

Passive *By*-Phrases in Greek and English: Adjuncts or Arguments?

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Abstract: Alexiadou et al. (2015:35) argue that Greek *by*-phrases merge as adjuncts. This is assumed for English and other languages by Bruening (2013) and Legate (2014). Hasegawa (1988), Goodall (1997, 1999), Mahajan (1994) and Collins (2018), on the other hand, argue that the *by*-phrase merges syntactically as an argument. This paper shows that in Greek and English *by*-phrases behave like arguments in being able to bind non-exempt anaphors. As a consequence, we argue that external arguments (in both the passive and the active) are not generated in Spec VoiceP, but rather in Spec vP, as in Chomsky (1995).

Keywords: passive, *by*-phrase, adjuncts, arguments, reflexives, non-exempt reflexive, Greek, English

1. Introduction

Greek passives involve non-active (NACT) morphology on the finite verb, rather than an auxiliary plus a participle, like in English. Thus, we see in (1a) that the verb is inflected for active morphology, and in (1b) and (1c) for non-active, in the present and past respectively. This morphology occurs in a number of environments such as with reflexive and reciprocal verbs, (2a)-(2b), unaccusatives/anticausatives, (2c), and middles (2d), or deponent verbs, (2e).¹

- (1) a. O kathijitis chirokrot-i tus fitites tu.
the professor applaud.ACT.PRES-3S the students his.GEN
'The professor applauds his students.'
- b. I fitites tu chirokrot-ude apo ton kathijiti.
the students his.GEN applaud-NACT.PRES.3S by the professor
'His students are applauded by the professor.'
- c. I fitites tu chirokroti-thik-an apo ton kathijiti.
the students his.GEN applaud-NACT.PAST-3P by the professor
'His students were applauded by the professor.'
- (2) a. O kathijitis ksiriz-ete.
the professor shave-NACT.PRES.3S
'The professor is being shaved.'
- b. Ta pedia agaliaz-onde.
the children hug-NACT.PRES.3P
'The children are hugging each other.'

¹Anticausatives may also appear with active morphology. Hence, compare (i) with (2c):

- (i) To trapezomandilo leros-e (apo ti saltsa).
the tablecloth get dirty.ACT.PAST-3S (from the sauce)
'The tablecloth got dirty because of the sauce.'

- c. To trapezomandilo lero-thik-e (apo ti saltsa).
 the tablecloth get dirty-NACT.PAST-3S (from the sauce)
 ‘The tablecloth got dirty because of the sauce.’
- d. To kenurjo vivlio tu X diavaz-ete grigora.
 the new book the X.GEN read-NACT.PRES.3S fast
 ‘X’s new book reads fast.’
- e. I nosokoma peripi-ite kala ton astheni.
 the nurse take care-NACT.PRES.3S well the patient
 ‘The nurse takes good care of the patient.’

Independently of the pervasive character of the non-active morphology, the Greek passive has been argued to differ from the passive of other languages such as English in two respects. First, some Greek verbs fail to passivize, which is unlike English where most verbs can undergo passivization (cf. Lascaratou and Philippaki-Warburton 1984, Zombolou 2004, Alexiadou et al 2015 i.a.). Second, Greek *by*-phrases cannot retain the agentive interpretation that the corresponding agents of the active sentences have. This is again different from English where *by*-phrases have been shown to vary in interpretation (see Jaeggli 1986), according to the external argument in the active.

Starting with the first difference, the verb *skotono* ‘kill’, (3a), for instance, cannot form the passive, as shown in (3b). It can still combine with NACT morphology, however, the meaning of the resulting form is idiomatic and the *by*-phrase or some other PP that can accompany it is more of a cause, see (3c).

- (3) a. O kleftis skotos-e tin ilikiomeni kiria.
 the thief kill.ACT.PAST-3S the elderly lady
 ‘The thief killed the elderly lady.’
- b. *I ilikiomeni kiria skotho-thik-e apo ton klefti.
 the elderly lady kill-NACT.PAST-3S by the thief
 ‘The elderly lady was killed by the thief who broke into her house.’
- c. Skoto-thik-a apo ti zesti simera/ s-ti dulia simera.
 kill-NACT.PAST-1S by the heat today/ at-the work today.
 ‘I was exhausted by the heat/ by work today.’

Turning our attention to *by*-phrases, it has been observed that some verbs, those denoting indirect causation, tend to accept *by*-phrases with collective, plural or non-specific nouns, while *by*-phrases with concrete nouns are degraded, as shown in (4) and (5) (cf. Philippaki-Warburton 1975: 563, Zombolou 2004).² Alexiadou et al. (2015: 121-122, 135) take these facts to mean that “...the distribution of the *by*-phrase is severely restricted in the sense that it is characterized by what has been called ‘reduced agentivity’...”, and they “...hypothesize that such PPs are actually

² Yet, one can find well-formed instances with passive *skotono* followed by an agentive *by*-phrase, such as the example below from google, which we and other native speakers find entirely grammatical:

- (i) O polimixanos Odiseas skoto-thik-e apo ton idio tu ton jo.
 the cunning Ulysses killed-NACT.PAST-3S by the own his the son
 ‘The cunning Ulysses was killed by his own son.’

interpreted as causers since they are rather abstract, and as a result can happily co-occur with anticausative predicates.”

- (4) a. *O Kostas skoto-thik-e apo ton Giani.
the Kostas kill-NACT.PAST-3S by the John
‘Kostas was killed by John.’
b. O Kostas skoto-thik-e apo tus ehthr-us.
the Kostas kill-NACT.PAST-3S by the enemy-PL
‘Kostas was killed by the enemy.’
- (5) a. * I spiti kaik-e apo ton Kosta.
the house burn.NACT.PAST-3S by the Kosta
‘The house was burnt by Kosta.’
b. To spiti kaik-e apo tus ebristes.
the house burn.NACT.PAST-3S by the arsonists
‘The house was burnt by the arsonists.’

This paper presents new data from a nearly exhaustive investigation of Greek verbs showing that a large subset of Greek verbs is able to undergo passivization and to accept agentive *by*-phrases (Section 2). This suggests that passivization is a productive grammatical process in Greek, and that agentive *by*-phrases are not restricted. In Section 2, we also show that *by*-phrases need not only be agents; they can bear different theta-roles, exactly like the corresponding *by*-phrases of English (cf. Jaeggli 1986:599, Collins 2005: 82-83). Focusing on agents, we argue following a strict version of UTAH (cf. Baker 1988, 1997) that agentive *by*-phrases merge as arguments in the syntactic position where agents are normally introduced in the active (cf. Collins 2005, 2018 amongst others). Section 3 argues that if Voice is the head that is responsible for the non-active morphology, like it is standardly assumed at least for Greek, the external argument should be introduced in a projection which is not Spec VoiceP (*contra* Kratzer 1996). Section 4 discusses binding facts showing that *by*-phrases can bind non-exempt anaphors, whereas DPs within adjuncts PPs cannot. This section argues that *by*-phrases can bind anaphors because they merge as arguments (cf. Collins 2005, 2018) in the local domain in which anaphors need to be bound. Section 5 is the conclusion.

2. The picture from Greek

The starting point for this study was the intuition that there are indeed verbs in Greek which: a) form fine passives, and b) the passives they form can very well accept a *by*-phrase which, moreover, is agentive. The latter point should not be taken at all for granted given the discussion in Alexiadou et al. (2015), which clearly holds that *by*-phrases are systematically different from the external arguments in the active. In order to find out if our intuition about *by*-phrases was on the right track, we undertook a nearly exhaustive search of all Greek verbs that appear in Mpampiniotis (1998), one of the most comprehensive dictionaries of Modern Greek. Going through each verb in the dictionary and using our intuition to decide whether they may form a passive with an agentive *by*-phrase, we created a list of such verbs that we subsequently checked in corpora,³ in google searches and with other native speakers in order to confirm that they were indeed well-formed. Below appear five random examples from our google search:

³ The corpora are available at: <http://www.sek.edu.gr/> (cf. Goutsos 2010).

- (6) I grafi afti apokriptografi-thik-e apo ton Jean-François Champollion.
the script this decipher-NACT.PAST-3S by the Jean-François Champollion
'This script was deciphered by Jean-François Champollion.'
- (7) Pia itan i neari Kypria pu vravef-tik-e apo tin vasilisa Elisavet?
who was the young Cypriot who award-NACT.PAST-3S by the queen Elizabeth
'Who was the young Cypriot woman who was awarded by Queen Elizabeth?'
- (8) I megali ethusa diakosmi-thik-e apo ton Italo arhitektona L. Cappellaro.
the big auditorium decorate-NACT.PAST-3S by the Italian architect L. Cappellaro
'The big auditorium was decorated by the Italian architect Lucio Cappellaro.'
- (9) To moro egatalif-thik-e apo ti mitera tu s-to proavlio tu nosokomiu.
the baby abandon-NACT.PAST-3S by the mother its.GEN at-the yard the hospital.GEN
'The baby was abandoned by its mother at the yard of the hospital.'
- (10) Ihografi-thik-e apo ton Marko ke to tragudis-e o Stratos Pagiumtzis.
record-NACT.PAST-3S by the Markos and it sang.ACT.PAST-3S the Stratos Pagiumtzis
'(It) was recorded by Markos (Vamvakaris), and Stratos Pagiumtzis sang it.'

We noted 210 such instances of different passive verbs in sentences with agentive *by*-phrases, and the list is not exhaustive. In addition to verbs that most likely we have missed, we did not include cases in which the *by*-phrase contained definite uses of mass nouns, as in (11), or organizations/institutions, as in (12), although these DPs function as agents either in the *by*-phrases or in the corresponding active sentence. We did that because we wanted to make sure that the *by*-phrase includes a definite DP with rigid reference to an individual, which is interpreted as an agent exactly like the external argument of the corresponding active sentence.

- (11) O martirikos tu thanatos, pu enepnefs-e to dimotiko tragudi,
the cruel his.GEN death that inspire.ACT.PAST-3S the folk song,
ipirks-e megali simfora ke thrini-thik-e apo ton lao.
was.ACT.PAST-3S enormous disaster and wailed-NACT.PAST-3S by the people
'His martyrdom, which inspired folk songs, was an enormous disaster and was wailed by the people.'
- (12) To nomosxedio den egri-thik-e apo ton OIE.
the bill not approve-NACT.PAST-3S by the UN
'The bill was not approved by the UN.'

The fact that a large subset of Greek nonactive verbs can take agentive *by*-phrases disproves the claim that these PPs realize causers and not agents like the external arguments of the corresponding active sentences.

Interestingly, Greek *by*-phrases do not have to be agents. Sentences (13-18) illustrate a number of cases in which the theta-role of the *by*-phrase varies with the verb. Thus, the *by*-phrases in (16-17) are recipients and experiencers respectively (cf. Alexiadou and Anagnostopoulou 2009, Alexiadou et al. 2015). Moreover, (18) shows that even idiomatic subjects can appear in *by*-

phrases.⁴ So, the Greek *by*-phrases are no different from the English *by*-phrases which have been shown to bear different theta-roles (cf. Jaeggli 1986:599, Collins 2005: 82-83).

- (13) I vasiki idea itan oti to fos ekpeb-ete apo
the basic idea was that the light emit-NACT.PRES.3S by
ta ilektrika fortismena somatidhia.
the electrically charged particles
'The basic idea was that the light is emitted by the electrically charged particles.'
- (14) I Maria aghapi-thik-e poli apo ton adra tis.
the Maria love-NACT.PAST-3S a lot by the husband her.GEN
'Maria was loved a lot by her husband.'
- (15) I tenia pu misi-thik-e apo tin Agatha Christie.
the movie that hate-NACT.PAST-3S by the Agatha Christie
'The movie that was hated by Agatha Christie.'
- (16) To grama paralif-thik-e apo ton Emona.
the letter receive-NACT.PAST-3S by the Emona
'The letter was received by Emonas.'
- (17) O pechtis pu latrev-ete apo tus filathus.
the player that adore-NACT.PRES.3S by the fans
'The player that is adored by the fans.'
- (18) Tha enimerο-thik-e apo kapjo pulaci.
must inform-NACT.PAST-3S by some little bird
'He must have been filled in/informed by some little bird.'

Given that the theta-role of the *by*-phrase can vary with the verb, it makes sense to assume that the *by*-phrase is assigned this theta-role. Let us restrict our attention to agents. Under UTAH (Uniformity of Theta-Assignment Hypothesis; Baker 1988:46, 1997:74), the *by*-phrase can be an agent, if it is merged as an argument, entering the derivation in the syntactic position where agents are normally introduced in the active. If this syntactic position is Spec vP (cf. Chomsky 1995), *by*-phrases can be agents because Spec vP is uniformly projected in the active and the passive (see Collins 2005:92-93 for more detailed discussion on theta-role assignment of the *by*-phrase under UTAH). The next section discusses how the morphology of the Greek passive can be accounted for if the external argument is syntactically projected in a uniform way in the active and the passive. The sections that follow discuss binding facts that speak in favor of the assumption that the *by*-phrase is indeed an argument.

3. Synthetic Morphology and VoiceP

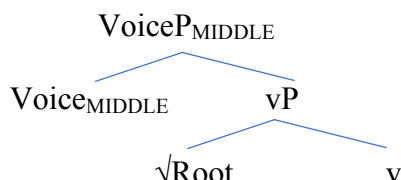
A prevalent view in syntactic theory after Kratzer (1996) is that the external argument of the active is introduced by Voice, in Spec VoiceP. Alexiadou et al. (2015) adopt this assumption, and further argue that Spec VoiceP is not projected in the Greek passive. Given this, they propose that non-

⁴ (18) is accepted with the characteristic intonation of ironic speech.

active voice morphology in Greek marks the absence of Spec VoiceP. This is formally captured by the Spell Out rule in (19) (see also Embick 1998 for similar assumptions). The Voice head this rule refers to is Voice_{MIDDLE}, as indicated in the tree derivation in (20). Voice_{MIDDLE} is assumed to introduce an external argument variable and to existentially bind it at the same time.

(19) Voice → Voice[NonAct]/ ____ No DP specifier (Alexiadou et al. 2015:102)

(20) Greek Passive



If agents are uniformly projected in the syntax in the active and the passive, like we discussed in the previous section, the rule in (19) does not correctly describe the distribution of non-active voice morphology in Greek. One way out is to dissociate voice morphology and the external argument projection.⁵ Thus, if voice morphology is found in Voice (projecting a VoiceP), as in Rivero 1990, then the external arguments should not be generated in Spec VoiceP, but in some other projection, e.g. in Spec vP, as in Chomsky (1995). Under this view, Voice plays a role in the syntax of the passive but has nothing to do with the projection of the external argument (cf. Collins 2005).

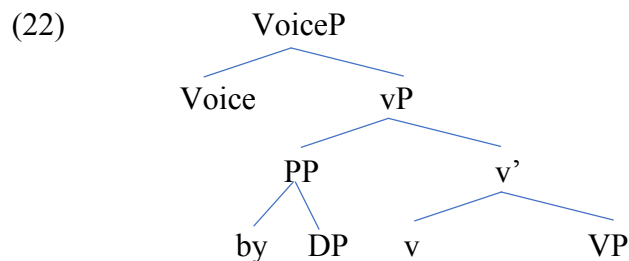
Thus, based on the Greek data, we come to the following conclusion:

(21) The external argument is not introduced in Spec VoiceP.

Merchant (2013:98) is led to similar conclusions, based on VP-ellipsis facts: “The crucial element involved in these accounts is the separation of the head that determines voice from the head that determines the external valency of the predicate. There is in fact no conceptual reason these two should go together, and the ellipsis facts argue directly against this assumption.”

Even though we have rejected (19), we have not replaced it with some other theory of non-active voice in Greek. Our claim in (21) needs to be supplemented with some adequate theory of the distribution of non-active voice in the future.

Given (21), the structure for the Greek passive consistent with these conclusions is illustrated in (22). In what follows, we show that the structure in (22) finds support in binding facts.



⁵ See also Manzini et al. (2016:111) for an account of the morpho-syntax of the Greek passive where ‘no hidden features/abstract heads encoding interpretation are postulated, nor any Distributed Morphology-style realizational component.’

4. The Greek Anaphor

The Greek anaphor *o eaftos mu* literally translates to ‘the self mine’. The *eaftos* ‘self’ noun is invariably masculine, while the preceding determiner agrees with the noun in the relevant features. The possessive pronoun agrees in φ -features with its antecedent. *O eaftos mu* has been discussed in the past in a number of articles focusing on different aspects of its behavior, such as the fact that it can be clitic doubled (cf. Iatridou 1988) without giving rise to Condition B violations or that it can be used with nominative case in some derived subject positions (cf. Anagnostopoulou and Everaert 1999 i.a.). In these analyses it is acknowledged that, despite the peculiar syntactic behavior in some cases, *o eaftos mu* is no different from the English reflexive in requiring a local c-commanding antecedent, as shown below.

- (23) a. O Jorghos₁ estil-e ta vivlia s-ton eafto tu₁.
the George send.ACT.PAST-3S the books to-the self his.GEN
‘George sent the books to himself.’
b. * I mitera tu Yorghu₁ estil-e ta vivlia
the mother the George.GEN send.ACT.PAST-3S the books
s-ton eafto tu₁.
to-the self his.GEN
‘George’s mother sent the books to himself.’
- (24) a. O Jorghos₁ aghoras-e ena dhoro ja ton eafto tu₁.
the George buy.ACT.PAST-3S a gift for the self his.GEN
‘George bought a gift for himself.’
b. * I mitera tu Jorghu₁ aghoras-e ena dhoro
the mother the George.GEN buy.ACT.PAST-3S a gift
ja ton eafto tu₁.
for the self his.GEN
‘George’s mother bought a gift for himself.’

One property of *o eaftos mu* which has received less attention and makes it different from the English reflexive is that it has limited usages which do not fall under standard Condition A (see discussion in Angelopoulos and Sportiche (in progress)). Anaphors have been argued to behave as exempt from Condition A when they function as logophors (cf. Charnavel and Sportiche 2016 i.a.). A characteristic property of logophors is that they need to be anteceded by perspective centers, such as attitude holders, empathy loci or deictic centers (cf. Charnavel and Zlogar 2015 and references therein). It is remarkable that *o eaftos mu* is prohibited in contexts in which the English reflexive has been argued to function as a logophor that is anteceded by perspective centers.

Consider the following strongly ungrammatical sentences in Greek and compare them with the English sentences in the translation. The latter have been reported as well-formed in previous literature. The two sentences in (25) feature anaphors with attitude holders as antecedents (cf. Charnavel and Zlogar 2015, 2a,c citing Pollard and Sag 1992 and Reinhart and Reuland 1993, 670, i.a.). In (26) the anaphors have antecedents that have been identified as empathy loci (Kuno 1987, Charnavel and Zlogar 2015, 18a,c).

- (25) a. *O Vasilis₁ ip-e oti i vrochi katestreps-e
the Bill say.ACT.PAST-3S that the rain destroy.ACT.PAST-3S
tis fotografies tu eaftu tu₁.
the photos the self his.GEN
‘Bill said that the rain destroyed the photos of himself.’
b. *O Janis₁ kafchi-thik-e oti i vasilisa kales-e
the John boast-NACT.PAST-3S that the queen invite.ACT.PAST-3S
tin Anna ke ton eafto tu₁ ja potō.
the Anna and the self his.GEN for drink
‘John boasted that the queen invited Anna and himself for a drink.’
- (26) ?* O Pavlos₁ dulev-e se ena panepistimio
the Paul worked.ACT.PAST-3S at a university
me ti jineka tu opu fisiki san ton eafto tu₁
with the wife his.GEN where physicists like the self his.GEN
echer-an ipsilis ektimisis.
enjoy.ACT.PAST-3P high regard
‘Paul worked at a university with his wife where physicists like himself were highly regarded.’

Given that *o eaftos mu* resists logophoric usages (cf. also Anagnostopoulou and Everaert 1999 for similar conclusions), it makes sense to assume that in the examples to be discussed in the following section we have clear cases of pure reflexives that are subject to standard Condition A. Moreover, we examine the relevant English sentences with inanimate antecedents in order to make sure that logophoricity is not relevant in English either. Using inanimacy as a tool to avoid logophoric usages is proposed in Charnavel and Sportiche (2016).

4.1 Reflexives bound by *by*-phrases in Greek

In this section we show that Greek reflexives can have a *by*-phrase antecedent (cf. 27a and 28a). On the other hand, DPs hosted in any sort of adjunct PPs systematically fail to function as antecedents for reflexives. We test adjunct phrases with *eksetias* ‘because of’, a P followed by a DP with genitive case (cf. 27b), *choris* ‘without’, a P followed by an accusative case marked DP (cf. 27d), adjunct locative PPs (28b) and *mazi* ‘together’, a P followed by a functional preposition *me* and an accusative case marked DP (cf. 28d). The sentences below are testing binding from within adjunct phrases e.g. (27c), (27e), (28c) and (28e), and show that ungrammaticality is only due to binding.⁶

- (27) a. Aftes i diataksis psifis-tik-an apo tus vuleftes₁
these the regulations vote-NACT.PAST-3P by the MPs
tis kivernisis ja ton eafto tus₁.
the government.GEN for the self their.GEN
‘These regulations were voted by the MPs of the government for themselves.’

⁶ The contrasts reported in this section reflect the judgments of the two authors native speakers of Greek and the judgments of five participants at a Syntax Reading Group held at the University of Patras in September 2018.

- b. * Aftes i diataksis psifis-tik-an eksetias ton vulefton₁
 these the regulations vote-NACT.PAST-3P because the MPs
 tis kivernisis ja ton eafto tus₁.
 the government.GEN for the self their.GEN
 ‘These regulations were voted because of the MPs of the government for themselves.’
- c. Aftes i diataksis psifis-tik-an eksetias ton vulefton
 these the regulations vote-NACT.PAST-3P because the MPs
 tis kivernisis ja aftus ce tis ikojenies tus.
 the government.GEN for them and the family their.GEN
 ‘These regulations were voted because of the MPs of the government for them and their families.’
- d. * Aftes i diataksis psifis-tik-an choris tus vuleftes₁
 these the regulations vote-NACT.PAST-3P without the MPs
 tis kivernisis ja ton eafto tus₁.
 the government.GEN for the self their.GEN
 ‘These regulations were voted without the MPs of the government for themselves.’
- e. Aftes i diataksis psifis-tik-an choris tus vuleftes
 these the regulations vote-NACT.PAST-3P without the MPs
 tis kivernisis ja aftus ce tis ikojenies tus.
 the government.GEN for them and the family their.GEN
 ‘These regulations were voted without the MPs of the government for them and their families.’
- (28) a. Aftes i bluzes epilech-tik-an apo ta phedja₁
 these the t-shirts select-NACT.PAST-3P by the kids
 ja ton eafto tus₁.
 for the self their.GEN
 ‘These t-shirts were selected by the kids for themselves.’
- b. * Aftes i bluzes epilecht-ik-an brosta/ koda s-ta phedja₁
 these the t-shirts select-NACT.PAST-3P in front/near of-the kids
 ja ton eafto tus₁.
 for the self their.GEN
 ‘These t-shirts were selected in front/near the kids for themselves.’
- c. Aftes i bluzes epilech-tik-an brosta s-ta phedja
 these the t-shirts select-NACT.PAST-3P in front to-the kids
 ja afta ce tis ikojenies tus.
 for them and the families their.GEN
 ‘These t-shirts were selected in front of the kids for them and their families.’
- d. * Aftes i bluzes epilech-tik-an mazi me ta phedja₁
 these the t-shirts select-NACT.PAST-3P together with the kids
 ja ton eafto tus₁.
 for the self their.GEN
 ‘These t-shirts were selected together with the kids for themselves.’

- e. Aftes i bluzes epilech-tik-an mazi me ta phedja
 these the t-shirts select-NACT.PAST-3P together with the kids
 ja afta ce tis ikojenies tus.
 for them and the families their.GEN
 ‘These t-shirts were selected together with the kids for them and their families.’

These sentences show that Greek *by*-phrases pattern with arguments, not with adjuncts, contrary to claims of Bruening (2013) and Legate (2014). If the Greek *by*-phrases are arguments, then they must occupy A-positions.

4.2 Reflexives bound by *by*-phrases in English

English reflexives are shown below with data first reported in Collins (2018,10-11) to be bound by *by*-phrases. On the other hand, DPs hosted within clear cases of adjuncts cannot bind reflexives, exactly like what we saw in Greek.

- (29) a. The packages were sent by the children₁ to themselves₁.
 b. * The packages were sent for the children₁ to themselves₁.
 c. * The packages were sent on behalf of the children₁ to themselves₁.
 d. * The packages were sent because of the children₁ to themselves₁.
- (30) a. The pictures were painted by the children₁ for themselves₁.
 b. * The pictures were painted with the children₁ for themselves₁.
 c. * The pictures were painted near the children₁ for themselves₁.
 d. * The pictures were painted in spite of the children₁ for themselves₁.

The DPs in the *by*-phrases above do not seem to encode any kind of perspective center. Definitely they are not attitude holders, as the subject of *send* or *paint* does not hold attitudes, and they cannot be empathy loci. Moreover, Kuno and Kaburaki (1977, 647-648) state in the Surface Structure Empathy Hierarchy they propose that it is “[...] impossible for the speaker to empathize with the referent of the *by*-passive agentive.” This is due to minimal pairs like the one in (31). Here, Kuno and Kaburaki (1977, 59a,b) argue that while most speakers have a preference interpreting the anaphor as being bound by the subject in (31a) (their 59a), (31b) (their 59b) is marginal, however, it “is much less ambiguous than that of (31a)/59a: most speakers do not obtain the interpretation in which *himself* is coreferential with *John*, the *by*-passive agent of the sentence.”

- (31) a. John told Bill₁ about himself₁.
 b. Bill was told by John₁ about himself₁.

As a last remark, note that *by*-phrases are not deictic centers either as they do not encode spatial (or perceptual) perspective. At any rate, the DP in the *by*-phrase of an English passive can be inanimate and still bind an anaphor, as shown below. Inanimates cannot act as antecedents for logophors because they cannot hold perspective (cf. Charnavel and Sportiche (2016)).

- (32) a. The magnet₁ attracted the metallic objects towards itself₁.
 b. The metallic objects were attracted by the magnet₁ towards itself₁.

- (33) a. The black hole₁ drew the planets into itself₁.
 b. The planets were drawn by the black hole₁ into itself₁.
- (34) a. The tornado₁ sucked the houses up into itself₁.
 b. The houses were sucked by the tornado₁ up into itself₁.
- (35) a. The magnet₁ repelled the pieces of metal away from itself₁.
 b. The pieces of metal were repelled by the magnet₁ away from itself₁.

In an informal survey, three native speakers of English find either both the (a) and (b) examples acceptable, or that the (b) examples are marginal (?). No speakers have found the (b) examples ungrammatical.⁷

4.3 Discussion

In the previous sections we presented data from two languages, Greek and English, in which *by*-phrases can bind pure non-exempt anaphors, unlike DPs hosted in adjuncts. Non-exempt anaphors like *o eaftos mu* or inanimate anaphors as in (32-35) need to be bound, given the following standard formulation of the Principle A of Binding Theory (Koopman et al. 2013, 168):

- (36) Principle A: An anaphor must be bound in its domain.

In (27d) repeated below as (37b) the reflexive cannot be bound by *ton vulefton* because it is dominated by the PP *eksetias ton vulefton*. In (37a) the reflexive can be bound by the *by*-phrase:

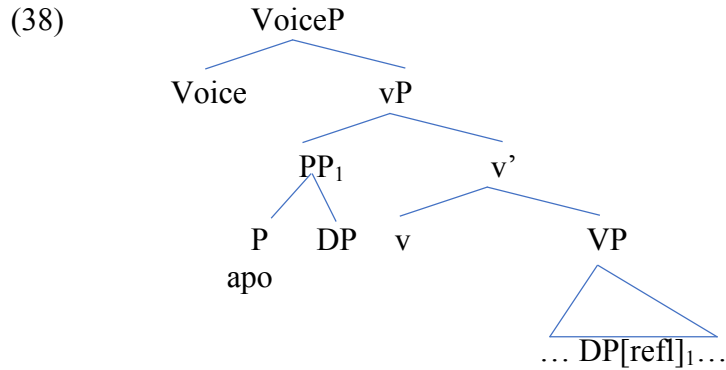
- (37) a. Afta ta nomoschedia psifis-tik-an apo tus vuleftes₁
 these the bills vote-NACT.PAST-3P by the MPs
 tis kivernisis ja ton eafto tus₁.
 the government.GEN for the self their.GEN
 ‘These bills were voted by the MPs of the government for themselves.’

⁷ In an informal survey with a few native speakers we found that similar examples are marginally acceptable in Greek (see i-ii below). Most speakers report, however, that these examples sound more or less equally degraded in the active and passive because of the independent marginal status of *o eaftos mu* when it has an inanimate and less agentive antecedent. For instance, *ilios* ‘the sun’ below is not an agent as its actions do not require volition. Another potential problem could be that *o eaftos mu* is not always easy to find in locative PPs (cf. Anagnostopoulou and Everaert 1999:110).

- (i) O ilios₁ ethes-e se trochia jiro apo ton eafto tu₁ dhio
 the sun put.ACT.PAST-3S in orbit around from the self his.GEN two planets
 ‘The sun put two planets into an orbit around itself.’
- (ii) Dhio planites te-thik-an apo ton ilio₁ se trochia jiro apo ton eaftotu₁
 two planets put-NACT.PAST-3P by the sun in orbit around from the self his.GEN
 ‘Two planets were put by the sun into orbit around itself.’

- b. * Afta ta nomoschedia psifis-tik-an choris tus vuleftes₁
 these the bills vote-NACT.PAST-3P without the MPs
 tis kivernisis ja ton eafto tus₁.
 the government.GEN for the self their.GEN
 ‘These bills were voted without the MPs of the government for themselves.’

Following the analysis of *by*-phrases in Collins (2018), Goodall (1997, 1999), Hasegawa (1988) and Mahajan (1994), we assume that the *by*-phrase in Greek is a PP argument that occupies the same position as the external argument DP in the active. Our analysis is presented in (38):



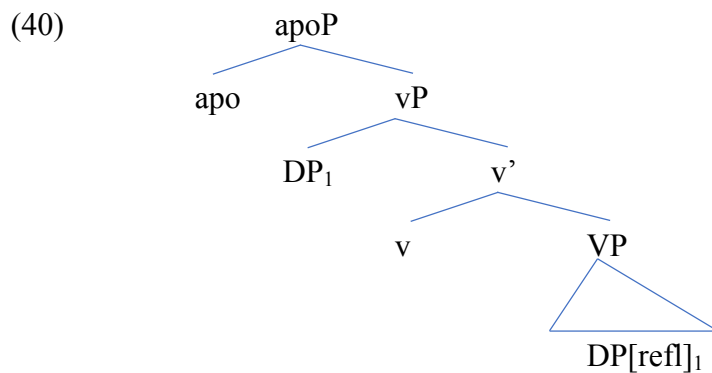
In this structure the PP headed by *apo* ‘by’ binds the reflexive that is contained within the VP. In this way, the *by*-phrase is acting like an argument: it is externally merged into an argument position, and it binds a reflexive pronoun. Following Collins (2018), we assume that the ϕ -features of the reflexive pronoun are determined by the DP which is the complement of *apo* ‘by’.

Consider now example (37b) involving an adjunct PP:

- (39)[without DP₁]....DP[refl]₁

The DP complement of *without* does not c-command the reflexive, and therefore it cannot bind the reflexive. The PP itself is not an argument, and therefore cannot bind the reflexive either.

Another possible analysis of the passive, consistent with both the Greek and English data, is that in Collins (2005), where *by* merges separately from its surface complement:⁸



⁸ The structure in (40) is simplified. We leave open for future research the exact height at which *apo* merges.

In this analysis, the external argument in the passive is a DP in Spec vP just like the external argument in the active is a DP in Spec vP. The difference between (39) and (40) is that in (39), the preposition ‘by’ and the following DP form a constituent, but not in (40). Therefore, the prediction of the analysis in (39) is that [by DP] should pass various constituent structure tests. The choice between these two alternatives is complicated, and not relevant to the results in our paper, so we refer readers to Collins (2005) and Legate (2014) for a discussion of the issues.

Before closing this section, we would like to address two residual issues. First, passivized verbs precede *by*-phrases in Greek. In (38) and (40), it is not obvious how this surface order can be derived if the verb stays in “little v”. In order to resolve this issue, we make our assumptions about the movement steps that the verb undergoes in the Greek passive clearer. Concretely, following Rivero (1990:136-138), we assume that the verb in the Greek passive always moves to Voice. Given this, the verb precedes *by*-phrases in the Greek passive, because Voice in our analysis merges higher than the vP. Alternatively, the surface order is derived due to movement of the VP to a specifier higher than Spec vP, smuggling the internal argument à la Collins (2005).

Second, we assumed that *o eaftos mu* is subject to standard Condition A, as in Angelopoulos and Sportiche (in progress). Based on this, we argued that data such as (37a) suggest that the *by*-phrase is an argument. This conclusion does not necessarily hinge on this particular theory of anaphora. In predicate-based theories of anaphora, an anaphor and its antecedent have to be (co)arguments, unless the anaphor is used as a logophor (cf. Reinhart and Reuland 1993). Building on Reinhart and Reuland (1993), Anagnostopoulou and Everaert (1990) argue that *o eaftos mu* lacks logophoric usages, which suggests that if the antecedent of *o eaftos mu* can be the *by*-phrase, hence, the *by*-phrase has to be an (co)argument, not an adjunct.

5. Conclusion

In this paper, we have established that the *by*-phrase in Greek can bear a variety of theta-roles (see Jaeggli 1986 on English), just like the external argument in the active. This finding suggests that the *by*-phrase in Greek is projected in the same way as the external argument in the active. And in fact, the *by*-phrase in Greek can also bind a reflexive, which is a property of arguments. We have shown how to capture this binding fact by externally merging the *by*-phrase in both languages into Spec vP, which is the position of external arguments. From Spec vP, the *by*-phrase c-commands and binds non-exempt reflexive pronouns contained in the VP and so is in a local domain in which binding of reflexives is possible, unlike with adjuncts.

Our results have a number of general consequences. First, the binding theory data that we have discussed supports the analysis of the *by*-phrase given in Collins (2018), Goodall (1997, 1999), Hasegawa (1988) and Mahajan (1994), where the *by*-phrase is an argument that is externally merged in the same position as the underlying position of the external argument in the active. Our analysis clearly argues against recent analyses of Bruening (2013), Legate (2014) and Alexiadou et al. (2015) who claim that the *by*-phrase is an adjunct.

The data in this paper also argues against the hypothesis that external arguments are externally merged in Spec VoiceP. The presence or absence of non-active voice morphology in Greek is independent of the existence of an external argument. For example, some intransitive inchoatives (with no external argument) bear non-active voice morphology, exactly like the passive which also bears non-active voice morphology. We propose instead the label of vP (following Chomsky 1995) as the projection which introduces external arguments.

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