

The compatibility of deverbal nominals and participles with manner/instrument PPs and agent PPs has been used (Alexiadou, Anagnostopoulou, and Schäfer 2009) as a diagnostic for agentivity, while the former at least are also a reliable diagnostic for eventivity, as they are in general incompatible with result nominals. While prepositions have in general been assumed to be adjunct structures licensed by the presence of certain projections such as Voice heads (Alexiadou, Anagnostopoulou, and Schäfer 2006), this paper, based on evidence from morphology, suggests that prepositions should be treated as probes, in the spirit of Kayne (2005), with the chunks of structure that nominals/participles and the respective verb phrases share being exactly the category that each of these Ps selects. The surface complement X of P originates within the verbal projection with which P is first-merged. Based on evidence from Greek deverbal compounds, participles and nominals, we then propose the following generalization:

(1) If and only if merger of P is blocked, then incorporation/compounding of X to the stem is possible. Consider the following contrast:

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|-----|----------|---------|-----------|-----------|---------|---------------------------------|
| (2) | therap | -ia | <i>me</i> | aktines | | ‘treatment with X-rays’ (Greek) |
| | √treat | -ment | with | X-rays | | |
| (3) | *therap- | -ef- | -tis | <i>me</i> | aktines | ‘therapist with X-rays’ |
| | √treat | Verb. | -er | with | X-rays | |
| (4) | aktino- | therap- | -ef- | -tis | | ‘X-ray therapist’ |
| | √ray | √treat | Verb. | -er | | |

While (2) is clearly a process nominal, (3) is not, as it also fails other diagnostics of eventivity, e.g. licensing of adverbials denoting duration. Interestingly, the instrument that fails to be licensed through a preposition in (3) is licit in (4), as part of a compound taking the same nominalizing suffix. An apparent exception to (1) is the availability of (5) as well:

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|-----|---------|---------|-------|--|-------------------|
| (5) | aktino- | therap- | -ia | | ‘X-ray treatment’ |
| | √ray | √treat | -ment | | |

Note, however, that (5), as opposed to (2), cannot be an AS-nominal and is thus not compatible with a process reading:

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|------|----------|---------|--------|---------|-----------|---|
| (5') | *aktino- | therap- | -ia | tu | karkinu | ‘X-ray-therapy of cancer’ |
| | √ray | √treat | -ment | of-the | cancer | |
| (2') | therap- | -ia | tu | karkinu | <i>me</i> | aktines ‘treatment of cancer with X-rays’ |
| | √treat | -ment | of-the | cancer | with | rays |

We couch our analysis of the internal structure of compounds largely in DM terms (cf. Harley 2009) and consider non-core arguments/modifiers such as instruments to be first merged as √(P)-adjuncts. The relevant P, needed for the Case licensing of the adjunct nominal, selects constituents that contain at least an event-denoting *v* or even constituents no smaller than VoicePs. The derivation proceeds exactly as in Kayne’s (2005) analysis of Romance *à/a*: the surface complement of P is attracted to the Spec of P itself or some Agr-related head and then P is either internally or externally merged on the top, followed by remnant movement of the verbal projection after merging the derivational suffix:

- (6) (i) [vEventP √therap-*v* [√P [DP aktines] [√P ~~√therap~~ ([DP tu karkinu])]]] → Merge P + Attract DP:
 (ii) [PP [DP aktines] [P' *me* [vEventP √therap-*v* [√P [DP aktines] [√P ~~√therap~~ ([DP tu karkinu])]]]]] → Head- movement of P and remnant movement:
 (iii) [XP [vEventP √therap-*v* [√P [DP aktines] [√P ~~√therap~~ ([DP tu karkinu])]]] [X' *me* [PP [DP aktines] [P' ~~*me* √EventP~~]]]]] → merger of *n* :
 (iv) [nP √therap-*v*⁰- [n⁰ -ia] [XP [vEventP ~~√therap-*v*~~ [√P [DP aktines] [√P ~~√therap~~ ([DP tu karkinu])]]] [X' *me* [PP [DP aktines] [P' ~~*me* √EventP~~]]]]]]]

When P is blocked, because of the absence of an eventive *v* (and hence Voice), then m-merger (Matushansky 2006) of a noun stem from the √(P)-adjunct position may be allowed as a last resort/PF-repair mechanism: so, in (4) and (5), √aktin(o)- may incorporate into √, prior to its successive cyclic movement up to *n* (which then has to be just PF movement). This can also account for the complete absence of compound verbs (7) incorporating instruments which are otherwise licit in compound non-AS-nominals (8), despite the (limited) availability of compound verbs incorporating internal arguments (9): (7) is always blocked by (10).

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|-----|-------------|-------|-----------|--|------------------------|
| (7) | *oksighono- | kol- | o | | ‘(I) weld with oxygen’ |
| | √oxygen | √weld | Infl.Suf. | | |

- (8) oksighono- kol- -i- tis ‘oxygen welder’
 √oxygen √weld Verb. -er
- (9) afiso- kol- o ‘stick posters’
 √poster √weld Infl.Suf.
- (10) kol- o *me* oksighono ‘(I) weld with oxygen’
 √weld Infl.Suf. with oxygen

Extending this to causer/agent PPs with nominalizations and adjectival participles forming adjectival participles appear to reinforce our hypothesis in (1). Consider the following cases of the nominal in (11-12) and the adjectival participle in (13-14):

- (11) to stolisma tis eklisias apo ta koritsia ‘the decoration of the church by the girls’
 the decoration of-the church by the girls
- (12) *koritso- stol- -is- ma ‘*girl decoration’
 √girl √decorate verbaliser Deriv.Suf.
- (13) stolis- -t- os (*apo angelo) ‘decorated (*by angel)’
 √decorate Deriv.Suf. Infl.Suf. by angel
- (14) angelo- stol- -is- -t- os ‘angel decorated’
 √angel √decorate verbaliser Deriv.Suf. Infl.Suf.

Incorporation of agents appears to be possible only when Voice(P) is missing, therefore *apo* ‘by’ in Greek selects VoicePs. While *-ma* in (11) licenses all sorts of evidence associated with the presence of a Voice head (agent phrases, and agent-oriented manner modification, see Alexiadou 2009), this is not the case with *-t-* in (13) (see Anagnostopoulou & Samioti 2012). In accordance with (1), incorporation is possible only in *-t-* (14) but not in *-ma-* (12). Nevertheless, the very availability of a potential agent incorporee in (14) suggests that there is a slot for external arguments, which has to be the Spec of v_{Event} (see Collins 2005) in the absence of Voice. Compounding of causers/agents in *-t-* adjectival participles is consequently possible only when an event entailment arises (15b), while the corresponding non-compounds may not have such entailments (15a). Note that the v_{Event} projection is added to the structure only when agents need to be introduced in the compound (15b). The non-compound *-t-* participle obviously lacks this projection (15a).

- (15) a. i areti ine dhidhak-t-i borun na su tin dhidhaksun
 ‘virtue is taught, people can teach it to you’
- b. i ghlosa tus ine mitrodhidhak-t-i, (*bori na tus ti dhidhaksi i mana tus)
 ‘their language is mother taught, it is possible for their mother to teach it to them’

If our assumptions are on the right track, we should expect that they could be extended to adjectival/resultant state passive participles in Greek and English. Why, then, is agent incorporation possible only in English (17), and why is (17) not blocked by (16)?

- (16) given by God (18) dos- -men- -os apo to theo ‘given by God’
 √give en- Infl.Suf. by the God
- (17) God-given (19) *theo- -dos- -men- -os ‘God-given’
 √God √give en- Infl.Suf.

We suggest that the English *by* is not like Greek *apo* ‘by’: *by* is indeed (in) Voice, triggering a smuggling derivation à la Collins (2005); like in verbal passives, *by* is optional, allowing for implicit agents (which Greek arguably lacks); in adjectival passives, in the absence of a smuggling derivation, an overt agent may be merged but *by* is not, hence the agent may incorporate. In Greek, on the other hand, *apo* ‘by’ is always forced in the presence of an overt agent and is always made possible by the obligatory presence of VoiceP in *-men-* (resultant) adjectival passives (Anagnostopoulou & Samioti 2012). Therefore, in such cases *apo* always merges and attracts the agent from Spec- v_{Event} , thus prohibiting its incorporation. On the other hand, the homophonous *apo* introducing causers in Greek is in fact only compatible with intransitive structures lacking Voice, such as target state participles (20a), but never with resultant state participles containing Voice (21b), while the pattern for incorporation is the reverse (20b/21a), as expected.

- (20) a. akoma fusko- menos apo ton aera ‘still pumped by the air.’ b. *aero- fusko- menos
 still √pump -ed by the air √air √pump -ed
- (21) a. (*akoma) thalaso- darmenos ‘still storm-tossed’ vs. b. *darmenos apo ti thalasa
 still √sea tortured tortured by the sea