, dispositional middles and also regulate the distribution of deponency. These relate to the height and the domain of the non-active head involved in argument structure alternations. In passive Voice languages such as English, passive takes as its input a transitive VoiceP/VP. In middle Voice languages such as Greek, middle is the non-active counterpart of active Voice, which explains why it is subject to a

number of restrictions and idiosyncrasy.

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