

The morphology of nominalizations and the syntax of *vP*

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1 Introduction

In a 'pervasive syntax' approach to morphologically complex forms, like that of Distributed Morphology, the analysis and structures proposed for a form must also be contained within the analysis of any structure derived from that form. That is, in the same way that the structural analysis for *Mary left* is contained within the structural analysis for *John said that Mary left*, the structure for *marginalize* must be contained within the structure for *marginalization*.

When morphological structure and semantic composition coincides, as in this example, this is hardly controversial, but in cases where the structure coincide but the semantics diverge, as in *transmit* and the car part *transmission*, or as in *organize* and *organization* (a company) the usual approach has been to propose reanalysis and an opaque internal structure in the divergent derived form. In syntactic structures that have both idiomatic and compositional interpretations, however, the meaning drift in the idiomatic interpretation has usually not been taken to indicate any fundamental alteration of the syntactic structure associated with the string. *Play with a full deck* participates in the morphosyntactic structure like a verb phrase, even when its interpretation is not compositional, and it seems clear that chunks of structure larger than a single syntactic terminal node are able to associate with particular meanings. When the same point is applied to complex morphological structures, the moral is the same: the structure required by the

morphemes must be present even when the meaning of the whole is not compositional.

Reanalysis is not necessary to explain these idiomatized interpretations.

For English nominalizations, however, certain types of meaning shift, from event to result readings, seem to be quite productive and predictable, and hence hardly idiomatic. These meaning shifts do *not* affect the internal morphological structure of the nominalization, which entails that in a DM approach, the complete complex structure must be present. This challenge to a DM approach to English nominalizations was first laid out in detail in Borer 2003, as well as in Alexiadou (this volume) and Ackema and Neeleman (2004), and is taken up here. This paper explores first what that internal structure must consist of, by considering the syntax of verb-particle constructions and their behavior in mixed nominalizations, then identifies particular verbal morphemes with particular syntactic terminals. This points to certain conclusions about the structure of the verb phrase, and the meaning contributions of certain subcomponents. Finally some speculation is presented about the problem of how to derive the result nominalization meaning, given the necessary conclusion, for DM, that they have verbal syntactic structure contained within them.

The central point is that taking the morphology-syntax relationship seriously strongly constrains what you can propose in terms of a structural representation of nominalizations

1.1 DM background

As noted above, Distributed Morphology proposes to adopt a syntax-based approach to word structure. There are three foundational claims that are relevant to the current discussion:

- (1) a. DM is *piece-based*: Morphemes are independent entities that occupy terminal nodes of a hierarchical structure built by the syntax with normal syntactic processes
- b. DM is *realizational*: The syntactic terminal nodes are fully specified for featural (and semantic) content. Each terminal node receives a pronunciation after the syntax is finished. The terminal nodes are thus *realized* post syntactically by morphemes (called 'Vocabulary Items').¹
- c. Vocabulary Items may be underspecified for feature content, and compete for insertion into a terminal node via the Elsewhere Principle. Hence a single VI could win competitions for nodes with quite different syntactic (and semantic) specifications.

The key point, for present purposes, is that wherever you see a morpheme, there must be a corresponding a terminal node in the structural analysis of the sentence.² Where you *don't* see a morpheme, there may well be a terminal node filled by a \emptyset element; this happens all the time in English. But where you *do* see a morpheme, there had better be a terminal node.

There are only two broad classes of terminal nodes in DM: roots ($\sqrt{\text{ }}$ s, what Harley & Noyer 2000 call *l-morphemes*) and grammatical elements of various kinds (*f-morphemes*). Roots are a-categorial, acquiring a category by virtue of the f-morphemes they are Merged with in the

¹ Here I'll often use 'morpheme' to refer to individual Vocabulary Items, like *-ed*, *-ation*, *cat*, rather than to the abstract terminal node into which VIs are inserted, although technically DM terminological convention has generally reserved 'morpheme' to refer to the latter (as in 'dissociated morpheme', and VI to the former).

² The terminal node may be originally syntactic (i.e. have originated as part of the Numeration and been added to the structure via syntactic Merge), or inserted as a 'dissociated' morpheme/terminal node at Morphology, prior to vocabulary insertion (see, e.g. Embick 2000). All the morphemes of concern here, however, seem to have a syntactic origin (though see fn. 8 concerning Last Resort *of*-insertion).

syntax. The category-creating f-morphemes are usually labeled with the lower-case version of the lexical category they correspond to: a verbalizer is a v° , a nominalizer is an n° , an adjectivalizer is an a° .

2 Some possibilities in the syntactic analyses of process-nominals

To begin, let us consider the relatively recent proposal of Kratzer 1994, 1996 concerning the derivation of *-ing* nominals in English. There are several classes of such nominals, first characterized comprehensively by Lees 1960. Here, we will consider only the contrast between the broadly verbal *-ing* forms, the 'ACC-ing' class, and the broadly nominal *-ing* forms, the 'OF-ing' class.

- (2) a. ACC-ing nominalizations (Lees 1960)
 Belushi('s)³ foolishly mixing drugs and alcohol was the cause of his death.
 b. OF-ing nominalizations
 Belushi's foolish mixing of drugs and alcohol was the cause of his death

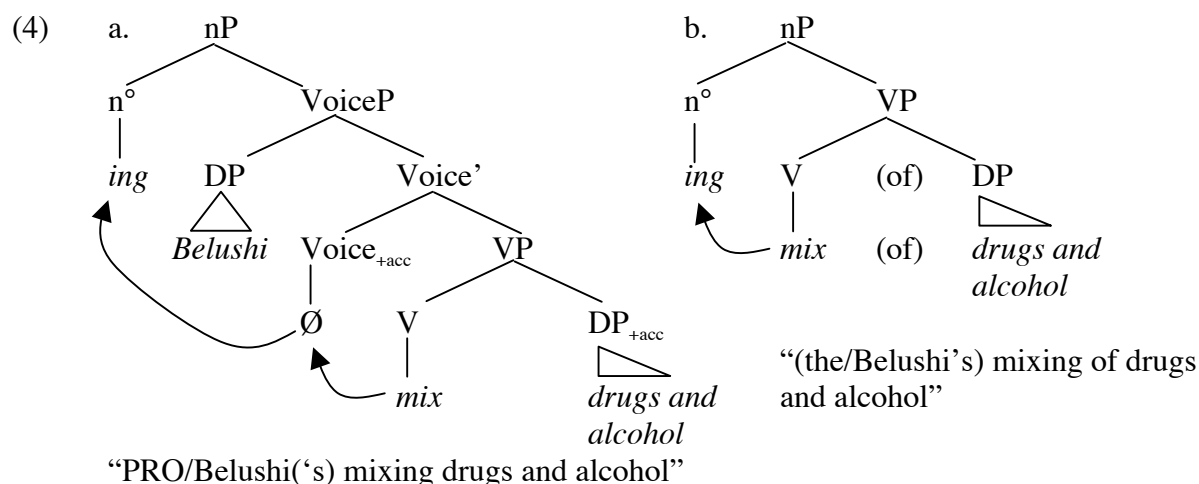
³ I've grouped 'ACC-ing' and 'POSS-ing' gerunds together here, because they both license accusative and admit adverbial modification, which are the main properties we're interested in. However, Siegel 1998 has shown that they differ in an interesting way with respect to their event reference (and both differ from regular *of*-nominalizations as well as the 'mixed' nominalizations. *of*-nominalizations fit in achievement-entailing sentences, accomplishment-entailing sentences, and activity-entailing sentences. POSS-ing gerunds don't fit in any temporal-content entailing sentences. ACC-ing sentences (like PRO-ing sentences) fit in accomplishment-entailing frames. She concludes that accusative-assigning gerunds are progressive AspPs (which would solve the problem raised below in fn 5, but entails that there are two different *-ing* suffixes)

- (i) Belushi's mixing of drugs and alcohol takes place here.
 *Belushi's mixing drugs and alcohol takes place here
 *Belushi/PRO mixing drugs and alcohol takes place here.
- (ii) Belushi's mixing of drugs and alcohol took place at 3:07 precisely.
 *Belushi's mixing drugs and alcohol took place at 3:07 precisely.
 *Belushi mixing drugs and alcohol took place at 3:07 precisely.
- (iii) Belushi's mixing of drugs and alcohol takes an hour.
 *Belushi's mixing drugs and alcohol takes an hour.
 Belushi mixing drugs and alcohol takes an hour.

- (3) ACC-ing properties:
 Verbal characteristics:
 accusative case assignment, adverbial modification
OF-ing properties:
 Nominal characteristics
 of-case assignment, adjectival modification

Kratzer proposed an analysis according to which the difference between the two types had to do with whether the *-ing* suffix is attached above or below a subject-introducing projection that she termed 'VoiceP, a 'high/low attachment' analysis that is essentially a modernized interpretation of Abney's (1987) analysis.⁴ If *-ing* attaches outside the VoiceP, the result is the ACC-ing type; if *-ing* attaches to the VP without a VoiceP, the result is an OF-ing structure. The assumptions underlying this approach are that accusative case, as well as the subject theta-role, is associated with the Voice head—thus deriving Burzio's generalization. The necessity of Last-Resort *of*-insertion in the OF-ing cases, then, results from the absence of the VoiceP, and hence the absence of accusative case in the structure.

⁴ Alexiadou (this volume) presents a similar type of syntactically-based analysis for Greek deverbal nominals, where the different positions correlate with differences in the nominalizing morphology.



(In the structure in (4)a, the external argument must be case-marked by some higher projection, possibly GerP. In (4)b any ‘external argument’ is a simple possessor, introduced in Spec-DP in the normal way.

At the time, it was then immediately natural to associate Kratzer's external-argument-introducing VoiceP with Hale and Keyser's agent-introducing outer VP shell, or Chomsky's agent-introducing vP shell. Distributed Morphologists (Harley 1995, Marantz 1997) also identified the verbalizing v° head with the external-argument introducing vP shell, so that in Kratzer's structures in (4), the lower VP head could not appropriately be termed a VP anymore—the head projecting it would be an acategorical root, rather than a proper verb. It would only be after the lower $\sqrt{\text{ }}$ affixed itself to the upper v° via head-movement that the resultant complex head could be called a 'verb.'

This latter conflation of Voice $^\circ$ with the verbalizer v° seemed to offer some promising leverage on the verbal vs. nominal properties of the two types of gerund. If VoiceP is the same as DM's verbalizing vP, then its presence in (4)a accounts for the verbal categorical properties of ACC-ing gerunds, especially their ability to take adverbial modification, include auxiliary

sequences, and so on⁵—the verbal characteristics of these gerunds would follow because there is a genuine verb in the structure, created by the presence of the Voice^o/v^o head. The absence of this head in (4)b, on the other hand, accounts for the emphatically nominal characteristics of OF_{ing} nominalizations—allowing adjectival modification, not permitting auxiliaries, permitting determiners, and so on. The absence of Voice^o/v^o would entail that at no level would the structure ever be fully verbal.

Harley and Noyer (1998) proposed to extend Kratzer's approach to account for another syntactic difference between OF-ing and ACC-ing structures. ACC-ing structures continue to exhibit fully verbal behavior when they are formed from verb-particle complex predicates, namely, they continue to allow particle shift. OF-ing structures, on the other hand, do not permit particle shift. This is illustrated in (5) below: (5)a-b show the basic particle-shift phenomenon; (5)c-d show that particle shift is possible in ACC-ing gerunds, and (5)e-f show that particle shift is degraded in OF-ing nominalizations, as first noted in Chomsky 1970.

⁵ There is another problem with this approach, however: If -ing in 2a is same n^o -ing as in 2b, the analysis doesn't obviously help with the unavailability of determiners and adjectival modification—if it's the same nominalizing -ing, then one might expect that from the outside, the ACC_{ing} gerunds should look like regular nPs. See fn 3 above. It is possible that the properties of -ing differ when it is adjoined within the I-syntactic domain and outside of it; a similar conclusion is reached by Gueron (in prep) with regard to have. We leave this problem for future work.

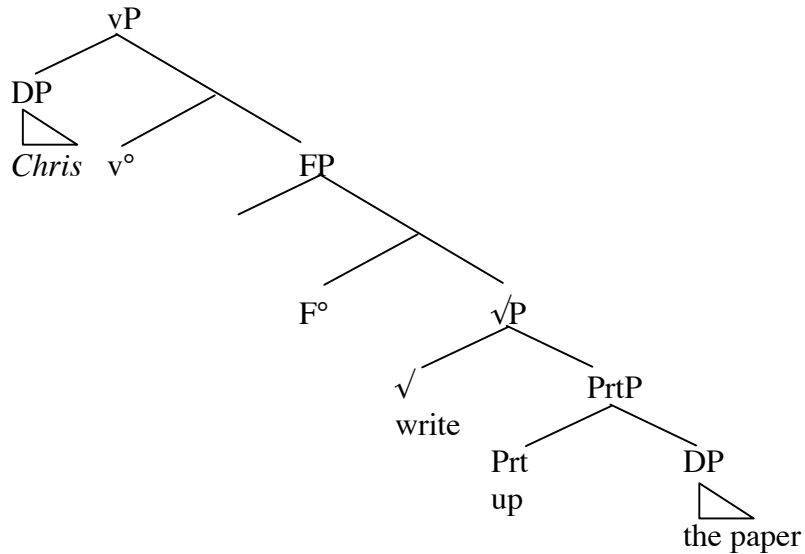
- (5)
- a. Chris **wrote** the paper **up**.
 - b. Chris **wrote up** the paper.
 - c. Chris writing the paper up so quickly surprised Pat.
 - d. Chris writing up the paper so quickly surprised Pat.
 - e. *Chris's **writing** of the paper **up**.
 - f. Chris's **writing up** of the paper.

Harley and Noyer 1998, following the proposals of Johnson 1991 and Koizumi 1993, proposed an analysis of particle shift based on two key factors: a) short object movement to a case-checking position internal to vP, and b) optional incorporation of the particle into its selecting verb.⁶ That analysis is presented in (6)-(8) below. The particle + object form a ParticlePhrase constituent — a small clause that provides a result state for the verbal action, much along the lines proposed by Ramchand and Svenonius (2002). The FP is a case-checking position (AgrO in the original analysis) to which all accusative objects in English must move.⁷

⁶ Den Dikken 1995 argues that the particle must head its own projection since the particle may be modified like a regular PP, by adverbials like *right* or *straight*: *He wrote the paper right up*. This modification is only possible in the V-O-P order, however; when the particle is adjacent to the verb, it is impossible: **He wrote right up the paper*. On the analysis proposed by Harley and Noyer, this follows because on the V-P-O order, the V-P sequence is a complex head, leaving the modifiable PrtP behind containing a trace.

⁷ Koizumi exploits the presence of a purely morphosyntactic projection like AgrO to account for a well-known but problematic generalization about English syntax: Stowell 1981's Adjacency Condition. Adverbial material may not intervene between an English verb and its accusative object **Chris kissed quickly Pat*, although it may do so when its argument is a PP: *Chris spoke quickly to Pat*. If all accusative objects appear in Spec-AgrOP, selected for by v°, and if adverbs may only adjoin to semantically contentful projections, then the impossibility of adjoining an

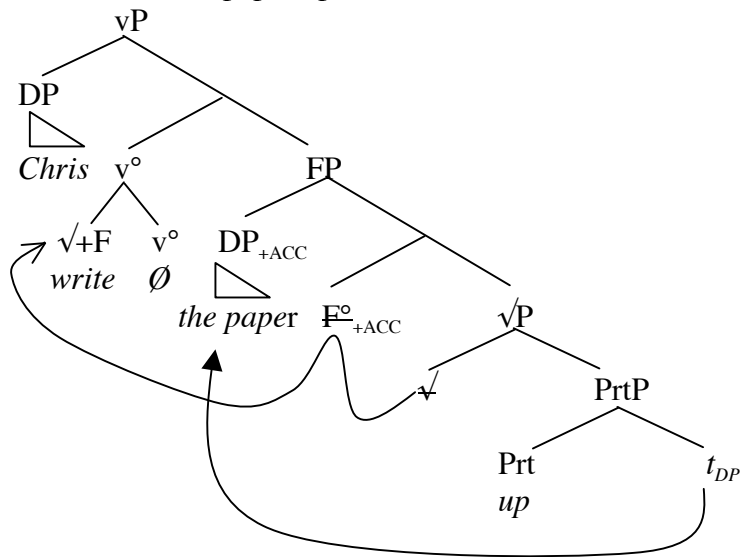
(6) Structure without any movement:



Following head movement of the verb root through F° to v° and movement of the object DP to spec-FP to check its accusative case, the order of terminal nodes will give *Chris wrote the paper up*.

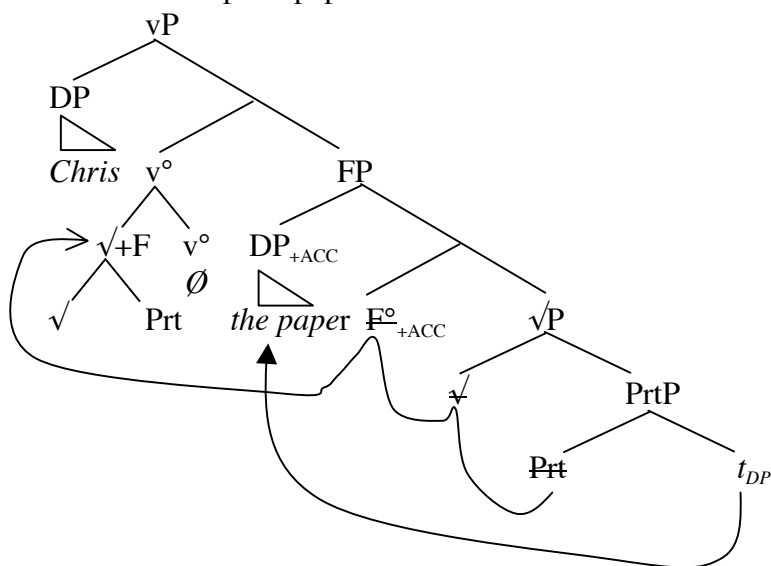
adverb to semantics-less AgrOP explains why adverbs may not intervene between the verb in v° and the accusative object in Spec-AgrOP.

- (7) Chris wrote the paper up.

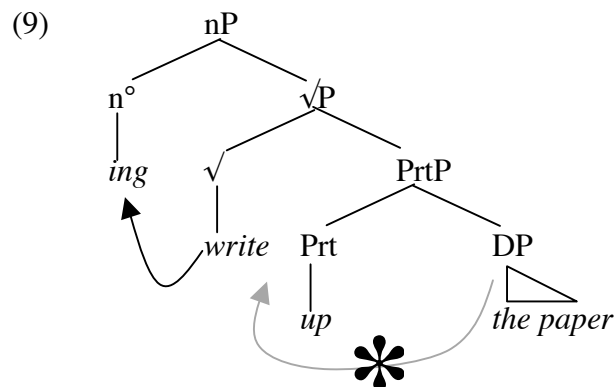


Assuming that the result-specifying particle may optionally head-move to incorporate into its selecting $\sqrt{}$, and will then subsequently be carried along by head-movement of the $\sqrt{}$ to v° , we can then provide the following structure for the shifted V-P-O order:

- (8) Chris wrote up the paper.



Having established an account of particle shift, let us now turn to the explanation for its failure in OF-*ing* gerunds that Kratzer's approach provides. Let us assume that v° selects for FP. If v° is not present, then FP is not present, and hence accusative case is not present. Applying Kratzer's nominalization proposal to these structures, then, explains why ACC-*ing* allows particle shift, and why OF-*ing* doesn't. In the former case, vP and FP are present in the structure. Hence $\sqrt{\text{to-v}^\circ}$ movement & DP movement to Spec-FP will occur, and, combined with optional Prt incorporation, particle shift can be generated. In the latter case, on Kratzer's proposal vP is absent. Hence FP is also absent. Hence, no $\sqrt{\text{to-v}^\circ}$ or short object movement to Spec-FP are possible: in OF-*ing* nominalizations, the base-generated order is the only possible one. This is illustrated in (9)



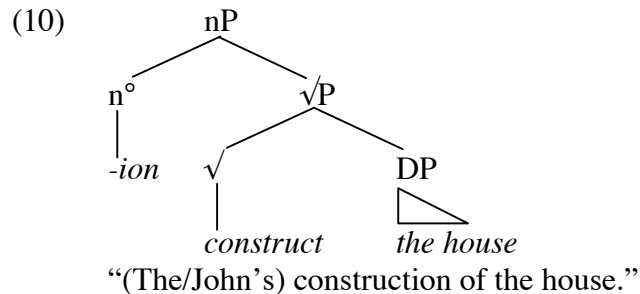
“(The/John’s) writing up of the paper”

“*(The/John’s) writing of the paper up”

Various kinds of object-licensing projections have been proposed between vP and the lexical verb part of the structure: FP could be equivalent to AgrO, or to AspP, or Ramchand's ProcP, or Borer's AspQP (though see note 7). Further, FP has to be absent in the nominalized form for the

analysis to work — that is, *of* can not be the realization of the F° head in a nominal context, as for Fu, Roeper & Borer (2001)⁸.

Harley and Noyer assume the same structure for regular event nominalizations, which also have an *of*-licensed object DP:



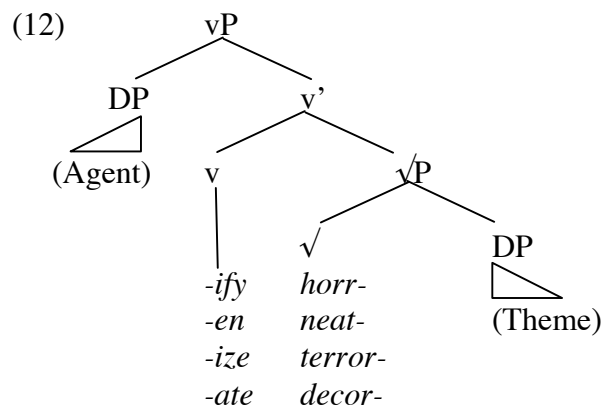
3 English verbalizing morphemes

So, taking seriously the notion that v° is the verbalizing head, there are some obvious candidates for overt v° morphemes in English. Among others, there are the verbalizing affixes *-ify*, *-en*, *-ize*, and *-ate*. These can combine with roots or stems to form verbs, most obviously verbs with a causative reading, as illustrated in (11):

⁸ Note that FRB’s proposal makes the wrong prediction with respect to ECM in OF-ing nominalizations, namely that it should be possible. The point of Chomsky’s classical inherent case treatment of *of* is that it’s not: **John’s belief of Mary to be innocent*. I assume here that *of*-insertion takes place into a ‘dissociated morpheme’—a terminal node inserted post-syntactically to ensure morphological well-formedness in certain conditions. (For a discussion of the Raising-to-Object approach to ECM necessitated by the system adopted here, see Lasnik 1999.)

- (11) Causative meanings
- a. horrify, gratify, justify, certify, specify, vilify, simplify, passify, objectify
 - b. deafen, dishearten, dampen, sadden, neat-en, coarsen,
 - d. categorize, terrorize, alphabetize, categorize, customize, digitize, idolize
 - e. complicate, calculate, commemorate, pollinate, decorate, regulate, disambiguate

Given that we have taken v° above to be equivalent to Kratzer's external-argument-introducing Voice head, or to Hale and Keyser's agent-introducing V head, this seems like the right kind of meaning for a verbalizer to have. It will introduce the external argument and assign it an Agent or Causer interpretation, and take some sort of result-state-denoting \sqrt{P} complement:



However, these verbalizers aren't restricted to causative-only environments, as pointed out by Sawai 1997. They all may occur on inchoative/causative alternating verbs; on the inchoative use, of course, these have no Agent argument:

- (13) Inchoative/causative alternators
- a. coagulate, activate, detonate, dilate, oscillate, correlate, levitate, separate
 - b. gentrify, emulsify, clarify, unify, petrify, solidify
 - c. awaken, broaden, whiten, deaden, darken, flatten, freshen, lighten, loosen, ripen
 - d. crystallize, caramelize, concretize, capsiz-e, depressurize, fossilize, ionize, stabilize

Furthermore, *-ate*, *-ify*, and *-ize* (but not *-en*) all occur on a few purely unaccusative verbs, with no causative alternant:

- (14) Unaccusatives
- a. capitulate, deteriorate, gravitate, stagnate,
 - b. qualify, stratify, putrefy
 - c. acclimatize, metastasize, naturalize, specialize

Finally, *-ate*, *-ify*, and *-ize* (but not *-en*) all occur on unergative activity verbs as well (contra Sawai 1997):

- (15) Unergatives
- a. dissertate, elaborate, ejaculate, commentate, hesitate, undulate, lactate, vibrate
 - b. testify, speechify
 - c. cognize, concertize, fraternize, fantasize, harmonize, temporize, sympathize

Nonetheless, they are all verbalizers, so in DM they should all be instances of v° . Harley 1995 and Marantz 1997 recognize the need for a v° head to be present in unaccusative verbal structures as well; this v° head would have a different semantics than the external-argument introducing verbalizer—something closer to 'become' than 'cause'. There must therefore be different varieties, or 'flavors,' of v° , all serving the verbalizing function, but expressing distinct meanings to do with the initiation or lack thereof of the verbal event. Harley 1999, 2005 and Folli and Harley 2004 further characterize a stative v° , v_{BE} , and an agentive (rather than causative) activity-denoting v° , v_{DO} . The v° , then, is the locus of the eventive vs. stative distinction in verb types, as well as the distinction between caused or spontaneous events, and the distinction between activity events and change-of-state events. Assuming these distinctions in v° can be characterized in terms of feature clusters such as $[\pm dynamic]$, $[\pm change.of.state]$, $[\pm cause]$, then

we could capture the distribution of the verbalizing affixes via underspecification in the usual DM fashion.⁹ In (16), the feature specification defining each 'flavor' of v° is given:

- (16) a. v_{CAUS} : [+dynamic], [+change of state], [+cause]
 b. v_{BECOME} : [+dynamic], [+change of state], [-cause]
 c. v_{DO} : [+dynamic], [-change of state], [-cause]
 d. v_{BE} : [-dynamic], [-change of state], [-cause]

In (17), the Vocabulary Items for the four verbalizers described above are given. Their underspecification for $[\pm\text{cause}]$ ensures that they will be able to realize v° in its v_{BECOME} flavor as well as its v_{CAUS} flavor; further, the underspecification of *-ify*, *-ize* and *-ate* for $[\pm\text{change of state}]$ ensures that they will be able to realize v° in its v_{DO} flavor as well, and hence predict the range of event types possible with each suffix. Each suffix necessarily also comes with a list of stems to which it can attach, as well, since in no case is any of these suffixes a completely productive 'Elsewhere' verbalizer. In English, the Elsewhere v° Vocabulary Item is \emptyset .

⁹ Since these features are in an implicational relationship, it might be that they are organized

geometrically:

	Eventuality	
	Dynamic	Stative
Change of State	Activity	
Externally Caused	Spontaneous	

- (17) a. $-en^{10} \leftrightarrow [_{v^o} [+dynamic], [+change\ of\ state]] / [_{A} \{flat, dead, white...\}]$ _____
 b. $-ify \leftrightarrow [_{v^o} [+dynamic]] / [_{\sqrt{v}} \{hor-, clar-, glor-...\}]$ _____
 c. $-ize \leftrightarrow [_{v^o} [+dynamic]] / [_{\sqrt{v}} \{categor-, terror-, alphabet-...\}]$ _____
 d. $-ate \leftrightarrow [_{v^o} [+dynamic]] / [_{\sqrt{v}} \{complic-, decor-, regul-...\}]$ _____

This is all very well, but it leads to a serious and obvious conflict for the OF-nominal analyses above, which is what we turn to next.

4 The morphology of [[[nomin]_val]_Aiz]_vation]_N

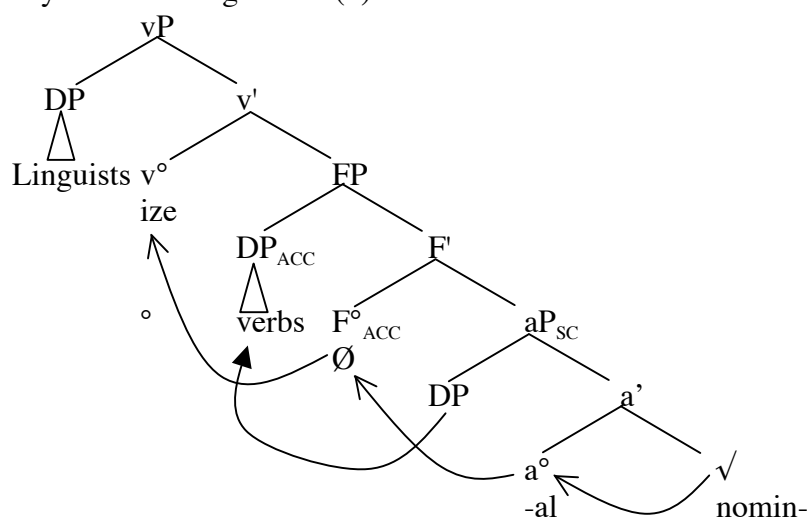
The problem is that all these verbal suffixes occur perfectly happily inside nominalizing affixes, to create deverbal nouns that then require *of*-insertion to license their objects. This is essentially the problem of inheritance noted by, Ackema and Neeleman 2004:Ch.2, and discussed extensively by Borer 2003 and Alexiadou (this volume). If the syntax *is* the morphology, and the morphology of the verb is present, where are the verb's syntactic properties? Why, for instance, can't the nominal *nominalization* license accusative case on its

¹⁰ In fact, this analysis does not predict that *-en* cannot occur on purely unaccusative stems—the [+change of state] feature specification does not require that a given verb alternate with a causative form, but just that it involve a change of state, as most or all purely unaccusative verbs do. There are two possible approaches to the apparent absence of strictly unaccusative *-en* verbs: a) it's an accidental gap, fillable in theory by some new verbal concept (perhaps *smarten (up)*, as used in my father's English, is such a form) or b) there is some characteristic of purely unaccusative verbs that is not captured by the present feature inventory, perhaps \pm durative—many purely unaccusative verbs (*arrive, die*) are achievements, not accomplishments. If that were the case, then *-en* could be specified for +durative environments only, and hence be excluded from purely unaccusative verbs.

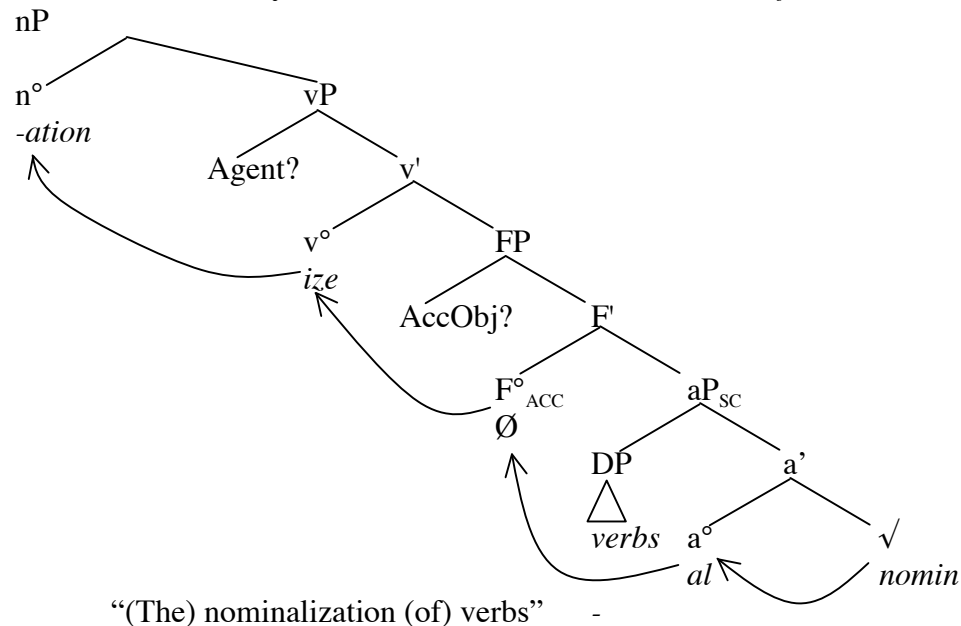
internal argument? Recall that above, we assume that *-ize* realizes a v° , which (when agentive) may select for an accusative-licensing FP. Further, in the analysis of OF-ing gerunds above, it's the absence of a verbalizing v° that accounts for the need for adjectival rather than adverbial modification, and the possibility of a determiner or pluralization, in OF-ing nominals as well as other derived nominals like *destruction*. Yet it's perfectly clear that these derived nominals can contain verbalizing v° that accounts for the need for adjectival rather than adverbial modification, and the possibility of a determiner or pluralization, in OF-ing nominals as well as other derived nominals like *destruction*. Yet it's perfectly clear that these derived nominals can contain verbalizing morphemes like *-ize*.

Given our discussion of categorizing morphemes above, the structure of the verb phrase *to nominalize verbs* and its nominalization *(the) nominalization of verbs* would be as illustrated in (18) and 0 below:

- (18) Internal structure of the vP (*to nominalize verbs*), as in *Linguists often nominalize verbs*, on analysis of the vP given in (6) above:



Given (18), the structure necessarily contained within *the nominalization of verbs*



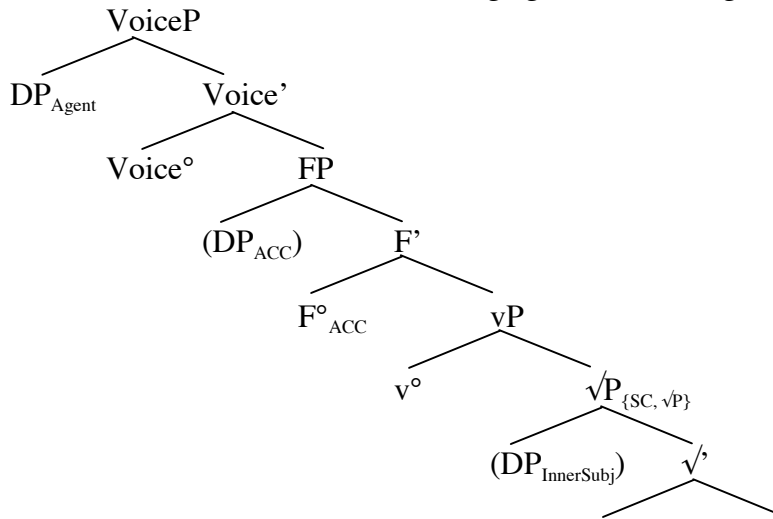
To recap: If the verbalizing v° morpheme is there, then the nominalizer must be attaching to the vP. If the nominalizer is attaching to the vP, then the external argument and accusative case should be available. They’re not available.¹¹

¹¹ Fu, Roeper and Borer, as noted in fn. 8, in fact do assert that the external argument and accusative case are available in nominalizations. See fn 8 for the reason I do not assume that accusative case is available; I also follow Chomsky 1970 (as interpreted in Marantz 1997) in assuming that true verbal external arguments are not available in nominalizations, but rather that certain kinds of agency are licensors of the possessive 'nexus'. If the verbal external-argument-introducer were present in nominalizations, the impossibility of *#John's growth of tomatoes*, or Causer external arguments like *#Adultery's separation of Jim and Tammy Faye Bakker* would be mysterious. If Agents, but not Causers ('Stimuli') can license the possessive nexus, however, the discrepancy in types of possible external arguments between verbs and their nominalizations can be accounted for.

The inevitable conclusion,¹² then, is that the verbalizer v° is not the external-argument-introducing head. Further, the verbalizer v° does not select for the Case-checking head—rather, the external-argument introducing head does. The Agent head and the Case head must occur outside the verbalizing v° head, and hence be excludeable from nominalizations. The Agent+Case-head complex, then, takes the verbalizing v° head as its complement—in other words, the complement of VoiceP really is vP (VP!), not an acategorial root. The v° is really the lower V head in the split-VP structure; its complement is the SC or event-or-entity-denoting thing which determines the extent of the event via a homomorphism, in the terms of Harley 2005 and Folli and Harley 2006. I assume the v° head is equivalent to the ProcP head of Ramchand (1999).

¹² I have argued against the presence of an intermediate verbal head in past work (Harley 1995, 2005, e.g.), and I still feel there are significant puzzles associated with the presence of this intermediate verbalizer. Why, for instance, can it not introduce the external argument, or *some* argument, on its own? Why is there not a distinguishable scope for *again*-type adverbials at this level? Why is there so little morphological attestation of the distinct Voice vs. v° heads cross-linguistically? One doesn't see both v_{CAUS} and Voice $^\circ$ independently and simultaneously realized in the morphology of verbs, though see Pytkkanen 2002 and Travis in prep.

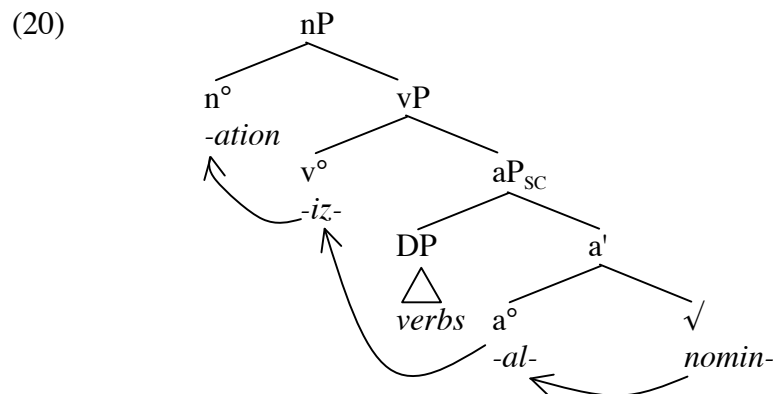
(19) Full verbal structure thus far including agent-introducing head¹³



¹³ I shudder to confess it, but an apparent difference between OF-*ing* nominalizations and irregular event nominals in -*tion* and similar affixes may motivate a reorganization of the structure in (19) and yet more structure on top of that. The judgments are unclear, but it seems that OF-*ing* nominals may allow any kind of agent argument—*John's growing of tomatoes*, *Adultery's separating of Jim and Tammy Faye*. (These NPs improve to perfection in the ACC-*ing* form, but are noticeably better than *growth* and *separation*, to my ear.) Assuming this is not just a garden-path effect, we are faced with a situation where true external arguments are licensed, but not accusative case, nor auxiliary stacking. A structural account of the putative three-way contrast between OF-*tion*, OF-*ing*, and ACC-*ing*, then, could go like this: the accusative-case-checking FP appears outside VoiceP (Chomsky 1993's original placement of AgrO), and OF-*ing* nominals are formed on a VoiceP with no FP above it, thus explaining the availability of true external arguments but the absence of accusative case. In the verbal domain, the placement of the verb to the left of accusative objects, then, would mean that verbs move even higher than FP (which is now above VoiceP)—to an Auxiliary or Aspect head. The true ACC-*ing* gerunds, then, would be formed on this uppermost head.

\sqrt{o} (DP_{Goal})

The structure of *nominalization of verbs*, then, is pretty much what any morphologist would tell you it was. It excludes the VoiceP and FP:



5 Process vs. Result Nominals

We now have a syntactic analysis of nominalizations which can account for the presence of verbalizing morphology but the absence of other syntactic properties associated with the verb phrase. However, we have not yet addressed one crucial aspect of the nominalization equation, namely, the question of whether nominalizations have the verbal *semantics* that above we have associated with the vP (not with VoiceP, and certainly not with FP). This is the crucial problem addressed by Borer 2003 in her discussion of this issue, and the central issue is the process vs. result nominal distinction discovered by Grimshaw (1990).

The central results of Grimshaw (1990)'s typology of deverbal nouns are summarized in (21) below:

(21) Process nominals:

→ take arguments

- a. The assignment **of difficult problems** (bothers the students.)
- a'. The transformation/#change of the caterpillar (was complete).
(but: The change of scene was just what she needed
The push of a button will open the pod bay doors)

→ accept aspectual modification, and modifiers like 'frequent' and 'constant' in the singular¹⁴

- b. The frequent assignment of difficult problems (bothers the students).
- b'. #The frequent blast (bothered the students).
- c. Their performance of the play in only two hours (surprised the critics).
- c'. #Their dance in only two hours (surprised the critics).
- d. Transformation of the caterpillar into a butterfly as rapidly as possible is essential for the survival of the insect.
- d'. #The caterpillar's change into a butterfly as rapidly as possible is essential for the survival of the insect.

→ don't allow plurals? or (count) indefinite forms?

- e. The migrations of large populations (have devastated the area).
- e'. #A complete creolization of a pidgin can often occur in a single generation
(OK: A change of scene was just what she needed.
A push of the button will open the pod bay doors.)

¹⁴ Fu, Roeper & Borer 2001 argue that process nominals allow adverbial modification (even though they're *nominals*) and *do-so* replacement, at least contrastively with non-deverbal event nominals. The judgments are rather iffy (see, e.g., the discussion in Ackema and Neeleman 2004:21-23); here are the best examples I can come up with:

- (i) a. The treatment of the symptoms regularly is important for a good prognosis.
b. #The therapy for the symptoms regularly is important for a good prognosis.
- (ii) a. John's removal of the garbage in the morning and Sam's doing so in the afternoon kept the apartment smelling fresh.
b. #Bill's revenge on Joe in the morning didn't take long, but Sam's doing so in the afternoon occupied three or four hours.

The conclusion drawn from all the above is that deverbal process nominals are mass nouns¹⁵ So far, so good.

The crucial problem when these nominals occur without their internal arguments. In this situation they get what Grimshaw termed a ‘result’ interpretation. They become count nouns, and stop allowing aspectual modification and *frequent*, *constant*, etc. In other words, process nominals *have* to take their internal argument, just like their corresponding verbs; when the structure associated with the internal argument goes away, they lose their process reading and acquire a different, ‘result’ semantics.

- (22)
- a. #The frequent assignment bothers the students.
 - b. #The performance in an hour surprised the critics.
 - c. #The creolization in a single generation surprised the linguist.

How can we treat these result interpretations, and their sudden absence of obvious event structure, within the syntacticocentric set of DM assumptions? Borer (2003), working in a very similar framework, concludes that both syntactic and ‘morphological’ word-formation is possible with these suffixes. Syntactic word-formation results in an event nominal with internal syntactic

¹⁵ Allowing ‘frequent’ without plural is a fact about mass event-denoting nouns, not just a fact about deverbal process nominals:

- (i)
- a. Frequent arson left the town a blackened shadow of its former self.
 - b. *The arson (of the church) in a blazing half-hour on Saturday night...
 - c. Frequent dance was the reason Maria was in such good shape.
 - d. *The dance of the Irish jig in two minutes put Sean in first place.

structure, a position for the object, etc.; pre-syntactic word-formation produces a syntactically atomic N° which has the interpretation of a result nominal. This type of approach is not possible within DM; to adopt the notion that words can be built either pre- or post-syntactically would make most of the framework's strongest predictions and claims vacuous. Because these result nominals retain their full morphological structure, a DM account has to accept that they are fully as internally complex as their event nominal counterparts.¹⁶ The complex morphology *also* tells us that even on the result reading, these nominals must contain all that they need to denote complex events—the v° and its complements (minus any arguments). We are forced to the position that some other factor must be interfering with the internal-argument licensing ability here.

In fact, we know that coercion from a mass to a count interpretation is independently possible in English (*two coffees, that wine, many rains*)—and that different kinds of mass nouns result in different kinds of count interpretations (*two cups of coffee, that kind of wine, many seasons of rain*). Mass process nominals, when coerced to count nominals (perhaps by a higher, null, 'packaging' head such as Num or Cl), tend to give a result interpretation. The idea that I wish to suggest here is that in undergoing the coercion from a mass, process-denoting nominal to a count, result-denoting nominal, a semantic side-effect kicks in which rules out the presence of the syntactic object.

In the structure for the vP proposed above, the object (or resultative small clause containing the object) measures-out the duration of the event denoted by the vP, via a Krifka-

¹⁶ (Note that some languages *do* show major morphological diffs between event and result nominals, see e.g. Englehardt (2000) on Hebrew.)

style Event-Object (or Event-Path) homomorphism. The semantic role of the object in the structure, then, is to provide a boundary for the unfolding of the event.

The role of the count-noun-creating head in coercion of mass nouns to count interpretations (the 'Packager', in Jackendoff's 1991's terms), is similar. The packaging head imposes a boundary on the mass noun, making it discrete and countable—quantizing it, in Borer 2005's terms. I wish to suggest that the presence of a syntactic object is incompatible with the coercion of a process nominal to a count noun because the delimitation imposed by the packager is incompatible with the delimitation imposed by the object. In *the nominalization of the two verbs*, the extent of the verbs (two of them) determines the extent of the nominalization event. It goes on until both verbs have been nominalized. When the noun is coerced to a count reading, (*a nominalization (#of two verbs)*), the packager specifies the boundaries of the new meaning, and the object may not play its delimiting role. Hence, if the object is present in the structure, the conflicting interpretations imposed by the two delimiters results in ill-formedness.

It is worth noting that this effect is not confined to verbs with overt nominalizing morphology. Below are presented some simplex (\emptyset -derived) mass event Ns which take an argument and which in my judgment accept modification with 'frequent'. I've included for each a 'frequent'-modified occurrence in the wild, courtesy of Google. I've looked at approximately 250 event-denoting nouns, both simplex and derived, that fit in one of Vendler's 'narrow containers', but have not found any mass event-denoting, argument-taking nouns that accept 'frequent' modification which do not have a related verb. This is consistent with the observation of Zucchi's (as attributed by Grimshaw and cited in Borer 2003:47) that no AS nominals exist which are not formed from a verb

- (23) the frequent rape of women in Darfur
However, each side did allege **frequent rape of** its women civilians by the other's soldiers.
- (24) the frequent collapse of the king
Various manifestations of these phenomena have long been known to industry and agriculture, including the **frequent collapse of** grain silos, the jamming of hoppers or other equipment,
- (25) the frequent repair of the motorcycle
Repeated failure to take care of the instrument in this manner will necessitate **frequent repair of** the fluidic system, with resultant instrument downtime.
- (26) the frequent censure of journalists
It is already the case that, because the enforcement of current regulations requires **frequent censure of** personnel performing special fluoroscopic procedures, many personnel do not comply with existing requirements
- (27) the frequent murder of journalists [contra Borer 2002:22 as cited by Alexiadou¹⁷]
...as evidenced by widespread poverty and **frequent murder of** judicial and governmental officials.
- (28) the frequent capture of illegal immigrants
...especially to the marine prisoners, whose numbers were rapidly increasing, owing to the **frequent capture of** American privateers by the king's cruisers.
- (29) The frequent defeat of the Korean forces...
..."hard-core" partisans (the "wingnuts") are becoming an increasingly larger proportion of those voting, which contributes to the more **frequent defeat of** moderate candidates.
- (30) The frequent practice of good brushing habits
The frequent practice of this discipline will enable you to understand and know yourself better inside and out.
- (31) The frequent outbreak of disease in refugee camps
The **frequent outbreak of violence** in Lower Assam is a reminder that the Bodoland Accord, which paved the way for the formation of the BAC, has failed to...
- (32) frequent meltdown of the reactor
...the violence of simulated "true shows", or the **frequent meltdown of** sanity and basic civility on talk shows...

These nouns, too, when they are coerced count nouns, lose their internal arguments, or at least become considerably more infelicitious with them:

¹⁷ Google returns approx 473 hits for “frequent murder of”, vs. 451 for “frequent murders”

(without *of*).

- (33)
- a. a rape (??of a woman)
 - b. a collapse (??of a table)
 - c. a repair (??of a motorcycle)
 - d. ??a censure (?? of a journalist)
 - e. a murder (??of a journalist)
 - f. a capture (??of a prisoner)
 - g. an outbreak of disease
 - h. a meltdown (??of a reactor)

If these nouns are just regular complex event nominalizations with a null nominalizer, they can't tell us anything different than argument-taking nouns like *destruction of the city* can. Testing them with temporal modifiers is somewhat inconclusive ("The capture of the prisoner in only three hours" seems fine, but "??The repair of the motorcycle in only three hours" is quite odd to my ear, for example).¹⁸ If they *are* genuine examples of structurally simplex event nominals, however, then they can tell us something: they tell us that when an argument-taking mass event nominal without any internal verbal structure is transformed into a count noun, it loses its internal argument. That is, perhaps these nominals suggest that the licensing of *of*-marked argument NPs is blocked by the count-noun-deriving process, rather than by loss of internal verbal structure.

6 Conclusions

In a framework in which every piece of morphology must have a structural correlate, morphology can guide our conclusions about syntax and semantics, and vice versa. In order to avoid vacuity, however, morphology must be taken seriously: complex morphological structure

¹⁸ On the other hand, the fact that the only cases of such simplex nouns that I found all have related verbs suggests that they might well be deverbal in the relevant way, i.e. they are complex nominals with null nominalizing morphology.

cannot just be ignored when it seems to be making odd syntactic and semantic predictions. In this paper, I have presented nominalizations as a test case of this hypothesis, using syntactic facts to derive conclusions about the morphology (position of nominalizers in the structure), and then using morphological facts to derive conclusions about the syntax (position of verbalizers within nominalizations). Like any strong hypothesis, this one can lead to difficulties when pushed to its logical conclusion; I hope to have at least suggested that the particular difficulty posed by the puzzle of result nominalizations may have a plausible explanation within the bounds of the theory.

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