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THE VP WITHIN PROCESS NOMINALS: EVIDENCE FROM ADVERBS AND THE VP ANAPHOR *DO-SO* ⋆

ABSTRACT. Recent accounts of process nominals postulate a VP within the nominalized structure. A verb becomes a nominal by a head raising operation to a nominal affix. This view contrasts with analyses of process nominals as (pure) nominals with partial verbal properties, originally due to Chomsky (1970). Contributing to this debate, we will argue that direct evidence indicates that English process nominals contain a VP. Our evidence comes from the distribution of adverbs on the one hand, and from the presence of the VP anaphor *do so* in process nominals on the other. We show that a portion of the verbal extended projection specifically excluding IP or CP is present in process nominals. An array of word order facts about process nominals falls into place when we further assume that the verb is raised from VP over the subject, the object, and adverbs, adjoining to a nominal affix. Our analysis moreover adds to the evidence for functional structure above VP and supports particular claims about the syntax-morphology interface.

INTRODUCTION

The verbal character of nominalizations has not been fully recognized. Why is there a grammaticality contrast between (a) and (b) examples of (1)–(3)?

(1)a.   Kim's explanation of the problem to the tenants thoroughly (did not prevent a riot).

   b.   ∗Kim's version of the event accurately (was a big help).

(2)a.   The occurrence of the accident suddenly (disqualified her).

   b.   ∗Kim's accident suddenly on the track (disqualified her).

(3)a.   Sue's exploration of Easter Island was impressive, then Amy's doing so was a real surprise.

   b.   *Sue's trip last May surprised us, Amy's doing so annoyed us.

Why do the synonymous adjectives and adverbs behave so differently in regard both to their position and interpretation?

(4)   [at the promotions and awards ceremonies]
   a.   A separate presentation of awards was attended by parents.
         [= promotions separate from awards]

   b.   A presentation of awards separately was attended by parents.
         [= each award given separately or promotions separate from awards]

We shall argue that all of these contrasts follow from a very simple syntactic analysis stating that derived process nominals ('process nominals' hereafter) such as *explanation*, *exploration*, but not underived nouns (e.g., *version*, *trip*), contain a syntactic VP. In other words, the distribution of adverbs and the possible presence of the verbal anaphor *do so* is correlated with the presence or absence of a VP in nominals. This evidence supports a syntactic account of process nominals, independently advocated by a number of recent works, including, among others, Hazout (1991), Valois (1991), Borer (1991, 1997), and Fu (1994).

We begin by sketching our analysis of process nominal. One of the important theoretical issues which bears on the derivation of process nominals relates to the analysis of morphologically complex words. For instance, derived words such as *explanation* or *explanatory* share important properties with their verbal root *explain*. Among these properties are the argument structure, shared by *explanation* and *explain* (in derived process nominals, but not in result nominals, see Grimshaw (1990)), the selectional properties, etc.

There have been basically two approaches to these shared properties. The first approach, sometimes referred to as lexicalist, was first suggested in Chomsky (1970) and was generally accepted during the 70s and the 80s (Thomason 1985; Sproat 1985; Randall 1988; Rozwadowska 1988; and others). According to the common execution of this approach, a lexical process mapping between *explain* and its derived forms assigns to the latter some or all of the lexical-semantic properties of the root. This approach clearly relies on a formal enrichment of the lexicon and of lexical operations.

The second approach, which we will refer to as the syntactic approach, was first proposed as early as Lees (1960), extended by Vergnaud (1973) for passives in the lexicon and advanced by the transformational analysis of compounds developed by Roeper and Siegel (1978) and more recently revived by Lebeaux (1986), Baker (1988), Murasugi (1990), Hazout (1991), Valois (1991), Borer (1991, 1999), Fu (1994), and others. Recent formulations of the syntactic approach posit a full phrasal syntactic projection of the stem within the structure of the derived word, relying on syntactic operations, likewise enriched, to join together the stem and the affix.

As pointed out in Chomsky (1970), there is no a priori reason to prefer an enriched lexicon over an enriched syntactic component, or vice versa. The issue is an empirical one. The choice between lexicalist and syntactic approaches cannot be made based on the fact, noted earlier, that derived words and their roots share the same selectional properties or, at times, argument structure, since both approaches can account for this fact. Indeed, choosing the correct analysis on the basis of empirical facts is at times rather difficult. For example, as Di Sciullo and Williams (1987) show, Baker's (1988) arguments for a syntactic approach of noun incorporation are also consistent with a lexicalist approach. The Case assignment difference between process nominals and action nominals discussed in Valois (1991) has also been given an alternative explanation, in Zubizarreta (1987) using lexical conceptual structure approach, and see Siloni (1994) for an attempt to explain the verbal properties of Hebrew process nominals within a lexicalist approach.

However, empirical evidence is, at times available. Specifically, three cross-linguistic analyses point to this same direction: (1) the presence of accusative Case and adverbial phrases in Arabic and Hebrew process nominals (Hazout 1991), (2) Case assignment differences between French process nominals and ordinary NPs (Valois 1991) and (3) the difference in constituent structure between Chinese process nominals and ordinary NPs (Fu 1994). While category-sensitive and constituent-structure sensitive evidence provides the strongest arguments for (or against) VP structure, other arguments, like the presence in process nominals of duration phrases in the sense of Grimshaw (1990), are merely consistent with VP structure, and could, in principle, be explained by a semantically-based approach as well. Therefore the discovery of explicit empirical data is a **decisive** ingredient in the argument, and we believe it renders the lexicalist approach untenable.

Is there, then, stronger empirical evidence for one approach rather than the other in English? We will argue that such evidence is available, and, more specifically, that English process nominals involve a syntactic VP

projection headed by the stem verb. Our analysis relies, at least in part, on providing new examples which show that empirical generalizations put forth by Newmeyer (1970), Chomsky (1970) and Wasow and Roeper (1974) were overstated:

- Previous research concluded that adverbs are incompatible with process nominals, but possible within sentential VP structures (Chomsky 1970). Since adverbs are VP modifiers, their putative absence in process nominals would suggest the absence of a VP. We will show that this generalization is empirically incorrect.
- *Do so*, typically assumed to be a VP anaphor, may take process nominals as its antecedent.
- The distribution of adverbs and *do so* points not only to the presence of VP within process nominals, but also to the absence of IP or CP projections within such nominals.[1]
- The distribution of adverbs and *do so* further provides evidence for head movement.

While our argumentation will be aimed at challenging the prevalent view in the field that process nominals are NPs, it is not our intention to address all the nominal features associated with process nominals: for instance, we do not address the lack of raising or *tough* constructions in process nominals as pointed out in Chomsky (1970). The evidence presented here is such that it requires a different view of process nominals, and by extension, of the interaction between word-formation and syntax. It is also worth noting that the account given in Chomsky (1970) for the ungrammaticality of process nominals with raising verbs and *tough* verbs is based on theoretical assumptions that are fundamentally incompatible with current syntactic models, making a new account necessary within any approach. As for the nominal features exhibited by process nominals, they can be worked out in any theory.

For the sake of discussion, we will compare the lexicalist, semantically based account of process nominals offered in Grimshaw's work (1990) and the syntactic account offered in Borer's (1993, 1997). We will discuss only those parts of these analyses that deal directly with process nominals, and our arguments are, in general, independent of the more particular details of these models. It is our belief that even if one or both of these specific models should turn out to fail for some reason, our conclusion will remain that VP is present in process nominals.

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[1] Where by IP we mean the highest (non-CP) sentential functional structure, typically associated with AgrSP or TP. Note that the specific label for that node is of little relevance from the perspective of the central argument advanced in this paper.

The main difference between Grimshaw's approach and Borer's approach to nominals concerns the absence or presence of a VP in process nominals. Grimshaw (1990), working within a lexicalist model, assumes process nominals to have an NP structure just like any other NP. Unlike regular referential NPs, however, process nominals have a semantic *Ev* (roughly *event*) argument, otherwise associated in the grammar with verbs, thereby accounting for their verbal properties. For Borer, process nominals contain a double structure: a VP headed by the verbal stem, and a dominating NP, headed by the nominal affix. (5) is an illustration of the relevant structure (but see below for elaboration):[2]

(5)

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        NP
        |        VP
        N       /  \
      -ation  DP    \
              V     DP
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investigate   the murder
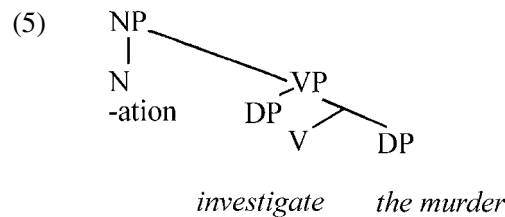
Setting aside for the time being the details of the structure in (5), note that the verbal root of the process nominal projects a VP dominated by the NP structure. Within syntactic approaches to process nominals, it is the presence of this VP that accounts for their verbal properties. In contrast a semantically based account like that of Grimshaw's attributes the verbal properties to the presence of the *Ev argument*.[3]

Therefore, it is fair to claim that the choice between these two models, and hence between a syntactic approach and a semantic approach, should be based to a large measure on how well they handle the verbal properties of process nominals. The core question then is: are the verbal properties demonstrably syntactic? Explicit syntactic evidence becomes decisive.

The paper is organized as follows. Section 1 presents the distribution of adverbs within process nominals. Section 2 presents the distribution of the VP anaphor *do so*, followed by a comparison of two competing theories in section 3 and a brief conclusion in section 4. Both adverbs and *do so* will be shown to support a syntactic approach to process nominals.

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[2] See also Roeper (1999) for extensive evidence of this assumption in an analysis that accounts for the verbal properties of *breakout* in contrast to *outbreak*.

[3] Alternatively, lexicalist accounts attribute the verbal properties of nominals, both process and result, to the percolation of the properties of the verb stem, guided by some principle of lexical inheritance. Note that such analyses must account for the distinctions between derived process nominals and derived result nominals by introducing an additional factor distinguishing between them, distinct from the properties of the verb, therefore reducing, in essence, to Grimshaw's system.

1. ADVERBS AND PROCESS NOMINALS

The presence of adverbs is a reasonably reliable indication of verbal structure. In fact, Chomsky (1970) argues, based on an assumed absence of adverbs in process nominals, against a syntactic analysis for process nominal (*John swiftly destroyed his notes./*John's swiftly destruction of his notes*).[4] Contrary to Chomsky (1970), we will show that adverbs are acceptable in some process nominals, therefore supporting a VP structure, or at the very least, removing a significant objection to its presence.

For many speakers of English, adverbs are acceptable in process nominals such as (6).[5]

(6)a.   (While) the removal of evidence *purposefully* (is a crime), the removal of evidence *unintentionally* (is not).

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[4] While it is widely assumed that adverbs are barred in process nominals, some work in support of underlying VP in nominals (cf. Kratzer 1994) cites Jespersen (1940) for the admissibility of adverbs in nominal gerunds (*V-ing of*):

(i)   The shutting of the gates regularly at ten o'clock had rendered our residences very irksome to me. (example from Jespersen)

[5] A reviewer has pointed out that nominalizations with adverbs tend to occur in subject position only, thus citing the contrast between (i) and (ii):

(i)   *I missed his resignation so suddenly.

(ii)   Jane's resignation so suddenly gives rise to wild speculation.

While the occurrence of nominalizations with adverbs in non-subject position is limited, it is not ruled out across the board as shown in (6d).

Moreover nominalizations have the same distribution as gerunds.

(iii)a.   We do not approve of Jane's resigning her job so suddenly.

   b. *   I missed Jane's resigning her job so suddenly.

It may well be that process nominals favor a 'the fact that' reading, which accounts for their distribution and their patterning with gerunds. Whatever the explanation, it has little effect on our argument here. If anything, the parallelism with gerunds that are nominals with an undisputed internal VP (Abney 1987: 171–173), provides prima facie support for our account.

b.   ?His explanation of the problem *thoroughly* to the tenants (did not prevent a riot).

c.   ?Protection of children *completely* from bad influence (is unrealistic).

d.   (I disapprove of) Jane's resignation so suddenly.

e.   Collaboration of the witnesses *voluntarily* (has greatly sped up the process).

While some speakers may find the process nominals in (6) odd, for all speakers there is a clear, sharp contrast between their admissibility in process nominals and in underived nouns or result nominals. Thus, compare the process nominal *explanation* in (7a) with its near synonym underived nominal *version* in (7b):[6]

(7)a.   His explanation of the accident *thoroughly* (did not help him).

b.   *His version of the accident *thoroughly* (did not help him.)
[compare: his thorough version of the accident]

A particularly interesting contrast is the one in (8a–b), between process nominals that are derived from a verb and event nominals that are underived (*simple event nominals*, in Grimshaw's terms).

(8)a.   His transformation into a werewolf so rapidly was unnerving.

b.   ??His metamorphosis into a werewolf so rapidly was unnerving.

The facts in (6)–(8) thus show that adverbs are not summarily excluded from process nominals. Since adverbs are one of the prime indicators of verbal structure, it must be concluded that there is verbal structure within process nominal. No such structure is present for the underived nouns *version* in (7b) and *metamorphosis* in (8b). As it turns out, however, the acceptability and distribution of adverbs within process nominals (and elsewhere) are governed by more complex factors. Based on the types of adverbs within process nominals and their positions, we will provide a more articulated structure for process nominals.

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[6] It might be suggested that the further away the adverb is from head noun, the more acceptable the utterance. However the contrast between (7a) and (7b) cannot be explained by any distance effect, since in both cases the adverb has equal distance to the head noun (separated by one NP).

1.1. *Sentential Adverbs vs. VP Adverbs*

Adverbs are typically divided into two major groups: sentential adverbs and VP adverbs (see Jackendoff 1972 for an adverb typology). While the former presumably adjoin to a sentence-level node, the latter are typically assumed to adjoin to VP.[7] Since these attachment sites are relatively uncontroversial, the distribution of adverb types within process nominals can shed some light on their structure.

In contrast to VP adverbs, sentential adverbs are not acceptable within process nominals. The adverbs in (6), (7a), (8a) above, *purposefully*, *unintentionally*, *completely*, *suddenly*, *thoroughly* and *rapidly*, are all VP adverbs. Their VP status can be shown by their possible placement between direct object and indirect object, barred for sentential adverbs:[8]

(9)a.   She explained the problem *thoroughly* to the tenants.

   b.   They cannot protect the children *completely* from bad influence.

(10)a.   *She explained the problem *presumably* to the tenants.

   b.   *They can protect the children *fortunately* from bad influence.

Sentential adverbs, on the other hand, are impossible in process nominals:

(11)a.   *His explanation of the problem *fortunately* to the tenants (did not cause a riot).

   b.   His removal of the evidence *presumably* (promised a lengthy trial).

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[7] Alternatively, and assuming a theory of adverb placement along lines advocated by Cinque (1998), the relevant functional structure would have to be associated with VPs in process nominals to accommodate the adverbs in (6). However, for VP adverbs, this functional structure would be 'closer' to the VP, while for sentential adverbs it would be higher, and, presumably, dependent on the existence of sentential functional structure (= IP).

[8] We are abstracting away from parenthetical adverbs, as in 'he explained the problem, presumably, to the tenants.' Note that these are much deteriorated inside process nominals. However, as the formation of parentheticals may involve a sentential structure anyway, this is not surprising.

A similar situation holds for nominal gerunds:

(12)a. *The giving of the books *fortunately* to the library (made it possible for us to go on working).
[compare: the fortunate giving of the books to the library]

   b. His removing of the evidence *presumably* (was severely criticized).

The contrast between VP adverbs and sentential adverbs suggests that process nominals and nominal gerunds do not contain a full sentential structure, but are restricted to phrases containing a VP or, as we will suggest below, a functional structure above the VP that licenses argument projection. Similar contrasts are observed for Hebrew by Hazout (1991) and for Chinese by Fu (1994). How can this contrast be handled by the two competing theories? Let us start with the syntactic approach.

Assuming that the absence of sentential adverbs **is** indicative of the absence of a full sentential structure within process nominals, why is it that process nominals cannot contain an IP or a CP as well? Specifically, why is it that (13a) or (13b), which would allow sentence adverbs, is an illicit structure?

(13)a.

b.
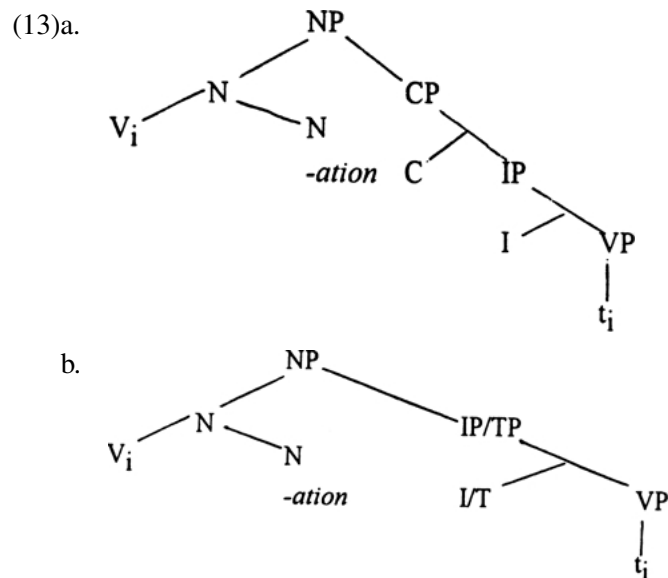
We propose that the structures in (13a–b) are barred because they involve head-to-head movement through C or T on to a lexical head outside

the clausal structure, an improper movement. Drawing a comparison with phrasal movement, suppose lexical heads are always A-type, while functional heads may be either A-type or A′-type. Specifically, we may assume that both C and T are A′ heads. On a par with phrasal movement, then, we expect licit movement from A-head to A-head, from A′-head to A′-head, or from A-head to A′-head, but not from A′-head to A-head. We therefore allow the movement of a lexical head (such as the verb) to all functional structures dominating it, including T and C, but movement of T or C to adjoin to a lexical head is illicit, as it involves the movement of an A′-head to an A-head. A similar account is put forth in Li (1990), where it is argued that restricting the movement of functional heads to lexical heads explains the absence of clausal CP/TP structure in complex causative predicates. It therefore follows that a nominalizer taking a CP or a TP as a complement will never allow the head of a subordinate V to incorporate to N, resulting in the absence of full sentential structure in derived process nominals, and the subsequent absence of sentential adverbs for these nominals.[9,10]

Now, how would a lexicalist, semantically based approach handle the contrast between the grammaticality of VP adverbs and the ungrammaticality of sentential adverbs in process nominals? Note first that the relative grammaticality of VP adverbs in derived process nominals is, to begin with, problematic within a lexicalist, semantically based approach, if the distribution of adverbs is strictly dependent on the presence of a syntactic VP. Thus at the very least, a lexicalist, semantically based approach must allow adverbs to be associated with a semantic (e.g., event), rather than syntactic (i.e., VP) configuration. Specifically, within Grimshaw's account, one would have to claim that adverbs are associated with the presence of the *Ev argument*. Presumably, within her model, it could be suggested that the presence of an *Ev* argument, common to the VP and to process nominals, can license, under certain conditions, some adverbs,

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[9] A reviewer notes that process nominals do allow temporal modifiers such as *yesterday*. If such temporal modifiers require the presence of a Tense node to be grammatical, their presence in process nominals would suggest the presence of a functional Tense node after all. Note, however, that the distribution of temporal modifiers such as *yesterday* is independent of a TP projection. They may clearly modify underived nouns which refer to a semantic event, where a Tense node is clearly implausible:

(i)   His class yesterday was a knockout.

(ii)   The fashion last year was so-so.

[10] In cases where VP has extended projections, which we will entertain, the extended projections should be treated quite differently from those associated with CPs or IPs, as they must be in any theory.

therefore accounting for the grammaticality of (6), (7a) and (8a) vs. the ungrammaticality of (7b) and (8b) above. Moreover, it appears possible, in principle, to capture the restriction barring sentential adverbs by claiming, for instance, that while VP adverbs are licensed by the presence of the *Ev* argument, the presence of a propositional phrase is required for the licensing of a sentence adverb.

However, there are two serious difficulties to such an account. First, a lexicalist, semantically based account must make an in-principle distinction between process nominals denoting an event (*exploration*) and underived nominals denoting an event (*trip*), as the latter do not allow adverbs. Other cases were noted in Borer (1999):

(14)a. *The race to the mountains deliberately.

   b. *His trip to Hawaii secretly.

The distinctions between the properties of event-denoting derived nominals and event-denoting underived nominals, surprising within a lexicalist, semantically based approach, are acknowledged, but remain unaccounted for, in Grimshaw (1990).

Second, any proposal along such lines would fail to account for the contrast in (15):

(15)   John's fortunate/*fortunately removal of the evidence (saved my life).

In (15), the difference between *fortunate* and *fortunately* is syntactic rather than semantic, since both express the speaker's point of view. If point-of-view modifiers require a proposition, we expect *fortunate* to give rise to precisely the same violation as *fortunately*. Note that any semantic distinction, such as event vs. non-event etc., is in principle not capable of distinguishing between adverbs and adjectives, in this case, as both function identically in this context. If one is ruled out on a semantic basis, the other should be as well. On the other hand, given a syntactic account, *fortunately* is excluded in process nominals not because semantic interpretation is not feasible, but because the syntactic environment required to license it as a sentence adverb is not met: there is no sentential projection in the structure.[11]

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[11] In turn, notice that the absence of sentence adverbs, as such, could not be construed as an argument against the presence of a VP projection. Sentence adverbs are likewise barred in gerunds, where the presence of a VP projection is not in dispute:

   (a)   *Kim's removing the evidence fortunately

Summarizing, the occurrence of VP adverbs vs. the absence of sentential adverbs argues for a VP structure and against a full sentential structure in process nominals. The contrast further argues for a syntactic, rather than a semantic approach to the distinction between derived process nominals and underived nominals.[12]

1.2. *The Position of Adverbs in Process Nominals*

1.2.1. *The Position of Adverbs as a Constituency Test*
As it turns out, the position of adverbs as well as aspectual modifiers (in the sense of Grimshaw 1990) within process nominals provides additional evidence for the existence of an underlying VP within such nominals. In order to see this, consider the possible positions of adverbs and aspectual modifiers within these nominals, given in (16)–(19):

(16)a. *His deliberately removal of the evidence (resulted in obscuring the case).

   b. *His removal deliberately of the evidence (resulted in obscuring the case).

   c. His removal of the evidence deliberately (resulted in obscuring the case).

(17)a. *The enemy's destruction from early spring to late fall of the city

   b. The enemy's destruction of the city from early spring to late fall

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(b)   *Kim's fortunately removing the evidence

(c)   *Kim's removing, fortunately, the evidence

It thus appears that the presence of sentence adverbs is dependent on the presence of a full sentential projection, and is clearly independent from the presence or absence of a VP. As above (cf. fn. #5), the parallelism with gerunds provides prima facie support for the existence of a VP.

[12] A reviewer suggests that the distribution of adverbs in process nominals may be indicative of an elided relative clause that the adverb modifies (e.g., *the removal of the evidence* ~~which was done~~ *purposefully*). Setting aside the problems associated with constraining such ellipsis, note that such an explanation could not account, in principle, for the difference in acceptability between VP adverbs and sentential adverbs, which are clearly licensed in relative clauses, including reduced ones.

(18)a. *The promptly arrival of the trains at the station

    b. *The arrival promptly of the trains at the station

    c. The arrival of the trains promptly at the station

    d. The arrival of the trains at the station promptly

(19)a. *The arrival from morning to noon of the trains at the station

    b. The arrival of the trains from morning to noon at the station

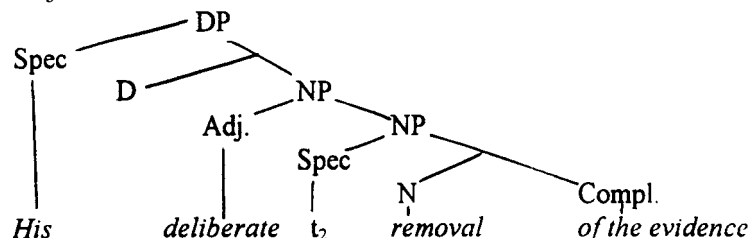   c. The arrival of the trains at the station from morning to noon

Note first that the distribution of adverbs is distinct from that of adjectives, including those with equivalent interpretations:

(20)a. His deliberate removal of the evidence (resulted in obscuring the case).

    b. *His removal deliberate of the evidence (resulted in obscuring the case).

    c. *His removal of the evidence deliberate (resulted in obscuring the case).

(21)a. The prompt arrival of the trains at the station

    b. *The arrival prompt of the trains at the station

    c. *The arrival of the trains prompt at the station

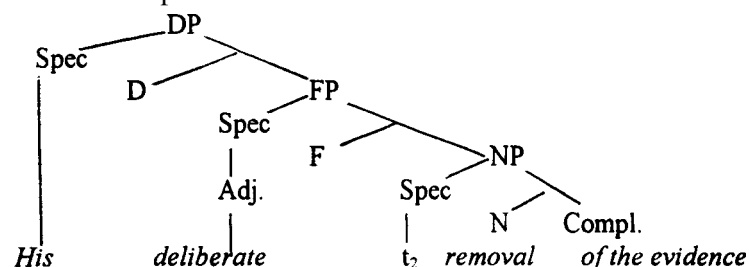   d. *The arrival of the trains at the station prompt

The non-occurrence of pre-head adverbs together with their occurrence in the environments in (16)–(19) is not readily explainable within a lexicalist, semantically based approach. Proponents of the lexicalist, semantically based approach could perhaps account for the actual availability of adverbs in (16c) and (18c–d) by assuming that the *Ev* argument may license an adverb on a par with the counterpart of *Ev* within the VP (although as discussed above, this would leave unexplained the prohibition on sentential adverbs). However, given an NP structure, the exclusion of such adverbs

from pre-nominal positions together with their grammaticality in the post-verbal positions in (16) and (18) is hard to account for. Consider why this is so. Typically, it is assumed that adjectives are either adjuncts or alternatively, they occupy specialized functional specifiers (cf. Valois 1991). Thus relevant possible structures would be as in (22)–(23):[13]

(22)   Adjunction to NP:

Spec — DP
D — NP
Adj. NP
Spec N Compl.
His   deliberate   t₂   removal   of the evidence

(23)   Functional Specifiers:

Spec — DP
D — FP
Spec F NP
Adj. Spec N Compl.
His   deliberate   t₂   removal   of the evidence

Similar structural assumptions are typically made for the structure of adverbs: adverbs are either adjoined or occupy a specialized functional specifier (cf. Cinque 1998). However, in view of this structural parallelism, the ungrammaticality of the placement of adverbs precisely where adjectives are licit remains unexplained. There is little reason to allow an adjective such as *deliberate* in [Spec, FP] in (23), but to block its adverbial correlate, *deliberately*, in the very same position. On the other hand, adverbs can occur where adjectives are impossible, that is, at the right periphery of the nominal (e.g., (16c)) or between the complements, as in (18c). In these positions, adjectives are impossible, as (20)–(21) clearly show. If all there is to process nominals is an (extended) nominal projection with an *Ev* argument, such an asymmetry in the placement of

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[13] As the functional structure associated with nominals is outside the scope of this paper, we will not elaborate on the specific nature and labels of the functional projections in (22)–(23). For some discussion of the functional structure associated with nominals and the movement of N through that functional structure see Ritter (1991), Longobardi (1994), Li (1997) and Borer (1999) among others.

modificationally equivalent adjectives and adverbs is neither anticipated nor explained. On the other hand, if process nominals include a nominal projection dominating a verbal projection, the distribution of adjectives and adverbs receives an immediate and a natural explanation. Adverbs are barred pre-nominally, in either (22) or (23) type structures, quite simply because adverbs are never licensed pre-nominally. Adjectives are barred in the right periphery and intervening between a head and a complement because, equally simply, post-nominal adjectival modification is generally impossible and in case of nominalization, that would entail an adjectival modification of a VP structure, which is never possible. Nothing else needs to be said.

As it turns out, the positioning of adverbs, when viewed from a different perspective, may provide us with evidence for the constituent structure of process nominals. Suppose, for the sake of this illustration, that adverbs and adjectives are adjoined to maximal projections. If that is indeed the case, we must postulate the (partial) structure in (24) for, e.g., (18c):[14]

(24) $[_{ZP}$ the $[_{YP}$ observed $[_{YP}$ arrival ... (of the trains) $[_{XP}$ promptly $[_{XP}$ at the station]]]]]

Setting aside for a moment the position of the subject *of the trains*, note that the structure in (24) is precisely the one given by the V-raising analysis, assuming XP to be a member of the VP extended projection headed by the verb and YP to be a member of the NP extended projection headed by the affixal nominalizer *-al*. For such a structure, the positioning of both adverbs and adjectives within process nominals is fully consistent with their adjunction to the maximal projection that they modify. If we take YP in (24) to be an NP and XP to be a VP, the actual labels associated with (24) would be as in (25a), derived from (25b) (but see below for some modification):

(25)a. $[_{DP}$ the $[_{NP}$ (observed) $[_{NP}$ arriv-al ... $[_{VP}$ promptly $[_{VP}$ ... t_v at the station]]]]]

   b. $[_{DP}$ the $[_{NP}$ (observed) $[_{NP}$-al ... $[_{VP}$ promptly $[_{VP}$ ... arrive at the station]]]]]

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[14] As the reader will no doubt realize, similar results follow if we assume that adverbs and adjectives occupy their own specialized functional specifiers. In that case, two distinct functional complexes would be projected dominating the VP and the NP respectively, accommodating the adverb and the adjective.

1.2.2. *The Pre- and Post- Head Positions and Their Interpretation*
Adverbs and adjectives often cover the same semantic ground, but they are structurally distinct and may have different interpretations corresponding to their distinct structural positions. First, as mentioned before, adjectives and adverbs may co-occur within the same nominalization with different interpretations as in (26)–(27):[15]

(26)a. His **careful** destruction of the documents **immediately** (saved his reputation).

b. His **immediate** destruction of the documents **carefully** (saved his reputation).

(27)a. His **thorough** presentation of the results **slowly** (made an impression).

b. His **slow** presentation of the results **thoroughly** (made an impression).

Second, in nominalizations, adverbs but not adjectives, can modify objects. In (28), although both *individually* and *individual* are possible, only *individually* may modify the object *these documents*. Similar facts hold for *proportionally* and *proportional* in (29):

(28)a. The committee's destruction of these documents **individually** (casts doubt on the validity of the process).

b. *The committee's **individual** destruction of these documents (casts doubt on the validity of the process).
(Intended reading: destroy those documents one by one).

(29)a. His discussion of the results **proportionally** (pleased everyone).

b. *His **proportional** discussion of the results (pleased everyone).

In contrast, an equivalent adverb occurring in a preverbal position **can** be associated with an object, as shown in (30).

(30) The committee individually destroyed these documents.

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[15] For the co-occurrence of adjectives and adverbs in Hebrew see Hazout (1991); Borer (1993).

In summary, pre- and post-nominal modifiers differ not only in category (adjectives vs. adverbs) but also in interpretation. A pre-nominal adjective in process nominals, unlike its adverbial counterpart in a post-nominal or in a preverbal position, cannot modify the object. Our verb raising structure offers a simple solution. Namely, with a maximal constituent boundary between the nominal head and the post-nominal positions in process nominals, a constituent which we argue is a VP, adverb and object are in the same maximal projection excluding pre-nominal adjectives. A rule can then be stated, an NP is modifiable by a modifier in its immediate maximal projection. Objects then can be modified by a modifier within their maximal projection, which includes post-nominal adverbs and preverbal adverbs but not pre-nominal adjectives.

1.2.3. *The Positions of Subject, Object and Adverbs*

The presence and interpretation of adverbs within nominalizations varies from very clear cases to those where both the grammaticality and the interpretation become difficult to judge. In what follows, we present some data on the intermediate position of adverbs between the head noun and subject or object. Going beyond our core claim for the presence of a VP, we also touch upon the issue of higher functional structure within nominalizations, analyses as pursued, in slightly different ways, by Borer (1999), Marantz (1999), and van Hout and Roeper (1999).

Let us now turn to the position of the subject of the embedded VP, left obscure in the discussion above. As discussed in section 1.2.1, in process nominals adverbs have a distribution similar to their distribution in sentential VPs. The one position from which an adverb is excluded, however, is the intermediate position between the head noun and any direct argument:[16]

(31)a. *The collaboration swiftly of the witness (sped up the process).

   b. *The resignation suddenly of all the cabinet members (stunned the nation).

(32)a. *John's removal immediately of the garbage (made the investigation difficult).

   b. *Mary's explanation promptly of the accident to the tenants (did not prevent a riot).

---

[16] While the facts in (31) might appear to lend themselves to an easy account if it is assumed that adverbs are adjoined to V' and the VP-internal subject remains in situ, note that this account would predict, contrary to fact, the full grammaticality of (32).

(33)a. *The removal immediately of the garbage (made the investigation difficult).

   b. *The explanation promptly of the accident to the tenants (did not prevent a riot).
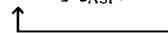
   If we are to take the position of adverbs at all seriously and assume that adverbs are left-adjoined to VP, it follows that both subjects and objects (but not PP complements, cf. (18), (19) above) are outside the VP. However, this is hardly a new or surprising result. Within current theories of argument placement, direct arguments such as subject and object are explicitly assumed to be outside the VP, occupying functional specifiers in the VP extended projection.

   In view of this, consider an elaboration on the structure in (24). Specifically, let us assume that the VP structure embedded in process nominals includes functional projections that dominate the VP. In much current research it is assumed that the projection of the external argument involves a specialized functional structure (cf. Borer 1994; Kratzer 1994; Harley 1995; among others). In Borer (1994, 1998) it is further argued that aspectual functional structure is responsible for the interpretation of all direct arguments. Specifically, the so-called external arguments are interpreted in the functional specifier of a process node (ASP_P; alternatively, v). Internal arguments, on the other hand, are interpreted in the functional specifier of a potentially telic node (ASP_E) (and see also van Hout 1992, 1996). A representation of the relevant verbal structures is given in (34)–(35):[17]

(34)a. The train arrived

   b. $[_{TP}$ **[NOM]** $[_{FP}$ *arrived* $[_{ASP E'}$ *the train$_1$* $[_{VP}$ t$_V$ $\langle$t$_1\rangle$ $]]]]]$

(35)a. Kim destroyed the stew.

   b. $[_{TP}$ **[NOM]** $[_{ASP P'}$ *Kim$_1$* $[_{FP}$ *destroyed* $[_{ASP E'}$ *the stew$_2$* $[_{VP}$ t$_V$ $\langle$t$_1$,

       t$_2\rangle$ $]]]]]]$

In Borer (1999), this analysis is extended to process nominals (and see also Marantz 1999). According to this extension, direct arguments do not

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[17] Crucially, in Borer (1994, 1998) it is assumed that the traces in the VP are neither ordered, nor hierarchically represented with respect to each other, thereby avoiding issues of locality.

remain in the VP in process nominals, but rather, they, too, are raised
to the specifier of the relevant aspectual nodes, on a par with raising in
(sentential) verbal structures. The resulting derivation is as in (36):[18]

(36)a.

's observed   -al   promptly remove <Kim; the evidence>

b.

's observed remov-al t_V t_V promptly t_V <Kim; the evidence>

c.

Kim_l 's   observed t_l removal t_l t_V t_V promptly t_v, <$t_{l,}$ the evidence>

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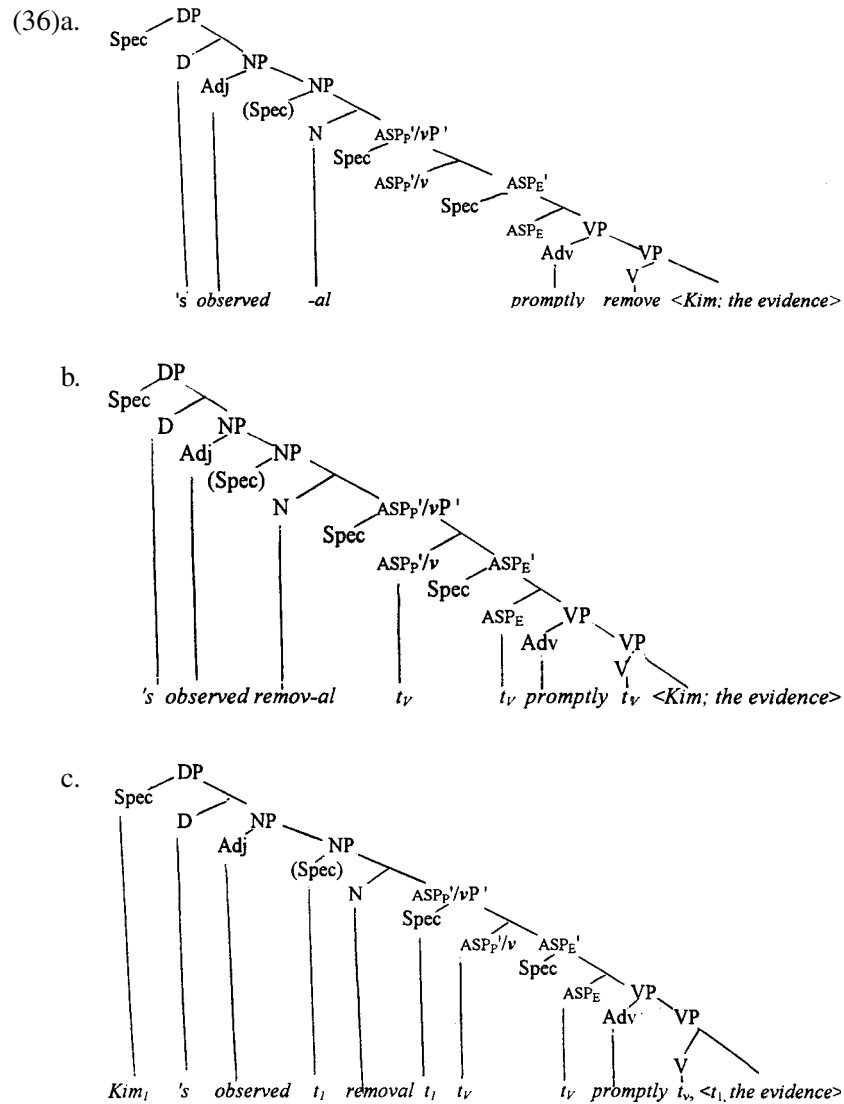
[18] As before, for reasons of exposition, the structure in (36) uses adjunction rather
than specialized functional specifiers for adjectives/adverbs. An execution using functional
specifiers would not change the nature of the argumentation or the conclusions here in
a significant way. We are setting aside here the details of the execution of *of*-insertion,
available in English in [Spec, ASP_E] in structures such as those in (36). See Borer (1999)
for discussion.

d.
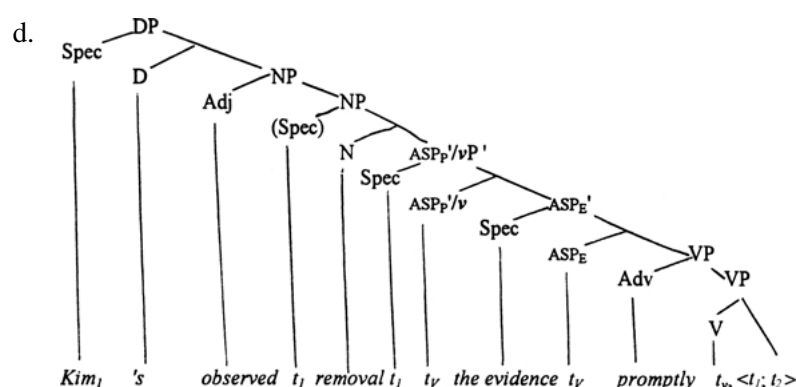
Since the detailed motivation of functional structure above the VP in (34)–(36) is clearly outside the scope of this paper, the reader is referred to the references cited for much discussion on the topic. In turn, note that once such a functional structure is assumed, the movement of both subject and direct object in process nominals follows from the fact that they have argument structure properties identical to those of sentential VPs. In fact, whatever structure licenses the projection of arguments within full sentences is expected to occur within process nominals, if the arguments are to receive the same interpretation.

Such a movement, coupled with a VP-adjoined adverb, would predict precisely the range of word orders we get in nominals:[19,20]

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[19] Crucially, we assume that PPs do not move outside the VP.

[20] Some speakers find N–Adverb–Object orders better than N–Adverb–Subject orders (thanks to Peggy Speas for pointing this out to us). Interestingly, for such speakers, the marginality of the examples in (32) and (33) contrasts with the clear ungrammaticality of the word order V–Adverb–Object in (36b):

(i)   *Mary removed promptly the garbage.

The structure in (36) does not predict this contrast, because the Adverb is VP adjoined and both subject and object have move out of the VP. Possibly, for these speakers, process nominals have a structure similar to the structure that generates sentential ADV–V–Object sequence (*John promptly remove the garbage*). That is, the adverb is adjoined to the intermediate projection above object and below the subject, in what is represented in (ii).

(ii)   [DP [NP N[ASPP′ (subject) [FP adverb [FP V [ASPE′ (object) [VP (adverb) [VP tV …]]]]]]]]

Regardless of the nature of FP in (ii), it does appear to be present in sentential structures, but, by and large, to be missing from process nominals on a par with other sentential functional nodes such as CP and IP.

(37)a.   N–Subject–Adverb

    b.   N–Object–Adverb

    c.   N–PP–Adverb (assuming right adjunction to VP)   (18d), (19c)

(38)a.   *N–Adverb–Subject   (31)

    b.   *N–Adverb–Object   (32), (33)

    c.   N–Adverb–PP   (18c), (19b)

1.3. *A Summary of the Section on Adverbs*

We have argued that the presence of adverbs in process nominals strongly supports the presence of an underlying VP in these nominals. Our evidence was based on three facets of the behavior of adverbs:

(a) The occurrence of adverbs in and of itself strongly suggests the existence of a verbal constituent. Furthermore, the co-occurrence of adverbs and adjectives in the same process nominal (as in (26)–(27)) suggests that process nominals must be analyzed as containing both nominal and verbal structure simultaneously.

(b) The positioning of the adverbs argues for a constituent boundary in a position which is incompatible with an exclusively nominal structure, but is fully compatible with the existence of an extended VP projection embedded under N′.

(c) The absence of speaker-oriented adverbs vs. the presence of VP/manner adverbs, on the one hand, and the possibility of generating both speaker-oriented adjectives and manner adjectives on the other hand are easily explainable in terms of the embedded VP hypothesis, suggesting that only part of the VP extended projection is projected, barring, specifically, TP (or IP) as well as any other functional nodes which are linked to sentential interpretation and which structurally license sentential adverbs. Within a semantically based approach, such a pure structural account is not possible and no ready explanation is available.[21]

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[21] For reasons that are not predicted by the present account, and which we do not understand, the movement of the subject from the embedded VP within process nominals does not license a floated quantifier:

2. PROCESS NOMINALS AND *Do So*

2.1. *Process Nominals as the Antecedent of Doing So*

Let us first justify the connection between *do so* and a VP antecedent. Hankamer and Sag (1976) show that *do so*, as opposed to *do it*, needs an overt linguistic antecedent. The antecedent in (39) is linguistic while that in (40) is pragmatic. *Do so* can only occur in the former while *do it* can occur in either.

(39)   Linguistic antecedent

Hankamer: I'm going to stuff this ball through a 6-inch hoop.

Sag: I don't believe that you can [do so].
            I don't believe that you can [do it].

(40)   Pragmatic antecedent:
            [Hankamer attempts to stuff this ball through a 6-inch hoop]

Sag: #I don't believe that you can [do so].
            I don't believe that you can [do it].

   Not only does *do so* need an overt linguistic antecedent, but it also requires its antecedent to be bigger than V, as shown by the underlined

(i) a.   *The refugees$'_2$ deportation all$_2$ by the army

   b.   *The soldiers$'_2$ deportation all$_2$ of the refugees

   c.   *The deportation of the refugees$_2$ all$_2$ by the army

Note, however, that movement within NP in general does not license floated quantifiers, expected of possessors if they move to [Spec, DP], and of complements whenever they appear pre-nominally:

(ii) a.   *[$_{DP}$ the children's$_2$ [$_{NP}$ all$_2$ pictures of their dogs]

   b.   *[$_{DP}$ the dogs'$_3$ [$_{NP}$ (all$_3$) pictures (all$_3$)

Further, given the phrase structure in (36), it is clear that floated quantifiers could never be licensed in [Spec, VP] (or one would wrongly predict the grammaticality of *the soldiers$_i$ deported the family all$_i$). It would appear, then, that floated quantifiers, contrary to previous accounts, may only be licensed in functional specifiers associated with the VP extended projection. Given, however, the impossibility of floated quantifiers within process nominals, we must conclude that such licensing is restricted to some functional specifiers but not to others, and that these functional specifiers are co-extensive with those licensed in sentential structures, but not within process nominals.

portion in (41) (and see Speas (1990) for arguments that it is a VP rather than V′).

(41)a.   He <u>removed the garbage yesterday</u> and I did so too.

  b.   He <u>removed the garbage</u> yesterday and I did so today.

  c.   *He <u>moved</u> the green container and I did so the black container.

Note that translated into our terms, rather than VP or V′, what counts as the antecedent of *do so* should at least be, replacing VP or V′, the extended projection above VP but below IP, including ASP_E responsible for licensing the subject and the object respectively. In what follows, we will still use the terms $VP/V′$ to be consistent with tradition, with the understanding that VP/V′ stands for the relevant portion of the verbal extended projection.

The distribution of *do so* has been traditionally used as a test for the presence of a non-terminal V constituent (see Lakoff and Ross 1972). Now if *do so* must have a VP/V′ antecedent, the prediction for process nominals is that if they contain a VP/V′, they should be able to serve as the antecedent of *do so*. This prediction is borne out. Consider (42) and (43). The process nominals in (42), where the anaphor *doing so* takes as its antecedent a process nominal (underlined portion), are acceptable, whereas in (43) the underived nouns (*version* or *accident*) cannot serve as the antecedents of *doing so*.

(42)a.   Sam's <u>destruction of his documents</u> this morning was preceded by Bill's doing so.

  b.   His <u>removal of the garbage</u> in the morning and Sam's doing so in the afternoon were surprising.

(43)a.   *Sam's <u>version of the event</u> and Bill's doing so were surprising.

  b.   *Kim's <u>accident</u> in the morning and Sue's doing so in the evening were not coincidences.

Recorded occurrences of process nominals as antecedents of *doing so* are reported by Kehler and Ward (1995):

(44)a.   The <u>defection</u> of the seven moderates, who knew they were incurring the wrath of many colleagues in *doing so*, signaled that it may be harder to sell the GOP message on the crime bill than it was on the stimulus package.   (Washington Post)

   b.   Even though an Israeli <u>response</u> is justified, I don't think it was in their best interests to *do so* right now.   (token provided by Dan Hardt)

(44b), note, is of particular interest, as in this case, the process nominal is licensing the occurrence of *do so* in what is uncontroversially a VP: in an infinitive.[22]

Kehler and Ward (1995)[23] themselves take a different position on the grammaticality of (44), suggesting that it provides evidence that *do so*, while requiring a discourse antecedent, does not require a parallel syntactic constituent to be licensed. Instead, it can be licensed by a non-parallel one. With the exception of examples like (44), which are the topic of debate here, Kehler and Ward (1995) cite the example in (45), where a passive sentence licenses *do so* in its active counterpart:

(45)   As an imperial statute the British North America Act could <u>be amended</u> only by the British Parliament, which *did so* on several occasions [= amended an imperial statute].   (Grolier Encyclopedia)

However, while (45) clearly shows that a mechanical view of parallelism cannot account for the distribution of *do so*, it is not clear that it seriously jeopardizes the claim that *do so* requires a VP/V′ antecedent. Note, specifically, that *do so*, is licensed by a verbal antecedent, which is a constituent containing the verb *amend* and the trace of the direct object *the British North America Act*. That in the first conjunct the direct object

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[22] Note, likewise, that *doing so* is, in all likelihood, a gerund, rather than a derived process nominal, as the ungrammaticality of (i) indicates:

(i)   *The *doing so* was dangerous

In turn, the gerundive nature of *doing so* supports, rather than weakens, our argument. It is usually agreed upon that gerunds contain at least a VP, if not a higher clausal functional structure. What is at stake, however, is not the structure of gerunds, but whether a derived process nominal can license a VP anaphor, as in gerunds or infinitives. The fact that it can thus draws a parallel between the structure of gerunds, which includes VP, and the structure of process nominals, argued here to include a VP as well.

[23]   See also Ward et al. (1991).

is occupied by a trace, rather than a full NP may very well turn out to be immaterial for the licensing of the anaphor *do so*. Note, in general, that adjectives derived from verbs do not license the occurrence of *do so*:

(46)a.   ??This act turned out to be <u>amendable</u>, and the British Parlia-
          ment *did so* in its last session.[24]

  b.   *The fish was edible and Kim did so.

  c.   *Kim tried not to be <u>resentful of her cousins</u>, but her husband
        did so.

In fact, the only cross-categorial example of *do so* licensing provided by Kehler and Ward (1995) is that of process nominals. Unlike them, we suggest that this apparently unique case, exemplified by (44), argues for a VP in process nominals, rather than for a relaxation on the syntactic conditions on the occurrence of *do so*.[25]

Note that material internal to words is generally considered to be an anaphoric island (Lakoff and Ross 1972). If, indeed, *do so* is licensed exclusively by verbal material, in the case of process nominals such verbal material would have to be stem-internal to the derived nominal. This would amount to a special treatment of process nominals in spite of the fact that V^o, in general, does not license the occurrence of *do so* (see (41c)). In contrast, if a VP is present in such nominals, the anaphoric island status of word-internal material can be maintained.

Not only can *do so* take a process nominal as its antecedent, but more importantly it *cannot* take an underived noun or a derived result noun as its antecedent (recall (43), above), even if the latter has an action/event reading. In the examples of (47), the intended antecedents for *doing so* are underived nouns such as *version*, *accident* and *trip*. None are possible. Nor are the result readings of *destruction* and *collection* in (48):

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[24] The slight improvement of the *-able* cases may have to do with whether the verbal meaning is preserved. For those adjectives which have a drifted meaning from the verbal root, *do so* is not possible: *this act is commendable (=/= can be commended) and the judge did so*. See also Roeper and van Hout (1999) for other VP characteristics of *-able*.

[25] Note interestingly that if it is correct to assume that a V' containing a verb and its trace can serve as an antecedent for *do so*, excluding, specifically, the *by*-phrase in (45), it provides an argument against Speas (1990), where it is suggested that no rules of grammar make reference to intermediate projections, and that rules typically assumed to refer to V' in fact refer to a full VP constituent.

(47)a. *His version of the accident and my *doing so* surprised no one.

    b. *His accident before the party and my *doing so* after are not a coincidence.

    c. *Even though a presidential trip is essential, I don't think he will do so.
(compare with the grammaticality of (44b)).

(48)a. *John's complete destruction and my *doing so*

    b. *John's collection and my *doing so*

And most strikingly, especially in view of the claim made by Kehler and Ward (1995) concerning the discourse licensing of *do so*, consider the ungrammaticality of (49), in which an event is referred to, both arguments are provided, but a process nominal derivation is not available:

(49)   *John's self-preservation lasted several weeks, but my doing so lasted only two days.

The ungrammaticality of *self-preservation* as a process nominal can be independently illustrated by applying the diagnostics provided by Grimshaw (1990) in (50), and comparing it with the virtually synonymous (51a–c) cases:[26]

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[26] We set aside here the full explanation of the impossibility of deriving a process reading for compounded forms such as *self-preservation*. Note, however, that this generalizes to all compounds of this nature, e.g., *food-production*, *bridge-construction*, *mushroom-collection*, etc. Two obvious properties of these compounds come to mind. First, note that the non-head nominal within compounds does not have a reference, and thus plausibly cannot serve as a syntactic argument. Second, note that in order to maintain their argumental status within a VP, resulting in a process nominal, nouns such as *food* would have to incorporate into *produce*, and then in turn the compound *food-produce* would incorporate into the nominal affix *-tion*. However, English does not allow noun incorporation into verbs, resulting in a morphological ill-formedness if such movement were to take place. It thus follows that the only way to derive such forms would entail the incorporation of the argument of the verb into the N, across the intervening V head. Assuming such a derivation to be ungrammatical (but note that it requires setting aside Baker's (1988) Government Transparency Corollary), the ungrammaticality of a VP analysis for compounds of this nature follows. On the other hand, as a lexical compounding between two Ns, such forms remain licit, fully accounting for the non-referential nature of the non-head constituent and for the absence of a process reading.

(50)a. *John's self-preservation for hours under pressure was admirable.

　b. *John's constant self-preservation (is getting on my nerves).

　c. *The candidate's self-description in order to gain votes (did not succeed).

(51)a. John's preservation of himself for hours under pressure (was admirable).

　b. John's constant preservation of himself (is getting on my nerves).

　c. The candidate's description of himself in order to gain votes (did not succeed).

Turning to the account of the distribution of *do so* within a semantic-pragmatic approach, it could be proposed, as in Kehler and Ward (1995), that it refers to an event. However, we are now back to the original problem of such accounts: systematically, it turns out that events expressed by nominals distinguish, along numerous dimensions, between those event denoting nominals that are derived from verbs (cf. (42), (44)) and those that are not (cf. (43), (47)). This result is either unexpected or unaccounted for within semantically based approaches.

In summary, the distribution of the anaphor *do so* is identical to that of adverbs: it occurs with VPs and in event nominals derived from verbs, but nowhere else. This generalization is easily captured by the syntactic analysis, but for a semantic account it remains an unexplained coincidence.

2.2. *Do-So vs. Do: Evidence for Absence of TP within Process Nominals*

Consider the following contrast between *do so* and bare *do*, with regard to their nominalizability.

(52)a. The Airforce's destruction of the city with bombs and the Navy's doing so too made the headline.

　b. *The Airforce's destruction of the city with bombs and the Navy's doing too made the headline.

The nongrammaticality of (52b) contrasts with that of (53b):

(53)a.　The Airforce destroyed the city with bombs and the Navy did so too.

　　b.　The Airforce destroyed the city with bombs and the Navy did too.

What is the difference between *do so* and a bare *do*? Déchaine (1993) convincingly argues that while *do so* is a VP constituent, *do* is dominated by the Tense node, outside the VP. These distinct positions for *do* and *do so* are illustrated by their respective positions with respect to negation. While *do so* occurs below negation, bare *do* occurs above it:

(54)a.　He said he would change his socks, but he [$_T$ did] not [$_{VP}$ do so].

　　b.　*He said he would change his socks, but he [$_T$ did$_i$] not [$_{VP}$ t$_i$ so].

　　c.　He said he would change his socks, but he [$_T$ *did*] not [$_{VP}$ t$_i$].

If negation intervenes between Tense and an extended VP, the fact that *do so* occurs below it argues in favor of its position within an extended VP. Similarly, the fact that the bare *do* occurs above negation shows that it is outside our extended VP, plausibly dominated by T.

Given that *do so* is dominated by VP but *do* is dominated by T, the possibility of nominalizing the former, but not the latter, supports our conclusion that the nominalized constituent does not contain T and by extension, does not contain IP. Recall that our conclusion was independently reached on the basis of the distribution of adverbs in process nominals, which allow VP adverbs but exclude IP adverbs. The fact that the distribution of *do* and *do so* in process nominals supports an identical conclusion thus strongly strengthens not only our claim that process nominals do not include an IP, but also our claim that they do include a VP.

3. GRIMSHAW'S 1990 ACCOUNT REVISITED

Let us compare the present syntactic account with Grimshaw's account in light of the distribution of adverbs and *do so*. In Grimshaw's theory there are three types of nominals: complex event nominals (*destruction*), simple event nouns (*trip*) and result nominals (*destructions*). Only complex event

nominals show VP characteristics (theta-marking nouns under her system). Under the current account, only those derived from verbs show VP characteristics. So far we have argued against Grimshaw's account in two ways. First, the distinction between complex event nominals and simple event nominals is semantically unmotivated, and misses the strongest clear correlation associated with event nominals: those which are derived from verbs have VP properties, while those which are not derived from verbs do not have VP properties (or *Ev* properties in the sense of Grimshaw 1990). And this is true regardless of the fact that underived nouns denote an event, and may allow some event modification (e.g., *the trip lasted many hours*). Second, the presence of adverbs in process nominals and the fact that process nominals can function as the antecedents of the VP anaphor *do so* argue for the presence of a real syntactic VP rather than an *Ev* argument. Moreover the positioning of adverbs within process nominals strongly supports a head-raising analysis, which is difficult to accommodate within the type of NP (or DP) structure typically assumed for underived nominals.

We now turn to a third argument against Grimshaw's account. While in most of the cases, Grimshaw's complex event nominals are co-extensive with nouns derived from verbs, there are some nominals derived from verbs which do not give rise to complex event nominals. These nominals, rather than taking arguments, take adjoined modifiers in Grimshaw's system. For example, nouns derived from verbs which take CP complements do not appear to give rise to an event reading by Grimshaw's tests, and she proposes that in these cases, the process nominal takes the CP as an adjoined modifier, rather than an argument. It is for this reason that we get the contrast between (55a), in which a non-CP argument is present and an event reading possible, according to Grimshaw, and (55b), in which a CP is present as an adjoined modifier of the derived noun *announcement* and no event reading is possible.[27]

(55)a.   The announcement of inaccurate results in order to impress the public cannot be condoned.

b.   *The announcement that the results have been inaccurate in order to impress the public should not be condoned.
(slightly modified from Grimshaw (1990))

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[27] R. Higgins (p.c.) observes that (55b) could be improved, as in (i):

(i)   The constant announcement that valuable results will soon be achieved (in order to impress the public) should not be condoned.

Regardless of whether the process nominal in (55b) has an event reading or not, and setting aside the reason for its ungrammaticality (but see fn. # 27), for the account presented here, the event reading of process nominals is an orthogonal matter. What matters is that if the noun is derived from a verb, and if it is not a 'result' noun, it should exhibit VP characteristics. And indeed, the ungrammaticality of (55b) notwithstanding, even tests for process nominals suggested by Grimshaw's arguments group it with process nominals rather than result nominals, as (56) shows. As expected within the system proposed here, *announcement* does license VP adverbs and can function as an antecedent for the VP anaphor *do so* (cf. (57)). And finally note that (58) is not nearly as bad as one would expect if it is a result nominal as Grimshaw claims:

(56)a. The repeated announcement that the results have been falsified should not mislead you.

b. The demonstration that the defendant was guilty for five hours exhausted the jury.

(57)a. The candidate's announcement so quickly that results have been falsified raised doubt on his credibility.

b. The president's announcement that he is not running for reelection was surprising. But three other senators' doing so was astonishing.

c. The president's announcement repeatedly that he is not running for reelection alarmed his own party. Fortunately, no senator of his party is expected to do so.

(58)   The announcement repeatedly that OJ Simpson must be innocent just to impress the media, should not be condoned by the court.

None of these characteristics of *announcement/demonstration* are expected under Grimshaw's analysis. On the other hand, in a system that draws the division not along semantic lines, but along the presence vs. absence of a structural VP, these results are expected.

4. CONCLUSION

Our examination of subtle English data has revealed that there exists empirical evidence in favor of a VP within nominalizations. We have shown that it is precisely the VP (and its argumental projections), not IP or CP, which is present. And we have shown that an array of word order and interpretive facts about nominalizations fall into place when we assume that the verb is raised to a nominal marker over the subject, object, and adverb.

Our analysis makes predictions that go beyond the scope of this paper. It should be the case, if a VP is present, that the syntactic constraints typical for VP-level operations apply. We should expect to see thematic, case, and Event-related constraints appearing within nominalizations. Precisely these consequences correlate with the presence of events, the presence of passives, and the exclusion of middles (see van Hout and Roeper (1999) and Roeper and van Hout (1999) for extensive evidence that these predicted consequences occur). Their existence makes the syntactic verbal structure within derivational morphology unavoidable.

We have not addressed the specific semantic and aspectual character of nominal affixes, or a number of nominal features. We believe that the syntactic skeleton we advocate will lead to insight into these questions as well.

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