

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

Nikos Angelopoulos, Chris Collins, Arhonto Terzi
UCLA, NYU, TEI of W. Greece

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). On the other hand, Hasegawa (1988), Goodall (1997, 1999), Mahajan (1994) and Collins (2018), 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).

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1. Introduction

Greek passives involve non-active (NACT) morphology on the finite verb, rather than the auxiliary plus a participle of English. Thus, we see in (1a) that the active verb is inflected only for person morphology, and in (1b) and (1c) that the passive verb combines with a portmanteau suffix encoding non-active and present or past tense respectively. This morphology occurs with different kinds of verbs such as with reflexive and reciprocal, (2a)-(2b), unaccusative/anticausative, (2c), middle, (2d), or deponent verbs, (2e).¹

(1) a. O kathijitis chirokrot-i tus fitites.

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 from the sauce.'

- the professor applaud.ACT.PRES-3S the students
 ‘The professor applauds the students.’
- b. I fitites chirokrot-unde apo ton kathijiti.
 the students applaud-NACT.PRES.3S by the professor
 ‘The students are applauded by the professor.’
- c. I fitites chirokrot-ithikan apo ton kathijiti.
 the students applaud-NACT.PAST.3P by the professor
 ‘The students were applauded by the professor.’
- (2) a. O kathijitis ksiriz-ete.
 the professor shave-NACT.PRES.3S
 ‘The professor is shaving.’
- b. Ta pedhia agaliaz-onde.
 the children hug-NACT.PRES.3P
 ‘The children are hugging each other.’
- c. To trapezomandilo lero-thike (apo ti saltsa).
 the tablecloth get dirty-NACT.PAST.3S (from the sauce)
 ‘The tablecloth got dirty from of the sauce.’
- d. To kenurjo vivlio tu Markari diavaz-ete ghrighora.
 the new book the Markari.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 (cf. Lascaratou and Philippaki-Warburton 1984, Zombolou 2004, Alexiadou et al 2015 i.a.). First, some Greek verbs fail to passivize, unlike English where most verbs can undergo passivization. Second, Greek *by*-phrases do not 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 according to the external argument in the active (see Jaeggli 1986).

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,

but the meaning of the resulting form is idiomatic and the *by*-phrase or some other PP that may accompany it is more of a cause, see (3c).²

- (3) a. O kleftis skotose tin ilikiomeni kiria.
 the thief kill.ACT.PAST.3S the elderly lady
 ‘The thief killed the elderly lady.’
- b. *I ilikiomeni kiria skothothike apo ton klefti.
 the elderly lady kill.NACT.PAST.3S by the thief
 ‘The elderly lady was killed by the thief.’
- c. Skotothika apo ti zesti simera/sti dulia simera.
 kill.NACT.PAST.1S by the heat today/at.the work today.
 ‘I was exhausted by the heat/ by work today.’

Turning 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). 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 interpreted as causers since they are rather abstract, and as a result can happily co-occur with anticausative predicates.”³

- (4) a. *O Kostas skothothike apo ton Giani.
 the Kostas kill.NACT.PAST.3S by the John
 ‘Kostas was killed by John.’
- b. O Kostas skothothike apo tus echthrus.

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 Odisseas skothothike apo ton idhio tu ton jo.
 the cunning Ulysses killed.NACT.PAST.3S by the own his. GEN the son
 ‘The cunning Ulysses was killed by his own son.’

³ Note that in previous work, Alexiadou and Anagnostopoulou (2009) have argued that Greek *by*-phrases can only be agentive.

- the Kostas kill.NACT.PAST.3S by the enemies
 ‘Kostas was killed by the enemy.’
- (5) a. * To spiti kaike apo ton Kosta.
 the house burn.NACT.PAST.3S by the Kosta
 ‘The house was burnt by Kosta.’
- b. To spiti kaike 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 considerable subset of them 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, 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 adjunct 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 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 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,⁴ 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:

- (6) I ghrafi afti apokriptoghrafithike 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 vraveftike apo tin vasilisa?
who was the young Cypriot who award.NACT.PAST.3S by the queen
'Who was the young Cypriot woman who was awarded by the queen?'
- (8) I meghali ethusa dhiakosmithike apo ton Italo architektona Cappellaro.
the big auditorium decorate.NACT.PAST.3S by the Italian architect Cappellaro
'The big auditorium was decorated by the Italian architect Cappellaro.'
- (9) To moro egatalifthike apo ti mitera tu sto proavlio.
the baby abandon.NACT.PAST.3S by the mother its.GEN at.the yard
tu nosokomiu
the hospital.GEN
'The baby was abandoned by its mother at the yard of the hospital.'
- (10) Ichografithike apo ton Marko ke to traghudhise
record.NACT.PAST.3S by the Markos and it sing.ACT.PAST.3S
o Stratos Pagiumtzis.
the Stratos Pagiumtzis
'(It) was recorded by Markos (Vamvakaris), and Stratos Pagiumtzis sang it.'

⁴ The corpora are available at: <http://www.sek.edu.gr/> (cf. Goutsos 2010).

We noted 210 such instances of different verbs in the passive 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 definites which do not refer to individuals, as in (11), organizations/institutions, as in (12), or indefinite plural nouns as in (13) 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 enepnefse to dhimotiko tragudi,
 the cruel his.GEN death that inspire.ACT.PAST.3S the folk song,
 ipirkse meghali simfora ke thrinithike apo ton lao.
 is.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 nomosxedhio den egrithike apo ton OIE.
 the bill not approve.NACT.PAST.3S by the UN
 ‘The bill was not approved by the UN.’
- (13) Ta omirika epi dhen dhimiurjithikan apo anthropus.
 the homeric epics not create.NACT.PAST.3S by people
 ‘The Homeric epics were not created by people.’

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. In what follows, we focus on these *by*-phrases, and we show that they behave as arguments, being able to have different theta-roles, just like the external arguments of the corresponding actives, and to bind anaphors, in contrast to adjuncts.

3. *By-phrases and Theta-Roles*

The previous section showed that Greek *by*-phrase can indeed be agentive. Here, we illustrate that, exactly like the external arguments in the active, *by*-phrases can bear different theta-roles other than this of the agent and they can host different kinds of DPs, and even idiomatic expressions. Thus, the *by*-phrases in (14,15-16) are experiencers and recipients respectively (cf. Alexiadou and Anagnostopoulou 2009, Alexiadou et al. 2015), but they can also be causers or instruments (cf. 17-18). (19) shows that an idiomatic expression within *by*-phrases.⁵ So, the Greek *by*-phrases are no different from the English *by*-phrases which have been shown to exhibit identical behavior in this respect (cf. Jaeggli 1986:599, Collins 2005: 82-83).

- (14) I Maria aghapithike 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 misithike apo ton spudheo skinotheti.
the movie that hate.NACT.PAST.3S by the important director
'The movie that was hated by the important director.'
- (16) To ghrama paralifthike apo ton Emona.
the letter receive.NACT.PAST.3S by the Emona
'The letter was received by Emonas.'
- (17) I fotia proklithike apo ta kalodhia tis DEI.
the fire cause.NACT.PAST-3S by the cables the DEI.GEN
'The fire was caused by the cables of DEI (electricity company).'
- (18) I epifania tha kopi ce tha
the surface will cut.NACT.PAST.3S and will
charakti apo to laser.
engrave.NACT.PAST.3S by the laser
'The surface will be cut and engraved by the laser.'

⁵ (19) is accepted with the characteristic intonation of ironic speech.

- (19) Tha enimerothike apo kapjo pulaci.
must inform.NACT.PAST.3S by some little.bird
'He must have been filled in/informed by some little bird.'

We argue that the fact that the theta-role of the *by*-phrase can vary with the verb is not accidental. It shows that the *by*-phrase merges as an external argument, and that it is assigned the theta-role that the corresponding external argument of the active is assigned. Now, restricting our attention to agents, we argue following UTAH (Uniformity of Theta-Assignment Hypothesis; Baker 1988:46, 1997:74), that the *by*-phrase can be an agent because 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 on theta-role assignment in the passive 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 manner 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.

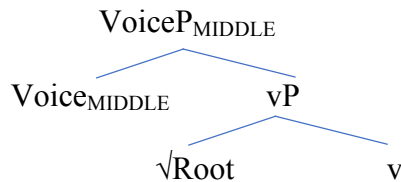
4. Synthetic Morphology and VoiceP

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. Moreover, they propose that the non-active voice morphology in Greek marks the absence of Spec VoiceP. This is formally captured by the Spell Out rule in (20) (see also Embick 1998 for similar assumptions). The Voice head to which this rule actually refers is

Voice_{MIDDLE}, following proposals in Alexiadou and Doron 2012, and is indicated in the tree in (21). Voice_{MIDDLE} is assumed to introduce an external argument variable and to existentially bind it at the same time.

(20) Voice -> Voice[NonAct]/ ___ No DP specifier (Alexiadou et al. 2015:102)

(21) 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 (20) 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.⁶ 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 first, we come to the following conclusion:

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

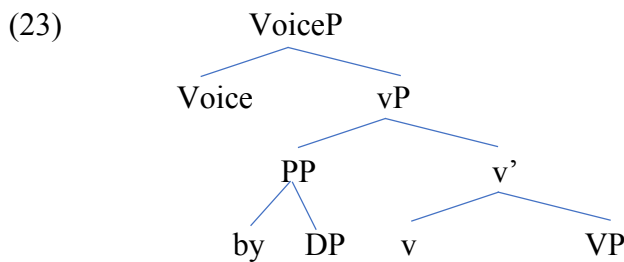
Merchant (2013:98) is led to similar conclusions, based on VP-ellipsis facts: “The

⁶ 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.’

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.”⁷

Even though we have rejected (20), we have not replaced it with some other theory of non-active voice in Greek. Our claim in (22) admittedly needs to be supplemented with some adequate theory of the distribution of non-active voice in the future.

Given (22), the structure for the Greek passive consistent with it is illustrated in (23). In what follows, we show that the structure in (23) finds support in binding facts of Greek reflexives.



5. 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

⁷ Jason Merchant (p.c) informs us that possible evidence in support of the separation of Voice and the head that introduces the external argument is that causative morphology can be found both in active and passive verbs of Greek e.g. the causative morpheme *-iz-* appears both in the active verb *filak-iz-o* ‘I imprison’ and the corresponding passive verb *filak-iz-ome* ‘I am imprisoned’. Moreover, *-ome* of *filak-iz-ome* encodes non-active morphology. Given this, if the causative morpheme lexicalizes the head that introduces the external argument, then, the head that determines Voice morphology should be a different head (see Merchant 2015 for more details on the morphology of the Greek passive). Note, however, that previous works have argued that v_{CAUS} heads are different from Voice, and that it is Voice that introduces the external argument, not v_{CAUS} (see Legate 2014: Chapter 5).

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 its 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.

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

Note that *o eaftos mu* can also have plural antecedents in which case either the possessive pronoun alone is plural or both the possessive pronoun and the *self* noun are pluralized. There might be interpretive differences between the two forms but this is not relevant to

the current discussion. Both plural forms of *o eaftos mu* require a c-commanding antecedent, as shown below.

- (26) a. Ta koritsia₁ kitazan ton eafto tus₁
the girls look.ACT.PAST.3P the self.ACC.S their.GEN
ston kathrefti.
in.the mirror
‘The girls looked at themselves in the mirror.’
- b. * I miteres ton koritsion₁ kitazan ton
the mothers the girls.GEN look. ACT.PAST.3P the
eafto tus₁ ston kathrefti.
self.ACC.S their.GEN in.the mirror
‘The mothers of the girls looked at themselves in the mirror.’
- (27) a. Ta koritsia₁ kitazan tus eaftus tus₁
the girls look.ACT.PAST.3P the self.ACC.P their.GEN
ston kathrefti.
in.the mirror
‘The girls looked at themselves in the mirror.’
- b. * I miteres ton koritsion₁ kitazan tus
the mothers the girls.GEN look.ACT.PAST.3P the
eafto tus₁ ston kathrefti.
self.ACC.P their.GEN in.the mirror
‘The mothers of the girls looked at themselves in the mirror.’

One property of *o eaftos mu* which makes it different from the English reflexive and has received little attention is that it has limited usages that 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 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 (28) 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 (29) the anaphors have antecedents that have been identified as empathy loci (Kuno 1987, Charnavel and Zlogar 2015, 18a,c).

- (28) a. *O Vasilis₁ ipe oti i vrochi katestrepse
 the Bill say.ACT.PAST.3S that the rain destroy.ACT.PAST.3S
 tis fotografies tu eaftu tu₁.
 the photos the self.ACC.S his.GEN
 ‘Bill said that the rain destroyed the photos of himself.’
- b. * O Janis₁ kafchithike oti i vasilisa kalese
 the John boast.NACT.PAST.3S that the queen invite.ACT.PAST.3S
 tin Anna ke ton eafto tu₁ ja potu.
 the Anna and the self.ACC.S his.GEN for drink
 ‘John boasted that the queen invited Anna and himself for a drink.’
- (29) * O Pavlos₁ duleve se ena panepistimio
 the Paul worked.ACT.PAST.3S at a university
 me ti jineka tu opu fisiki. opos o eaftos tu₁
 with the wife his.GEN where physicists like the self.ACC.S his.GEN
 echeran 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 implicated in English either. Using inanimacy as a tool to avoid logophoric usages is proposed in Charnavel and Sportiche (2016).

5.1 Reflexives bound by *by*-phrases in Greek

In this section we show that Greek reflexives can have a *by*-phrase antecedent. We start by presenting natural examples we found in google searches showing reflexives bound by *by*-phrases.

- (30) ta trofima sileghode apo enilika edoma₁
 the food collect.NACT.PAST.3P by adult insects
 ... ja tus eaftus tus₁.
 for the self.ACC.P his.GEN
 ‘The food is collected by adult insects for themselves.’
 (http://el.nsns.biz/osy_chem-pitayutsya-osy.html)

- (31) ena technito skafos pu kataskevastike apo tus theus₁
 an artificial craft that make.NACT.PAST.3S by the Gods
 ja tus eaftus tus₁.
 for the self.ACC.P their.GEN
 ‘An artificial aircraft that was made by the Gods for themselves.’
 (<https://apocalypsejohn.com/itan-vivlikos-leviathan-ena-amfivio-ufo-video/>)

- (32) to minima ... apostelete apoklistika apo kathe Learner₁
 the message send.NACT.PAST.3S exclusively by every Learner
 ston eafto tu₁.
 to.the self.ACC.S his.GEN
 ‘The message is sent by every Learner to himself.’
 (<http://artemis.cslab.ece.ntua.gr:8080/jspui/bitstream/123456789/13503/1/DT2017-0161.pdf>)

In the following examples we show that *by*-phrases are different in this respect from DPs hosted in any sort of adjunct PPs, which as we show, 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. 34b), *choris* ‘without’, a P followed by an accusative case

marked DP (cf. 33b, 34d), adjunct locative PPs (35b) and *mazi* ‘together’, a P followed by a functional preposition *me* and an accusative case marked DP (cf. 35d). The sentences below the ones testing binding from within adjunct phrases e.g. (33c), (34c), (34e), (35c) and (35e) show that ungrammaticality is only due to binding.⁸

- (33) a. Aftes i lisis protathikan apo tus psychotherapeftes₁
 these the solutions suggest.NACT.PAST.3P by the psychotherapists
 ja ton eafto tus₁.
 for the self.ACC.S their.GEN
 ‘These solutions were suggested by the psychotherapists for themselves.’
- b. *Aftes i lisis protathikan choris tus psychotherapeftes₁
 these the solutions suggest.NACT.PAST.3P without the psychotherapists
 ja ton eafto tus₁.
 for the self.ACC.S their.GEN
 ‘These solutions were suggested without the psychotherapists for themselves.’
- c. Aftes i lisis protathikan choris tus psychotherapeftes₁
 these the solutions suggest.NACT.PAST.3P without the psychotherapists
 ja ta provlimata tus.
 for the problems their.GEN
 ‘These solutions were suggested without the psychotherapists for their problems.’
- (34) a. Aftes i diataksis psifistikan 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.ACC.S their.GEN
 ‘These regulations were voted by the MPs of the government for themselves.’
- b. *Aftes i diataksis psifistikan 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 psifistikan eksetias ton vulefton
 these the regulations vote.NACT.PAST.3P because the MPs

⁸ The contrasts reported in this section reflect the judgments of the first and third author native speakers of Greek, the judgments of five participants at a Syntax Reading Group held at the University of Patras on September 2018 and five additional native speakers, non-linguists.

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 psifistikan 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.ACC.S their.GEN
 ‘These regulations were voted without the MPs of the government for themselves.’

e. Aftes i diataksis psifistikan 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.’

(35) a. Aftes i bluzes epilechtikan apo ta phedhja₁
 these the t-shirts select.NACT.PAST.3P by the kids
 ja ton eafto tus₁.
 for the self.ACC.S their.GEN
 ‘These t-shirts were selected by the kids for themselves.’

b. * Aftes i bluzes epilechtikan brosta/koda sta phedhja₁
 these the t-shirts select.NACT.PAST.3P in front/near at.the kids
 ja ton eafto tus₁.
 for the self.ACC.S their.GEN
 ‘These t-shirts were selected in front/near the kids for themselves.’

c. Aftes i bluzes epilechtikan brosta sta phedhja
 these the t-shirts select-NACT.PAST-3P in front at,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 epilechtikan mazi me ta pedhja₁
 these the t-shirts select.NACT.PAST.3P together with the kids
 ja ton eafto tus₁.
 for the self.ACC.S their.GEN
 ‘These t-shirts were selected together with the kids for themselves.’

e. Aftes i bluzes epilechtikan 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 binding facts 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.

5.2 Reflexives bound by *by*-phrases in English

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

- (36) 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.
- (37) 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 subjects of *send* or *paint* do 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 (38). 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 (38a) (their 59a), (38b) (their 59b) is marginal, however, and “is much less ambiguous than that of (38a)/59a: most speakers do not obtain the interpretation in which *himself* is coreferential with *John*, the *by*-passive agent of the sentence.”

- (38) 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 since they cannot be in a mental state (cf. Charnavel and Sportiche 2016).

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

- (40) a. The black hole₁ drew the planets into itself₁.
 b. The planets were drawn by the black hole₁ into itself₁.

- (41) a. The tornado₁ sucked the houses up into itself₁.
 b. The houses were sucked by the tornado₁ up into itself₁.

- (42) 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.⁹ Such examples are easy to find on the internet. All of the following examples are acceptable to the second author:

⁹ In an informal survey with a few native speakers we found that similar examples with inanimate antecedent DPs are acceptable in Greek, as shown below:

- (i) O server₁ estelne tis idopiisis ston eafto tu₁
 the server send.ACT.PAST.3P the notifications to.the self.ACC.S his.GEN
 ‘The computer server sent notifications to itself.’
- (ii) I idopiisis stelnodan apo ton server ston eafto tu
 the notifications send.NACT.PAST.3P by the server to.the self.ACC.S his.GEN
 ‘The notifications were sent by the computer server to itself’

- (43) You find yourself rising and being pulled by the sun₁ toward itself₁.
(<https://www.do-meditation.com/power-chakra-guided-meditation.html>)
- (44) The most direct way to determine it is to examine the far distant behavior of the magnetic field generated by the black hole₁ around itself₁.
(<https://slideheaven.com/black-holes-in-our-universe.html>)
- (45) which is thus an external demagnetising field applied by the magnet₁ to itself₁...
(https://e-magnetsuk.com/alnico_magnets/characteristics.aspx)
- (46) More recently oxytocin has been found to be released by the brain₁ into itself₁ during sexual intercourse,
(<https://books.google.com/books?isbn=9814488372>)
- (47) But soon also this will be sucked up by the earth₁ into itself₁.
(<https://gottfriedbennpoems.com/the-poems/>)
- (48) The investment made by the country₁ into itself₁ has paid back hundreds of times over, and will keep paying back.
(<https://www.entrepreneur.com/article/298127>)
- (49) The objects presenting themselves, in so far as they are sources of pleasure, are absorbed by the ego₁ into itself₁,
(<https://books.google.com/books?isbn=1416573593>)
- (50) For that which is decidedly thick and earthy in nature, and has entirely escaped alteration in the liver, is drawn by the spleen into itself;
(<https://faculty.humanities.uci.edu/bjbecker/PlaguesandPeople/week2j.html>)
- (51) These are income benefit or resources earned or generated by the organization from itself.
(<https://iproject.com.ng/accounting/accounting-as-an-inevitable-tool.../index.html>)

5.3 Discussion

In the previous sections we presented data from two languages, Greek and English, in which *by*-phrases, unlike DPs hosted in adjuncts, can bind non-exempt anaphors. Non-exempt anaphors like *o eaftos mu* or inanimate anaphors as in (47-54) need to be bound, given the following standard formulation of Principle A of Binding Theory (Koopman et al. 2013, 168):

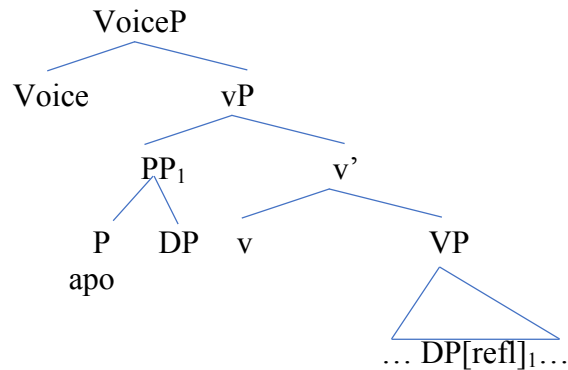
(52) Principle A: An anaphor must be bound in its domain.

In (33b) repeated below as (53b) the reflexive cannot be bound by *tus psichotherapeftes* ‘the psychotherapists’ because the latter is dominated by the PP *choris tus psichotherapeftes*. In (53a) the reflexive can be bound by the *by*-phrase:

- (53) a. Aftes i lisis protathikan apo tus psichotherapeftes₁
these the solutions suggest.NACT.PAST.3P by the psychotherapists
ja ton eafto tus₁.
for the self.ACC.S their.GEN
‘These solutions were suggested by the psychotherapists for themselves.’
- b. *Aftes i lisis protathikan choris tus psichotherapeftes₁
these the solutions suggest.NACT.PAST.3P without the psychotherapists
ja ton eafto tus₁.
for the self.ACC.S their.GEN
‘These solutions were suggested without the psychotherapists 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. Furthermore, we assume as in Alexiadou et. al. (2015) and Michelioudakis & Angelopoulos (forthcoming) that *apo*-‘by’ of Greek is a functional preposition. Hence, the structure we propose for Greek passives is in (54):

(54)



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 (53b) involving an adjunct PP:

(55) ...[without DP₁]. ...DP[refl]₁

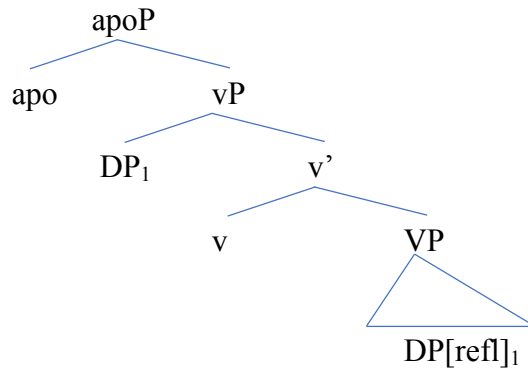
The DP complement of *without* does not c-command the reflexive, and therefore it cannot bind it. The PP itself is not an argument, hence, it should not be able to bind the reflexive in the first place.¹⁰

Another possible analysis of the passive, consistent with both the Greek and the English data, is that in Collins (2005), where *by* merges separately from its surface complement.¹¹

¹⁰ An alternative explanation as to why DPs within adjuncts do not bind reflexives is that adjuncts are different from arguments in that they are not introduced in the local domain where anaphors need to be bound.

¹¹ The structure in (56) is simplified. We leave open for future research the exact height at which *apo* merges.

(56)



In this analysis, the external argument in the passive is a DP in Spec vP just like the external argument in the active is. The difference between (54) and (56) is that in (54), the preposition ‘by’ and the following DP form a constituent, unlike in (56). Therefore, the prediction of the analysis in (54) is that [by DP] should pass various constituent structure tests. The choice between these two alternatives is non-trivial, and not directly relevant to the current issues, so we refer readers to Collins (2005) and Legate (2014) for related discussion.

Before closing this section, we would like to address two residual issues. First, passivized verbs precede *by*-phrases in Greek. In (54) and (56), 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 clarify our assumptions about the movement steps that the verb undergoes in the Greek passive. Following Rivero (1990:136-138), we assume that the verb in the Greek passive always moves at least as high as Voice. Given this, the verb precedes Greek *by*-phrases, because Voice in our analysis merges higher than the vP. Alternatively, the surface order is due to movement of the VP to a specifier higher than Spec vP, smuggling the internal argument à la Collins (2005).

Second, we have assumed that *o eaftos mu* is subject to standard Condition A, as in Angelopoulos and Sportiche (in progress). We further argued that data such as (53a) suggest that the *by*-phrase is an argument. This conclusion does not necessarily hinge on the particular theory of anaphora we employed. 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 usage, something we argued for here as well. This suggests that if the antecedent of *o eaftos mu* can be the *by*-phrase, which we showed it is, the *by*-phrase has to be an (co)argument, not an adjunct.

6. 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 Greek *by*-phrase is projected in the same manner 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 English and Greek 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. This is not the case with adjunct PPs.

Our results have a number of 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. Hence, our analysis 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 argue 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. This is supported by the fact that some intransitive inchoatives (which clearly have no external argument) bear non-active voice morphology, exactly like the non-active morphology of the passive. We propose the label of vP (following Chomsky 1995) as the projection which introduces external arguments.

At a last remark, in future research we would like to explore if the most peculiar aspects of the Greek passive discussed previously, such as the fact that some Greek verbs cannot be passivized at all, or that some of them cannot accept *by*-phrases, can be understood better in light of our conclusions from the behavior of agentive *by*-phrases.

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