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# Cyclicity versus Movement: English Nominalization and Syntactic Approaches to Morpho-phonological Regularity

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## **Cyclicity versus Movement: English Nominalization and Syntactic Approaches to Morpho-phonological Regularity**

In this paper, I show that Embick's (2010) cyclic head approach to regular morphology alone cannot account for the freely available variations in the realization of nominalizers in English nominalizations involving overt verbalizers. Instead, I offer an account of the regularity effects using the technology of Local Dislocation (Embick and Noyer 2001, Embick and Marantz 2008, Embick 2007a, 2007b). Using this analysis, I derive both the variable nominalization patterns and the restrictions on particles and results in derived nominals from Sichel (2010). By treating regularity as the by-product of extant morphosyntactic operations, we can better explain the distribution of regular and irregular nominalizers and account for particle/result restrictions in English derived nominals.

**Key Words:** Regularity, Head Movement, Distributed Morphology, Cyclicity, Nominalization

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## 1. Introduction

The role of syntax in determining the presence of (construction-wide<sup>1</sup>) regular or irregular morphology is of particular concern to theories of grammar with unified morphological and syntactic architecture (e.g., Distributed Morphology (Halle 1990, Halle and Marantz 1993, 1994, Noyer 1997, Harley and Noyer 1999)). Under such an approach, (ir)regularity should be determined by locality constraints imposed by the syntactic derivation and not by any lexical or purely morphological processes. In this paper, I show how the syntactic derivation can wholly account for (ir)regularity in English deverbal nominalization.

English nominalizations pose a particularly interesting problem for theories of regularity (both lexical-based and syntactic-based approaches) because two constructions, derived nominal and nominal gerunds (also known as mixed nominalizations), appear to have virtually identical syntactic distributions and effects, but radically different morphological properties. Both are modified by adjectives, *of*-mark their objects, and have optional subjects; but derived nominals have irregular and idiosyncratic categorial affixes, while nominal gerunds have completely regular affixes.

(1) destroy:

- a. The Romans' destroying of the city...
- b. The Romans' destruction of the city...

(2) introduce:

- a. The chairman's introducing of the board...
- b. The chairman's introduction of the board....

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<sup>1</sup> Further addressed in section 2.

(3) marry:

- a. The marrying of flutes and violins...
- b. The marriage of flutes and violins...

To address this issue, I modify Embick and Noyer's (2001) proposal that there are three distinct syntactic operations by which affixes can join their stems<sup>2</sup>: head-movement (pre-PF), Lowering, and Local Dislocation (see also: Embick and Marantz 2008, Embick 2007a, 2007b). Under the modified version of the account offered here, head-movement is the environment in which much of the morphological irregularity is triggered; this is because such movement necessarily precedes Vocabulary Insertion (VI). I argue that Lowering is a process that occurs after narrow syntax but before or at VI—thus allowing some irregularity. Local Dislocation occurs post-VI and associated forms are completely regular. The fundamental difference between Local Dislocation and Lowering in this account is the nature of the syntactic features (interpretable or uninterpretable) of the relevant heads.

This model can account for the differences in morphological regularity between derived nominals and gerunds while also capturing the generalization that English derived nominals disallow particles and results while English nominal gerunds allow them (Pesetsky 1995, Marantz 1997a, Harley and Noyer 2000, Alexiadou and Schäffer 2007, Sichel 2010). I show that Sichel's event-structure based approach cannot adequately capture the facts, but a purely morpho-syntactic account in which derived nominals are subject to overt head movement, and nominal gerunds to Local Dislocation, can.

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<sup>2</sup> I use the term *stem* only as a descriptive term to discuss morphological environments where multiple affixes are present. I do not mean to assign any theoretical importance to the terminology. See Embick and Halle (2005) for more discussion.

I assume a three-way distinction in the forms of English nominalization: 1) derived nominals, which have specialized morphological nominalizers, of-marked objects, and adjective modification; 2) verbal gerunds, which are nominalized with –ing, do not of-mark objects, and are modified by adverbs; 3) nominal gerunds, which are nominalized with –ing, of-mark objects, and are modified by adjectives. The distinction between these three constructions is seen in the examples below:

- |  |                   |
|--|-------------------|
| (4) The Viking’s quick construction of a new ship... | (derived nominal) |
| (5) The Viking’s quickly constructing a new ship...  | (verbal gerund)   |
| (6) The Viking’s quick constructing of a new ship... | (nominal gerund)  |

This three-way distinction among English deverbal nominalizations is discussed in great detail in Chomsky (1970) (though this work draws heavily from Lees (1960)). Chomsky argues that verbal gerunds are the output of syntactic operations while derived nominals are the product of the lexicon and that nominal gerunds have mixed lexical and syntactic properties. This latter claim leads him to term this construction “mixed nominalization” (because it has mixed properties between verbal gerunds and derived nominals). Because I am not following this assumption, I adopt the more theory-neutral term of “nominal gerund”. The current discussion largely focuses on differences between nominal gerunds and derived nominals.

I also contrast the type of post-syntactic morphosyntactic operations found in nominal gerunds (Local Dislocation) with those found in Lowering contexts like English tense. I argue that the determining factor between whether an item will lower or be locally displaced is the interpretability of the triggering syntactic features.

This analysis is compared with Embick’s (2010) proposal where regularity is determined by the presence of intervening cyclic (phase) heads. For Embick, a head that is separated from

another head by at least two cyclic heads (counting itself) will always exhibit regular morphology. I show that Embick's cyclic head analysis cannot predict the presence of both regular and irregular morphology in nominalizations involving overt verbalizers. Nor does the cyclic head proposal account for the lack of particles or results in English derived nominals. Under both Embick's (2010) approach and the approach offered here, regularity is fundamentally a property of syntactic locality; however, that locality is defined derivationally here and representationally in Embick.

Evidence for a derivational approach comes from the behavior of particles and results with respect to nominal gerunds and derived nominals. Sichel (2010) notes that nominal gerunds allow particles and results while derived nominals do not. Under the movement-driven approach to regularity offered in this paper, this restriction is a natural consequence.

All together, the analysis provides a succinct explanation for seemingly unrelated facts about English derived nominals and nominal gerunds. English derived nominals are morphologically irregular and disallow particles/results while English nominal gerunds are completely regular and allow particles/results. For both Embick (2010) and Sichel (2010), these facts are unrelated. However, under my account, both properties follow from the presence or absence of overt head movement.

This paper is structured as follows. Section 2 is a discussion of the theoretical importance of regularity and an introduction to the particular definition of regularity I use in this discussion. Section 3 addresses the limitations of Embick's (2010) proposal, showing why a cyclic head approach does not correctly capture the facts. Section 4 presents an alternative account of these nominalization facts based on the ordering of morphological merger. The properties of Lowering and Local Dislocation that derive the phenomena are discussed in Section 5. In section 6, I

explain how the generalization about the lack of particles and results in derived nominals can be subsumed under the analysis provided for regular/irregular morphology developed in the previous sections. I conclude, in section 7, with a discussion of the potential benefits of the analysis offered here.

## **2. Regularity and Theories of Grammar**

The term “regularity” covers a range of linguistic phenomena. There is not a universally accepted definitional distinction between what is “regular” and what is “irregular”. Harley and Noyer (1999) note, “it is often thought that there is a gradient between suppletion and other types of more phonologically regular allomorphy, and that no reasonable grounds can be given for how to divide the two or if they should be divided at all” (p. 12). However, there is arguably a reasonable and necessary distinction between predictable and productive morphological forms and unpredictable and less productive ones. Further, this distinction is one that requires theoretical attention. Such a view is certainly argued for in Embick (2010).

The primary concern of this paper is the differences in the morphological realization of derived nominals and nominal gerunds:

- |  |                   |
|--|-------------------|
| (7) The Romans’ quick destruction of the city... | [derived nominal] |
| (8) The Romans’ quick destroying of the city...  | [nominal gerund]  |

What makes these constructions so compelling for a study of regularity is the apparent similarities of their syntax and semantics contrasted with their radically differing morphological statuses. If we imagine regularity as a spectrum, nominal gerunds would inhabit one side of the scale (complete regularity) while derived nominals would be near the other end<sup>3</sup> (idiosyncrasy

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<sup>3</sup> Fully suppletive forms should likely be considered “more irregular”, but it is my view that suffixation in derived nominalization should be viewed as a form of affix suppletion.

and irregularity). It is my hope that by first developing a theory to explain the edges of the regularity spectrum, we can narrow in and explain the muddled middle of regularity.

For this discussion, it will be critical to establish a clear definition of regularity. In this analysis, I am discussing regularity as a construction-level phenomenon. I consider a construction to be “regular” if all morphological instantiations of the construction are based on productive, consistent morphophonological processes (save principled exceptions). Nominal gerunds appear to be exception-less. Comparatives and superlatives have full Root suppletion with good (better, best) and bad (worse, worst). However, following Marantz (1997) these forms are light elements which are derived differently and thus are not true counterexamples. But such exceptions follow a different derivational path. Constructions that exhibit some regularity and some (unpredictable) irregularity are considered “irregular” for the purposes of this analysis. To be clear, I am not intending to assign any theoretical importance to the construction; rather I am assuming that regularity is a derivational property. Any instances of irregularity within a construction define that construction as irregular.

For instance, English tense and English plural both exhibit a great deal of regular, phonologically predictable morphology (*kick ~ kicked/dog ~ dogs*). However, there are numerous exceptional forms as well (*break ~ broke/ox ~ oxen*). As such, for the purposes of this analysis, both constructions are considered “irregular” regardless of the relative proportions of predictable (elsewhere) morphology and irregular morphology. I am not differentiating suppletion from other forms of irregular morphological processes.

## **2.1 Regularity in Distributed Morphology**

Within DM there is considerable discussion of the status of suppletion and other irregulars.

Suppletion is argued to be a property only of functional projections (Marantz 1993, 1997b; see



also:Harley 2011b, Bonet and Harbour 2012, Haugen and Siddiqi 2013, Harley 2014, for objections). We can contrast suppletion with other forms of irregular morphology that are traditionally analyzed via Readjustment Rules in DM (first proposed in Chomsky and Halle 1968). Irregularity derived via Readjustment Rules differs from suppletion because Readjustment Rules have “the limited expressive power of phonological rules” (Embick and Halle 2005:17), while suppletion is unconstrained phonologically. Readjustment Rules could be seen as possible rules of regular morphology for a given language, just not the regularly utilized ones.

In contrast, Siddiqi (2009) builds a DM model without Readjustment Rules; instead, irregular forms have their own Vocabulary Items and compete for insertion like other morphological forms. Essentially, under this view, all irregularity is suppletion.

Either of these views is more or less compatible with the analysis provided here. Whether irregularity is derived via Readjustment Rules and suppletion or just suppletion is irrelevant to the discussion. Suppletion and Readjustment Rules are processes that occur at or immediately following Vocabulary Insertion—as such, the syntactic processes that allow them must occur before VI.

It is certainly worth questioning why some irregular constructions exhibit greater degrees of regularity than others. English tense is largely regular with a few exceptions, while English derived nominals are virtually completely irregular. The analysis provided here seeks to explain only why some constructions are regular and others irregular.

Critically, the processes that underlie completely regular forms (such as nominal gerunds) and highly irregular forms (derived nominals) should be distinct enough to account for the differences while still maintaining the connections between the derived forms and their source.

Whatever theory we develop should recognize the connections between *destroy*, *destruction*, and *destroying* while also explaining the idiosyncratic nature of the morphology in the derived nominal *destruction*.

## **2.2 Other approaches to regularity**

There are many possible approaches to this issue that can capture the split. In the Lexicalist Hypothesis (Chomsky 1970, Jackendoff 1975), both regular forms, like gerunds, and irregular forms, like derived nominals, are the outputs of separate processes. Under this framework, derived nominals are the output of lexical processes that precede the syntactic derivation, while gerunds are the output of the syntax. There is thus a principled distinction between regular and irregular forms in such a view. Irregularity is found through lexical processes, while regularity is tied to syntactic ones.

There is considerable intuitive appeal to such an account. Because the link between a lexical form and the derived nominal suffix it takes is somewhat arbitrary, it seems reasonable to consign it to the part of the grammar most associated with arbitrariness. Arbitrariness of lexical content was a critical insight of de Saussure's (1916 [1983]) foundational work. Aronoff (1976) notes that "[t]he lexicon is conventionally viewed as the repository of all the arbitrary items of a grammar (cf. Chomsky (1965) and Bloomfield (1933)), and within our framework these exceptional items will for the most part be (derivational) words" (p. 43).

However, without a principled method of determining when a morphological process is located in the lexicon or in the syntax, such a dual process view is merely restating the observation in theoretical terms. If derived nominals are lexically derived, there must be an underlying reason as to why. The same is true with the syntactic derivation of gerunds.

We could potentially cast the distinction between lexically derived morphological processes and syntactically derived ones in terms of Anderson's (1982) distinction between derivational and inflectional morphemes. Blevins (2006) categorizes English gerunds as instances of inflectional morphology. Anderson (1982) uses nominal gerunds to show that the link between regularity/productivity and inflection and derivation is not definitional: "one might legitimately question the status of this formation [gerunds] as inflectional or derivational; but there is surely no issue in the case of action nominals [nominal gerunds<sup>4</sup>]" (p. 585). Inflection need not necessarily be regular or productive and derivation can be both. As such, explaining regularity in nominalization in these terms is unlikely to be fruitful.

Chomsky's (1970) discussion of nominal gerunds (which he terms "mixed nominalization") is quite sparse, though he is openly skeptical as to whether the Lexical Hypothesis that he advocates for can extend to the construction: "...it seems that the transformationalist [syntactically derived] hypothesis is correct for the gerundive nominals [verbal gerunds] and the lexicalist hypothesis for the derived nominals and perhaps, though much less clearly so, for the mixed forms [nominal gerunds]" (p. 215). If nominal gerunds are derived in the lexicon, then the principled divide between regularity and derivational source is completely lost. If they are syntactically derived, then any hope of clarifying what it means for a given process to be syntactic or lexical would be lost. Nominal gerunds and derived nominals both involve overt category shift and are found in nominal syntactic environments; also, both vary between event and result readings.

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<sup>4</sup> See Fraser 1970, Wasow and Roeper 1972, Zucchi 1993, Katz 1999 and Hamm 1999 for use of this terminology and further discussion.

We can contrast a split-process analysis (i.e. Lexicalism) with a single-process analysis. Such analyses are strongly associated with Distributed Morphology (Halle and Marantz 1993, 1994; Harley and Noyer 1999; Marantz 2001), but versions of such approaches predate the framework. Lees (1960) and Lakoff (1971) offer transformational accounts of derived nominalizations. Such accounts can be seen as antecedents of the DM-style approach to single-process morphology, since transformations were part of the syntactic architecture of the time. However, both suffer from a seemingly arbitrary distinction between lexical items, transformational rules and regularity. Lees' (1960) transformations are virtually unconstrained and provide no immediate answer to why transformations should produce irregular forms (which is the object of the present study). In Lakoff's (1971) approach lexical items are pretagged for transformations in a way that reconstructs parts of the dual-process approach (see Jackendoff 1975 for more objections).

More modern, DM accounts (see Harley and Noyer 1998, Alexiadou 2001, Harley 2009, Embick 2010, Alexiadou, Iordăchioaia and Soare 2010, Punske 2012, among others<sup>5</sup>) of the relevant phenomena avoid the problems faced by the earlier syntax-based approaches to derived nominalization. Perhaps the clearest illustration of this point is found in Marantz (1997a) who observes that updating the syntactic framework from an (Extended) Standard Theory transformational model to a Bare Phrase Structure model puts what were unconstrained (and

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<sup>5</sup> This work largely focuses on Embick's analysis, with some discussion of the other work. Ultimately, this work is an explanation of the regularity facts—not the many other structural and selectional differences discussed by this literature. While the structural differences are almost certainly tied to the regularity facts, I believe that the particular analysis I offer here is compatible in varying degrees with the different accounts offered in Harley and Noyer (1998), Alexiadou, Iordăchioaia and Soare (2010) and Punske (2012).

unexplained) derived nominal processes from transformations (as in Lees 1960) in the lexicon—thus shifting the explanatory burden from those who want to put nominal derivation in the syntax to those that want to keep it out. Marantz further notes that if derived nominalization is a lexical process then the fact that *growth* is obligatorily intransitive is completely unexplained (or stipulative).

Outside of Embick (2010), few have attempted to explain the regularity contrast in (nominal) gerunds and derived nominals—though, as we saw earlier, the status of regularity within DM is controversial. Harley and Noyer (1998) argue that nominal gerunds and derived nominals are the same construction. Under this view, *-ing* is an elsewhere case when no other specified derivational suffix is found. Presumably, regularity could be derived through an elsewhere analysis given that elsewhere-morphemes are defaults. However, this analysis faces significant challenges in the availability of both nominal gerunds and derived nominal for large quantities of forms (see Punske 2010, 2012 for more discussion).

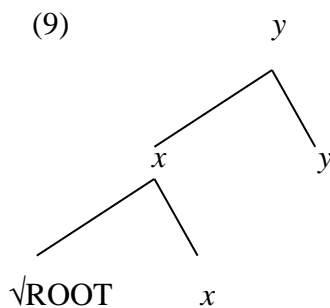
This leaves open the question: is it possible to systematically account for (ir)regularity? As we've seen, a dual-process (lexicon + syntax) analysis cannot capture the difference between regular and irregular processes via a lexical/syntax split; irregularity must either be arbitrarily found in the lexicon or what processes are lexical must be arbitrarily determined in such a system. Embick (2010) attempts to account for regularity within the framework of DM, but as we will see shortly this account appears to be unable to account for nominal gerunds.

What I propose is a single-process DM-style account of morphological regularity in English nominalization. This proposal distinguishes among three different types of morphosyntactic operations that systematically determine the (ir)regularity of a given form.

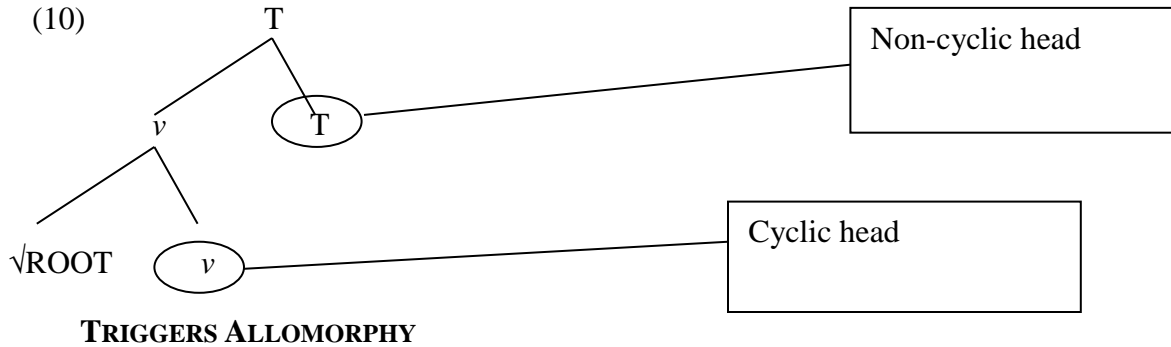
Overt head movement and Lowering both precede Vocabulary Insertion and are thus sources of irregularity. Local Dislocation follows VI; therefore complete regularity follows.

### 3. Regularity in Embick (2010)

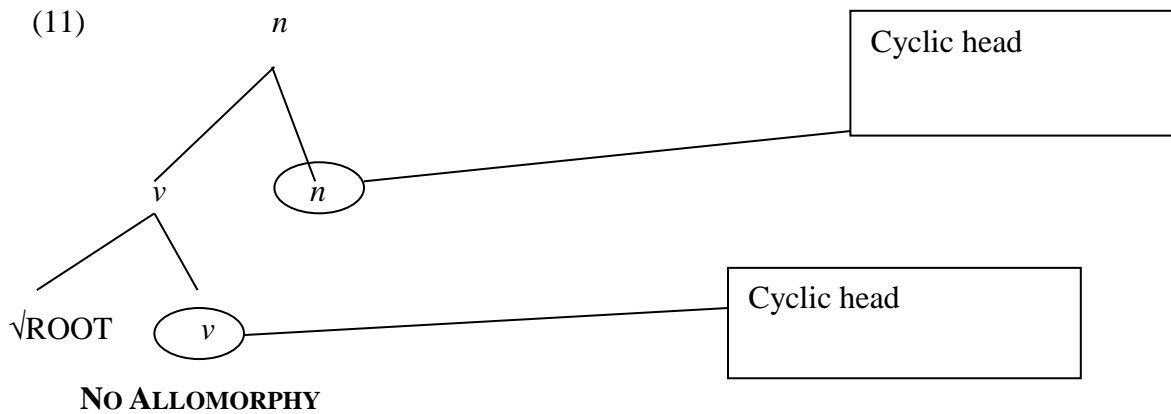
Embick's goal is to account for all suppletive allomorphy within a syntax-all-the-way-down model. Under this approach, suppletion is conditioned by local syntactic relations and phonology's role is reduced to regular processes (see Haugen 2011 for critique). Embick's account of regularity is based on a simple principle: outer cyclic heads cannot show allomorphy when an inner cyclic head intervenes. Following Marantz (2007), Embick assumes that all category assigning  $x$  heads ( $n$ ,  $v$ ,  $a$ , etc.) are phase heads.



In the structure in (9), if  $x$  and  $y$  are both cyclic heads then  $y$  and the ROOT cannot trigger allomorphy on each other. Because  $x$  and  $y$  are adjacent, allomorphy between the two of them should be possible. If either  $x$  or  $y$  is non-cyclic, then allomorphy between the ROOT and either of the heads should be possible (as in English tense inflection). Because there is only a single cyclic head in the relevant structure, T and the ROOT can trigger allomorphy on each other:



When both are cyclic heads, then neither the Root nor the outer head should be able to trigger allomorphy (as in gerunds):



Cyclic heads trigger spell out—following Chomsky (2001), Embick assumes that only the complement is immediately spelled out and that the edge (the cyclic head and its specifier) are not immediately spelled out. Once material has been spelled out, it is no longer available to the phonological interface. In Embick’s analysis a cyclic head spells out its complement when a higher cyclic head is merged.

I illustrate this process using the structures (10) and (11) above. In both structures the ROOT is the complement to a cyclic head *v*; thus, the ROOT will be spelled out whenever another cyclic head is merged above *v*. In the structure in (11), *n* is a cyclic head and the moment it is merged, *v* spells out its complement, ROOT. This ROOT is no longer eligible for any phonological operations of the higher cyclic head (in this case *n*). In the structure in (10), T is not

a cyclic head. When it merges, *v* does not spell out its complement and thus the ROOT is still visible to T.

Within English nominalization we can see both patterns quite clearly. Derived nominals are massively idiosyncratic and exhibit allomorphy in both the suffix and the stem. On the other hand, gerunds (both nominal and verbal) have only one nominalizing suffix (*-ing*) with no stem allomorphy. This point is illustrated in examples (12)-(14).

(12) destroy:

- a. The Romans' destroying of the city...
- b. The Romans' destruction of the city...

(13) introduce:

- a. The chairman's introducing of the board...
- b. The chairman's introduction of the board....

(14) marry:

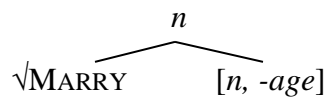
- a. The marrying of flutes and violins...
- b. The marriage of flutes and violins...

Crucially, nominal gerunds are not blocked by the existence of a derived nominal, but coexist peacefully. This data poses a major challenge for an Embick-style analysis. As we will see, there cannot be a difference in the number of intervening cyclic heads—yet both the regular and irregular morphological forms are found. Even if we were to treat *-ing* as an elsewhere nominalizer, we would have no explanation for why it can be found when irregular morphology is also permitted in an Embick-style account.

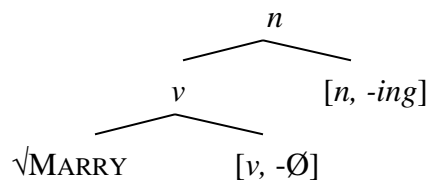


By focusing more narrowly on nominalization, we can clearly see the applications of Embick’s approach and the examples that it fails to capture. For Embick, the crucial distinction between regular forms of nominalization (gerunds) and irregular ones (derived nominals) is the attachment site of  $n^0$ : “In special nominals, the  $n$  head realized as *-ter*, *-age*, *-(t)ion*, and the like is Root-attached. In gerunds, on the other hand, the nominalizing  $n$  morpheme attaches to structure that is verbalized by  $v$ ” (Embick 2010, pg. 15).

(15) Embick’s derived nominal structure (*marriage*):



(16) Embick’s gerund structure (*marrying*):



It is important to note that Embick was not concerned with nominal gerunds, and it is not completely clear where they would fit in this analysis. Nominal gerunds exhibit complete morphological regularity but share little other than phonetic form with true gerunds. True gerunds and nominal gerunds differ with respect to a number of properties. True gerunds can be formed out of any verb phrase (Lees 1960). They must be modified by adverbs not adjectives; may have auxiliaries; directly assign Case to their object arguments; have obligatory subjects (Lees 1960, Chomsky 1970, Abney 1987, Baker 2005, among many others).

Nominal gerunds are modified by adjectives; may have no auxiliaries; do not directly assign Case; do not have obligatory subjects. Following Abney (1987), Borer (1993), Kratzer

(1994), and Alexiadou, Iordăchioaia and Soare (2010) (among many others), I assume that verbal gerunds have (more) internal verbal projections while nominal gerunds have fewer or no internal verbal projections<sup>6</sup>. Kratzer (1994) notes that “the fact that the direct object of *of<sub>ing</sub>* gerund cannot receive accusative case *has to be taken as a sign that the nominalized constituent does not contain Voice*” (p. 122, emphasis mine). Alexiadou, Anagnostopoulou and Schäfer (2009) note that *–(a)tion* nominals lack a Voice projection because the external argument is not realized obligatorily and there is no accusative case assignment—properties shared with nominal gerunds. Punske (2010, 2012) further argues that nominal gerunds are syntactically less complex than derived nominals based on structural (binding, NPI-licensing) and interpretative (loss of idiomaticity) facts. Regardless of the particular analysis of nominal gerunds, the availability of this third form of nominalization is not accounted for in Embick’s (purposefully limited) system.

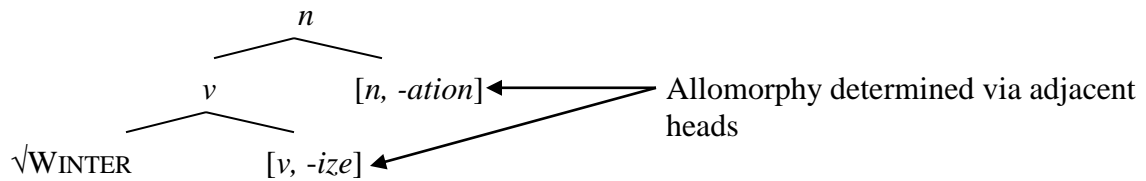
There are other reasons to question this analysis on both empirical and conceptual grounds. The relevant examples concern stem-allomorphy of forms with overt verbalizers. If we take Embick’s analysis at its face and assume that the critical determiner of the phonological form of a given nominalizer is the presence or absence of an intervening (null) cyclic head, then stem-allomorphy provides an excellent Petri dish.

The nominalizer *–(a)tion* associated with derived nominals can also appear on verbs formed with the verbalizer *–ize* (i.e., *winterize ~ winterization*). This fact poses no direct problems for Embick’s analysis because there is no ban on allomorphy being determined by an adjacent morpheme. In such forms, the presence of *–ation* is determined by the verbalizer and not by the Root:

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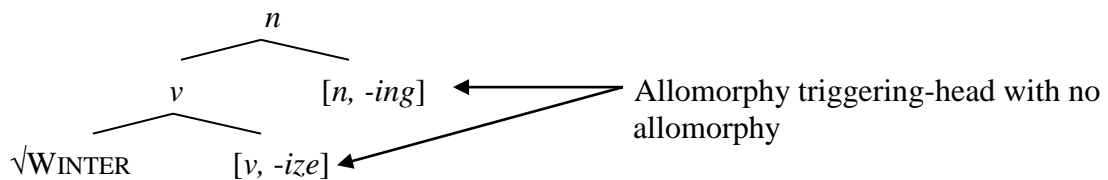
<sup>6</sup> For instance, see Alexiadou (1997) and Cinque (1999) for arguments that verbal gerunds contain AspP, which nominal gerunds almost certainly do not (as in Alexiadou, Iordăchioaia and Soare 2010).

(17) Stem-allomorphy



The problem lies with the availability of the unmarked, non-contextually specified nominalizer *-ing*. Under Embick’s analysis the presence of the generic nominalizer *-ing* is unexpected. If regularity is tied to syntactic adjacency then the availability of both the regular and an allomorphic form is unexpected.

(18) A failure of allomorphy



Embick recognizes the *-ization/-izing* choice problem for his account of regularity. He argues that the distinction is due to a difference in the *voice* head contained within each form of nominalization. For gerunds, a “(transitive) voice[ag] head” is present (see Embick 2010: 95). Derived nominals lack this form of voice. This analysis would capture the distinction between verbal gerunds and derived nominals, since verbal gerunds do assign accusative Case to their objects (and require agents).

(19) John’s colorizing the movies...

(20) John’s colorization of the movies...

((19) and (20) from Embick 2010: 95)

However, it is extremely difficult to see how this analysis can be extended to the nominal gerund facts discussed in this paper. Recall, as Kratzer (1994) noted, that nominal gerunds display none of the syntactic effects we would expect if *voice* were present. Nominal gerunds do not assign accusative Case nor do they have obligatory agents. Thus, the choice problem remains a major hurdle for an Embick-style analysis.

I am unaware of any analysis of nominal gerunds that argues for the existence of an additional cyclic head between the *v* and the *n* in an example like (18). Chomsky (1970) does not provide a definitive analysis of nominal gerunds. Harley and Noyer (1998) argue that nominal gerunds and derived nominals are actually instantiations of the same construction with different morphology (*-ing* being an elsewhere case when the Root/stem doesn't trigger allomorphy). Harley and Noyer face the same problem with *winterization* and *winterizing*<sup>7</sup> as Embick: only one of these non-accusative Case assigning forms should exist.

Though, as noted in review, some analyses of gerunds treat *-ing* not as the nominalizing element but as some other piece of morphological structure (cf. Jackendoff 1977). Ackema and Neeleman (2004) offer such an account based on a principled avoidance of homophony: “[a]n analysis of nominal gerunds as involving overt affixation must therefore rely on a homophony for which there is no independent evidence” (p. 178). Indeed, to the extent that homophony of this sort is viewed as a problem it is a drawback to the approach that I outline here. However, it is an open question whether such aggressive approaches to homophony is required. Regardless, such an approach requires that nominal gerunds have overt verbal syntactic structures which is somewhat similar to Embick's analysis—though Embick, like the present work, also realizes *-ing* in *n*<sup>0</sup>.

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<sup>7</sup> Google searches show consistent use of both forms to roughly mean preparing something for cold weather.

In contrast, Punske (2010, 2012) argues that nominal gerunds are structurally *less* complex than derived nominals based on argument structure facts. Under Punske’s (2012) analysis, the presence of a *kP* (adapted from Lamontagne and Travis (1987)) above the nominalizer is found in derived nominals, but not in nominal gerunds. This *kP* is the locus for a form of Case assignment in derived nominals. Nominal gerunds are argued to lack true arguments and contain adjunct PPs which appear on the surface similar to derived nominal arguments but are structurally distinct. The arguments for this higher projection come from differing structural configurations in nominal gerunds and derived nominals, in particular nominal gerunds’ lack of c-command relations between arguments in ditransitives, illustrated in (21), and by the fact that nominal gerunds and derived nominals cannot be conjoined (suggesting they have different maximal projections).

(21) \*John’s introducing of no boys to anyone... [lack of c-command<sup>8</sup>]

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<sup>8</sup> A reviewer notes that the ungrammaticality here may not be due to c-command facts but with other factors concerning negation in English nominalizations. For instance, as noted in van Hout, Kamiya and Roeper (2013) nominal gerunds do not allow wide scope of negation, while (some) derived nominal do:

- (i) The finding of nobody was a surprise.
  - ‘What was surprising was the fact that nobody was found.’                      Narrow
  - # ‘Of those found, nobody was a surprise.’    Wide

van Hout, Kamiya and Roeper (2013, ex. 16, 146)
  
- (ii) The election of nobody last year surprised us.
  - ‘No one was elected and that was surprising.’                                      Narrow
  - ‘As for those elected, none of them surprised us.’                                      Wide

van Hout, Kamiya and Roeper (2013, ex. 18a, 146)

Contrast with:

- a. John's introduction of no boys to anyone...
- b. John introduced no boys to anyone...

(22) \*The Romans' destruction of and pillaging of the city... [lack of conjunction]

Contrast with:

- a. The Romans' destruction of and reconstruction of the city...
- b. The Romans destroyed and reconstructed the city...

I argue below that by adopting this proposal, we can explain the (ir)regularity effects found across the different forms of nominalization. In particular, if we assume that the higher  $k^0$  is present in derived nominals, but not gerunds, triggers cyclic head movement of the ROOT, then the regularity effects and the availability of both constructions in overtly derived verbal contexts can be readily explained. The details of this proposal are further developed in the next section.

#### 4. Deriving Regularity in Nominalization

The availability of both a nonconditioned (regular) and conditioned (irregular) nominalizer in forms with overt verbalizers (*-ing* and *-ation* respectively, from the *winterize* examples in the

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It isn't entire clear why the lack of wide scope would prevent NPI licensing in the relevant construction above.

Rather, I take this difference as further evidence that the apparent objects of nominal gerunds do not have the same status as the objects of derived nominals—which is a happy result for the current analysis.

A similar objection can be found in Fraser (1970) which critiques in Wasow and Roeper (1972) and Alexiadou (2001).

previous section) clearly illustrates that whatever may be conditioning Root-affix (ir)regularity, it cannot be the presence or absence of intervening cyclic heads, since *v* is the canonical example of a cyclic head. If a syntactic account of this type of (ir)regularity can be preserved, another syntactic process must be found to be at play. As noted in Matushanky (2006), head movement is generally thought to feed affixation. In this section, I argue that the fundamental difference between the highly regular nominal gerunds (all marked with *-ing*) and the highly irregular derived nominals (nominalizers idiosyncratic to ROOT/stem) is instead the presence or absence of overt head movement.

Derived nominals involve head movement of the ROOT/stem into  $n^0$  while nominal gerunds do not—the motivation for movement (or not) is addressed in section 5. Because of this head movement, the conditioning environment necessary for irregularity of this type is visible in derived nominals. In nominal gerunds, which lack head movement, the ROOT/stem is invisible to  $n^0$  so no irregularity is possible. The nominalizer *-ing* and the ROOT/stem are affixed post-syntactically in a modified version of Local Dislocation (Embick and Noyer 2001, 2006).

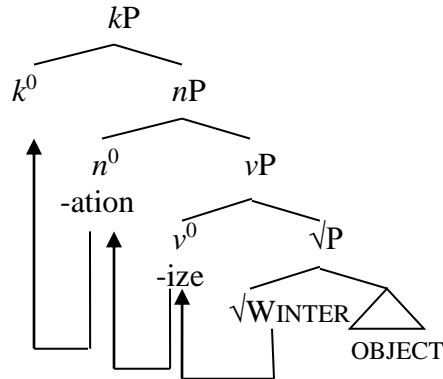
Like Embick, I assume that allomorphy is subject to syntactic locality; however, I assume that head movement obviates locality restrictions. Hence, head movement can feed allomorphy while simple adjacency cannot. That assumption, coupled with the above analysis<sup>9</sup> of derived nominals, accounts for the availability of both *winterization* and *winterizing* when the  $v^0$  and  $n^0$  are in structurally identical positions. The relevant distinction between these structures is the presence of a higher head, which triggers cyclic head movement of the Root through  $n^0$ . As we

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<sup>9</sup> The overall thrust of the analysis offered could also hold without the *kP*, if the nominalizing head associated with derived nominals were itself the trigger for head movement. Such an analysis would lose explanatory power and is more stipulative since featural differences in  $n^0$  would be prespecified.

will see in the following section, *k* triggers movement because it contains an uninterpretable feature (Case), and uninterpretable features are triggers for overt head movement (and, as we will see below, Lowering<sup>10</sup>). As such, no special claims about the nominalizers themselves need to be made.

(23) Deriving stem-allomorphy



The derivation in (23) would produce *winterization* with its stem-conditioned nominalizer *-ation*. A stem-conditioned allomorph is able to occur in these constructions because the whole complex head [ $\sqrt{WINTER} + v^0 + n^0 + k^0$ ] is visible at Vocabulary Insertion. Essentially, the *n*<sup>0</sup> is able to see its morpho-phonological context at VI, which it is unable to do when head movement has not occurred. This account can explain both the stem-conditioned cases like *winterization* and ROOT-conditioned cases where the *v*<sup>0</sup> is null or not present (i.e., *destruction*, *growth*, *marriage*).

We can compare this derivation to the one I propose for gerunds, which lack the higher movement-inducing *k*<sup>0</sup>. Because no movement into *n*<sup>0</sup> occurs, Vocabulary Insertion views each

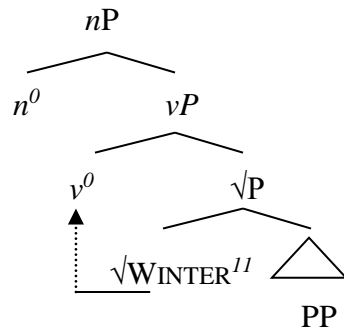
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<sup>10</sup> The choice between overt head movement and Lowering is likely subject to the individual lexical specifications of the functional projection. Hence, English *ks* trigger overt movement while English *Ts* do not. Both contain uninterpretable features and both must incorporate with a ROOT prior to VI to be realized, though the syntactic mechanisms behind each vary. This is clarified in section 5.



of the relevant terminals independent of the others (akin to Enlightened Self Interest (Lasnik 1995)). Allomorphy is not possible in this circumstance because the ultimate morpho-phonological environment is not visible, as seen in the structure of a nominal gerund below:

(24) Non-allomorphy in Nominalization



The  $n^0$  will always be realized by *-ing* in such a structure because at the point of Vocabulary Insertion the ROOT/stem and the  $n^0$  are not visible to each other. This particular point allows for some unification between the analysis argued for in this paper and Embick's (2010) analysis. In the structure in (21) the relevant heads would be in different phases. However, as we see throughout the paper, the analysis of these constructions can be accomplished entirely without reference to phases. For this analysis, I am assuming conditioned VI requires that the conditioned elements be incorporated via head movement. Because phases are the domains for many syntactic operations, including cyclic movement (Uriagereka 1999, Chomsky 2000, 2001, 2008, Legate 2003, Boeckx and Grohmann 2007, Gallego 2010) an overlap between regularity and phases is predicated by my analysis. However, unlike Embick, being within the same cyclic domain is not the only necessary precondition for irregularity; incorporation must occur as well. Though, at the cost of introducing this functional  $k$  head above  $nP$ .

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<sup>11</sup> Movement of the  $\sqrt{ROOT}$  into  $v^0$  in these structures is irrelevant to the current analysis.



- (26) twinkling /twink↔liN/ ‘the event of twinkling’ [gerund]  
 (27) twinkling /twinklīN/ ‘a short instant’ [nominal]

(20-21 modified from Marvin 2002: 36)

Marvin analyzes this difference via a phase-based approach. When schwa is not present, there is a phase head intervening between the nominalizing *-ing* and the ROOT and when schwa is not present, there is no intervening phase. Marvin argues that presence of the intervening phase triggers spell out of the ROOT, which then requires schwa phonologically. Marvin’s analysis shares a lot conceptually with Embick’s (2010) approach and is thus faced with the same problems distinguishing nominal gerunds and derived nominals outlined above.

However, Marvin’s insight that schwa is present because the affix *-ing* is not visible to phonological insertion is captured by the present analysis. Recall that at the point of phonological realization (VI) in the present model, *-ing* has still not been inserted. Thus, the phonological interface responsible for the phonological information associated with the Root is unaware of any affix and produces a form that can be pronounced without an affix (i.e., with schwa).

#### **4.2 An Alternative to *kP***

The advantage of the *kP* analysis advocated for here is that it ties both the (ir)regularity properties and the argument structure properties together quite nicely. The disadvantage is that there isn’t any other independent motivation for it at this time. An alternative noted both in review and by other commentators would be to have flavors of *n* (Folli and Harley 2005) with the properties associated with *k* in the above discussion essentially being the flavor of the derived *n*. The advantage of such an approach would be avoiding the need for the additional projection.

However, the obvious disadvantage being that prespecifying the features of *n* may be a backdoor way to reintroduce lexical regular/irregular distinctions. Throughout the rest of the paper, I will continue to follow the previously outlined *kP*-based analysis. However, the analysis is fully compatible with the alternative analysis should that be preferred.

### **4.3 Deriving Regularity**

Regardless of the particular derivational approach taken, it is very clear that a derivational account of nominalization can also account for the regularity of the morphology associated with the particular construction. Derived nominals involve incorporation of the ROOT into the *n* and thus allow for irregular morphology. Nominal gerunds do not involve incorporation; therefore their nominalizers and ROOTs are invisible to each other.

### **5. Distinguishing Lowering and Local Dislocation**

The analysis for non-allomorphy in gerunds provided in the previous section stated that the completely regular morphology of these constructions is due to the lack of head movement of the ROOT into  $n^0$ . Of course, the  $n^0$  and the ROOT must meet at some point before pronunciation because they are pronounced together. This can be accomplished through a form of post-syntactic movement.

Post-syntactic lowering analyses have a long history in generative syntax. Chomsky (1957) introduced such an analysis for the English tense system. Versions of this proposal have been periodically revived and further developed (see Emonds 1976, Halle and Marantz 1993, Bobaljik 1994, Embick and Noyer 2001). All of these analyses share the following philosophy expressed by Bobaljik: the relationship between a head and its affix “need not in all cases be derived in the syntax or the lexicon” (1994: 26).

However, if we consider gerunds and tense side-by-side, a major difference is readily apparent. While gerunds are completely regular, allomorphy exists in the English tense system. For obvious reasons, deriving English tense allomorphy through overt head movement of V to T is not an option. Embick's (2010) cyclic head account could capture the tense facts, without requiring such movement. However, the analysis offered in the previous section would seemingly predict total regularity or overt head movement—neither prediction is accurate.

To solve this problem, I appeal to Embick and Noyer's (2001) account of post-syntactic movement operations. Embick and Noyer distinguish between two distinct forms of post-syntactic lowering: Lowering and Local Dislocation. In their analysis, Lowering preceded Vocabulary Insertion while Local Dislocation followed it. Such an analysis can easily be used to capture regularity effects. If Local Dislocation follows VI, then the phonological forms of the inserted items must be determined independently of each other. Regular phonological processes and restrictions may still apply, but idiosyncratic/irregular morphology is impossible. In Embick and Noyer's (2001) account, English tense is an example of Lowering, while English comparatives and superlatives are an example of Local Dislocation.

Accounts of Local Dislocation do not specify explicitly under what conditions Lowering is expected and when Local Dislocation is expected. Here I propose that Lowering occurs when the relevant head contains an uninterpretable feature, and Local Dislocation occurs when the head has interpretable features<sup>12</sup>. I assume that the *-ing* found in nominal gerunds appears to only contribute category information (generally true of *n*). This is in line with discussions of the functional properties of *-ing* found in Alexiadou, Iordăchioaia and Soare (2010) and Punske

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<sup>12</sup> Substituting “valued” for “interpretable” should render the same results for a Pesetsky and Torrego (2006) based analysis.

(2012) respectively. Because category information is relevant to LF, we can assume that it is an interpretable feature. Given that this is all that *-ing* contributes, its place in the derivation falls out.

These results are exactly in line with Panagiotidis' (2015) theory of category assignment (building on Déchaine 1993 and Baker 2003) which holds that categorial features are LF-interpretable. [N] features force a sortal<sup>13</sup> interpretation and [V] features force an “extending-into-time perspective” at LF (see Panagiotidis 2015: 84).

This analysis is in line with the Embick and Noyer data. Following Panagiotidis 2015, the requirement that V and T meet in the derivation is due to an uninterpretable feature on T, which must be filled by a feature on V (see also Pesetsky and Torrego 2006, among others, for discussion). Under this approach, uninterpretable features must be checked before Vocabulary Insertion—but whether such features trigger raising in narrow syntax or Lowering would be subject to specifications in the featural make-up of the functional items that would vary cross-linguistically. Lowering would be a kind of Last Resort style morpho-syntactic repair operation that would correct for features that should have been eliminated by head movement but were not.

By contrast, comparatives and superlatives are purely semantic features and are thus interpretable. Clearly, the interpretability of features forms a natural divide between Lowering and Local Dislocation. If we assume that category assignment is also interpretable, the regularity facts follow from the Local Dislocation analysis.

Evidence for the interpretable status of the feature(s) associated with *-ing* comes from the acquisition of *-ing* coupled with Radford's (2000) observation that interpretable features are

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<sup>13</sup> Baker (2003) also proposes a sortal interpretation for [N]; Panagiotidis diverges from Baker in the details of the interpretation of sortality. This difference is not relevant to the present discussion.

acquired before uninterpretable ones (see also van Gelderen 2008). It has long been noted that progressive *-ing* is acquired quite early in L1 acquisition of English. Brown (1973) found that out of the 14 morphemes he analyzed *-ing* was the first to be acquired. Kuczaj (1976) also found that *-ing* was “the ‘easiest’ of the inflections and verb forms studied [in his study]” (p. 24). Roeper’s (1982) study on the acquisition of English gerunds showed that children between three and five already display a complex understanding of gerunds and are sensitive to the differences between verbal and nominal gerunds<sup>14</sup>.

While the evidence is not direct, the acquisition evidence definitely suggests that *-ing* realizes an interpretable feature in its various syntactic functions in English. This analysis has a number of benefits. Following Radford (2000), interpretable features are also easier to acquire. Regularity itself also plays a role in acquisition. Under the view advocated here, these two facts are intimately connected. Complete regularity and interpretable features are strongly associated with each other.

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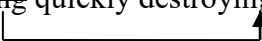
<sup>14</sup> We can contrast the early development of gerunds with the notably later development of derived nominals. Tyler and Nagy’s (1989) study of English derivational morphology suggests that the acquisition of derived nominal suffixes continues into at least 8<sup>th</sup> grade. Sixth grade students were found to make overgeneralization errors with derivational suffixes in that study. Such results are not limited to English: Ravid and Avidor (1998) found that acquisition of Hebrew derived nominals starts around age 8 and isn’t complete until age 15. I know of no studies comparing derived nominals and gerunds directly, but the trends are obvious.

Such evidence is inevitably tied up with issues of frequency and regularity. For instance, Slobin (1973) notes that “rules applicable to larger classes are developed before rules relating to their subdivisions, and general rules are learned before rules for special cases” (p. 205). A full discussion of these factors is well beyond the scope of this paper, but it is worth noting that other factors may be at play with respect to the acquisition of gerunds.

It is worth reiterating that the present analysis does not posit differences in the  $n^0$  associated with nominal gerunds and that associated with derived nominals. In both constructions the  $n^0$  would contain interpretable features (category) and would not trigger head movement itself. What distinguishes the constructions is the presence of the higher  $k^0$  in derived nominals. This projection, which is the locus for Case assignment on the internal arguments of derived nominals, does contain uninterpretable features.

One potential problem with adopting the Local Dislocation proposal for English gerunds (both nominal and verbal) is the apparent fact that adjuncts can intervene between the nominalizer and the ROOT<sup>15</sup>.

(28) The Romans' ~~ing~~ quickly destroying the city...



For Embick and Noyer, Local Dislocation is strictly tied to immediate adjacency; the fact that the  $n^0$  can seemingly cross over the adjective/adverb in the preceding examples should classify this movement as Lowering because Lowering does not require immediate adjacency. But if such movement is Lowering, it would be pre-VI and no explanation of the regularity effects would remain.

The evidence that Embick and Noyer provide for an immediate adjacency restriction comes from intervention effects of adverbs in comparative/superlatives<sup>16</sup>:

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<sup>15</sup> This assumes that the adjectives/adverbs are dominated by the  $n^0$ . If this is not the case then these examples pose no problems.

<sup>16</sup> Embick (2007a, b) offers further clarification to these examples and explains several exceptional examples which are derived through scope effects. Fundamentally, the analysis remains the same. The remarks I offer here apply to Embick (2007a, b).



(29) Mary is the mo-st amazingly smart person...

(30) \*Mary is the *t* amazingly smartest person...

((29) and (30) from Embick and Noyer 2001: 565)

If we assume that adjectives and adverbs may intervene between ROOTs and their nominalizers, then these examples cast immediate doubt on the Local Dislocation analysis of English gerunds. Why should gerunds be privileged in their ability to cross over modifiers? The answer to this problem is actually quite simple. I argue that the above examples are not evidence of an adjacency restriction per se, rather they are evidence of the morpho-phonological nature of Local Dislocation.

There is a confound in examples like (29) and (30): adverbs are potential hosts of comparative and superlative morphology. Though such modification is normally of the *more/most* type, some adverbs (marginally) can bear comparative/superlative morphology.

(31) Might easiliest harbour in? Thou blessed thing!<sup>17</sup>

(32) She turned around most quickly/quickest/???quickliest

Regardless of the acceptability of forms like *easiliest*, the fact that adverbs can have *more/most* modification is evidence of their potential ability to host the comparative/superlative morphology. The fact that they are generally unable to do so is likely due to the phonological size restrictions that drive *more/most* in the adjectival system and thus irrelevant to their potential as hosts.

With this in mind, the explanation for why (30) is unacceptable can be further refined from the intervention of any lexical item to the intervention of a potential morphological host<sup>18</sup>

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<sup>17</sup> Shakespeare, *Cymbeline*, Act IV, Scene II

<sup>18</sup> A reviewer notes that even this explanation seems too syntactic to be a PF operation. I agree to an extent that this proposal would require some revision to how we view PF (perhaps too much). However, as formulated here the

of the dislocated item. This is still fundamentally different than Lowering because the search is morphophonological and not syntactic, but adjacency is not necessarily required.

The benefits of this approach are seen in explaining why deverbal adjectives cannot co-occur with nominal gerunds while other adjectives are permitted.

(33) The quick destroying of the city...

(34) \*The baffling destroying of the city<sup>19</sup>...

(35) The baffling destruction of the city...

If we assume that Local Dislocation is a single computation over a non-hierarchical string then the ROOT  $\sqrt{BAFFLE}$  is closer to both of the *-ing* suffixes, since it is a potential host. Both *-ing* suffixes will attempt to attach to the closer ROOT, creating an illegitimate morphological object.

The Local Dislocation analysis captures the regularity of gerunds because morphological merger is a post-VI operation in these constructions and thus irregular morphology is not possible. It also captures the fact that deverbal adjectives and gerunds cannot co-occur through the competition of potential nearest hosts. However, it does force us to have a more elaborated theory of Local Dislocation in terms of morphological awareness, which some may find objectionable. It is possible that this modification may not be necessary provided that *-ing* and the ROOT can be made adjacent. In nominal gerunds, this would be much easier to do. However,

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operation is not sensitive to syntactic information—the stranded morphology is only looking for a legitimate morpho-phonological host. It is also worth reiterating that this modification is only required if we assume that adjective/adverbs can intervene between the nominalizer and the root, which is not a necessarily correct assumption.

<sup>19</sup> This example could be subject to other explanations such haplological dissimilation (c.f. Nevins 2012) or a variation of Ross's (1972) "Doubl *-ing*" constraint.

it becomes more problematic for verbal gerunds. It is possible that regularity in verbal gerunds is derived independently of regularity of nominal gerunds, but that seems less plausible to me.

In the next section, we see how the analysis can explain the seemingly unrelated fact that nominal gerunds can occur with results and particles while derived nominals cannot.

## 6. Head Movement and the Particle-Nominalization Generalization

Nominal gerunds and derived nominals externally exhibit major distinctions in the types of events permitted (see: Pesetsky 1995, Marantz 1997a, Harley and Noyer 2000, Alexiadou, Sichel (2010), Alexiadou, Iordăchioaia and Soare 2010). Sichel (2010) notes that derived nominals only allow simple events while nominal gerunds allow for a more robust set of event types (for example, resultatives). This pattern can be seen in the following (modified<sup>20</sup>) examples.

(36) \*John's explanation (away) of the problem (away)

(37) John's explaining (away) of the problem \*(away)

(38) The running thin of the pavement

(39) The barking awake of the neighbors

Sichel argues that the differences are due to the available event-structure in the two constructions. If the differences are due to event-structure differences, then the constructions with the more complex events must have more complex syntactic structures (following Borer 2005, Ramchand 2007). Nominal gerunds are capable of hosting larger, more complex, events in contrast with derived nominals, which are not:

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<sup>20</sup> In Sichel's work, the result does not intervene between the noun and the object. The judgments are reported as:

(i) the running of the pavement thin

(ii) the barking of the neighbors awake

However, I've found strong preference for the examples given in the body.

“English derived nominals are restricted to single, simple, events, while ING-OF gerunds can also host complex events, in particular, lexical causatives and augmented events of various types” (Sichel, 2010: 160-161).

However, there are reasons to believe that whatever is restricting the presence of particles or results in derived nominals, it is not event structure related. Incorporated particles are found in derived nominals in German:

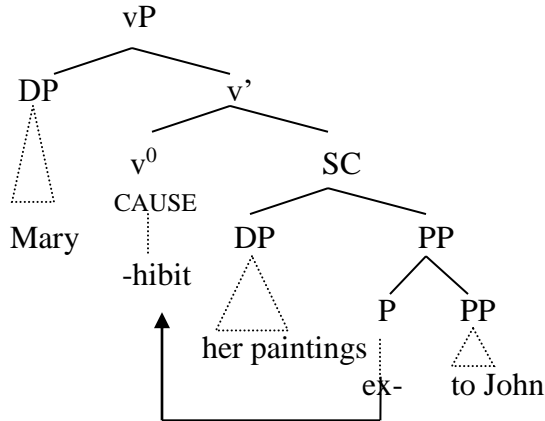
- |      |                             |                          |
|------|-----------------------------|--------------------------|
| (40) | <i><b>auf-nehm-en</b></i> ~ | <i><b>Auf-nahm-e</b></i> |
|      | up-take-V                   | up-take-N                |
|      | record                      | recording                |

((40) modified from Zeller 1997)

Following Harley (2008), English may exhibit identical behavior to German with respect to particle incorporation in derived nominals in most Latinate verbs. Harley analyzed the prefixes in Latinate verbs as particles that undergo mandatory incorporation. This analysis was based on co-occurrence restrictions on Latinate verbs with dative shift (due to the lack of P<sub>HAVE</sub>), other particles, and result states. These constructions are disallowed because the position the P<sub>HAVE</sub>, particle, or result would occupy is already occupied by the prefix.

- (41) dispose (\*up) – disposal
- (42) incise (\*off) – incision
- (43) complete (\*up) – completion

(44) Harley's Latinate Verb Structure



In Harley's analysis the prefixes *dis-*, *iN-* and *coN-* are all particles with morphological requirements inducing mandatory incorporation. If we adopt this analysis, then English Latinate verbs appear to behave exactly like German in derived nominal contexts.

However, the observation that particles are generally disallowed in English derived nominal contexts remains true<sup>21</sup>. Particles are permitted in nominal gerunds, but not in derived nominals:

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<sup>21</sup> A reviewer notes that examples like (40) through (43) may not pose a significant challenge to Sichel's analysis because they may not involve event complexity in the temporal sense. Sichel argues that the restriction on particles and restrictions on external arguments (Pesetsky 1995, Marantz 1997b, Harley and Noyer 2000, others) in derived nominals are tied to the lack of complex temporal events in the construction. The question is then whether the examples here are temporally complex.

However, without reconstructing Harley's (2008) analysis entirely, it is clear that the prefixal particles in examples (40) through (42) occupy the same structural position as the particles that are banned in derived nominals. Thus, for this analysis, the question of temporal complexity is somewhat irrelevant. There is a compelling reason to assume that the prefixes occupy the same position as the particles. A ban on event structure that targets some but not all particles (with the preserved particles having predictable morphological properties) would be quite puzzling.

- (45) marriage (\*off) of his daughters (\*off) – marrying (off) of his daughters (\*off)
- (46) explanation (\*away) of the issue (\*away) – explaining (away) of the issue (\*away)

We can note the following facts about particles in nominal contexts. First, it appears that particle incorporation is mandatory in nominal contexts. I do not have a ready explanation for this fact, but it is descriptively true (see Harley and Noyer 1998 and Harley 2009 for a potential explanation).

- (47) The repairman's continuous turning on of the lights [drove the electric bill way up this month]
- (48) \*The repairman's continuous turning of the lights on [drove the electric bill way up this month]

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This discussion is not meant to refute Sichel's overall analysis. Rather, the goal is to show that the presence or absence of particles in derived nominals cannot necessarily be tied to event size and can be more easily explained via morphological restrictions.

Sichel's claims about external argument restrictions are largely irrelevant to the overall discussion here. Sichel reports that indirect causes can be the subjects of nominal gerunds but not derived nominals. This distinction is illustrated below.

- i) The war's separation of the young couple...
- ii) The war's separating of the young couple...

Sichel reports (i) as ungrammatical and (ii) as improved. I do not share these judgments. While neither is ideal, I have a preference for (i). Other American English speaking linguists have confirmed this judgment. This suggests that there is not a clear division in acceptable external arguments between nominal gerunds and derived nominals.

We can also note that prefixal particles are permitted in both derived nominalization and in nominal gerunds (i.e. Latinates (41)- (43), while non-prefixal particles are only permitted in nominal gerunds, as in (45) and (46). This fact, coupled with the earlier analysis of (ir)regularity via head movement, is sufficient to explain this generalization.

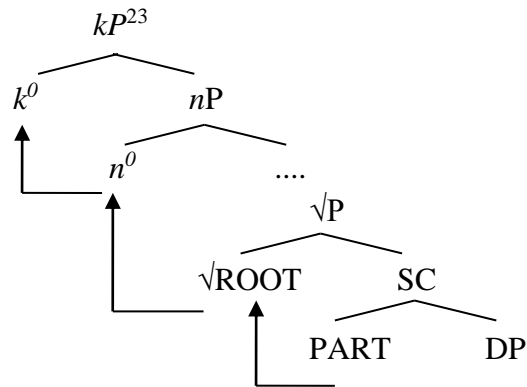
According to the Mirror Principle (Baker 1985), morphological ordering and syntactic ordering must match. This principle is a natural consequence of morphological and syntactic identity in a theory like DM. However, both derived nominals and nominal gerunds appear to violate this principle if we assume that the particle is incorporated. Particle incorporation happens before any movement to the nominalizing head, but the morphological ordering (predicted by left-adjunction) would be Root-nominalizer-particle.

What distinguishes derived nominals from nominal gerunds is the derivational step where the nominalizer and ROOT meet. Derived nominals have undergone obligatory head-movement forming a complex head of (at least<sup>22</sup>) [ $\sqrt{\text{ROOT} + \text{PART} + n^0 + k^0}$ ]. The derivation for such a structure is given below:

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<sup>22</sup> The presence or absence of a null  $v^0$  is irrelevant to this analysis.

(49) Derivation of a nominalized particle construction (take 1)



Under standard assumptions of head movement, namely Travis's (1984) Head Movement Constraint, head movement proceeds cyclically. A raising head cannot skip any intervening heads. Thus in the structure above, though the Root is moving into  $k^0$ , the Root must stop in  $n^0$  as it raises. Following Matushansky (2006), I assume that all instances of head movement necessarily entail morphological merger.

This account can explain why prefixal particles are permitted in derived nominals (German, English Latinates) but non-prefixal particles (non-Latinate English) are not permitted. When non-prefixal, the particle prevents the merger of the  $\sqrt{\text{ROOT}}$  and the  $n^0$ ; this is a direct consequence of the movement in the derivation in (49). The particle itself is not a legitimate attachment site for the nominalizer, so a legitimate morphological object cannot be created in this scenario.

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<sup>23</sup> I am assuming that the structure of particle incorporation is the same regardless of whether the particle appears before or after the root and that order is determined by the morphological properties of the given element at VI (this is in line with Harley 2008). However, prefixal particles may also be analyzed via left-adjunction (see den Dikken 1995). The particular analysis of prefixal particles adopted is irrelevant to the overall discussion. Regardless of how the particle prefixes, when it does, it doesn't block the nominalizer from attaching.



(50) \**marry-off-age* :: Root-part-nom

(51) \**marriage off* :: Root-nom-part

Prefixal particles do not interfere with the morphological merger of the ROOT and the  $n^0$ , so such constructions are predicted to be allowed. This result is borne out:

(52) *Auf-nahm-e* :: part-Root-nom

(53) *in-cis-ion* :: part-Root-nom

Unlike derived nominals, nominal gerunds do not have any restrictions on the types of particles that can occur with them. We might expect that particles in nominal gerunds should form the same illicit morphological structure—however, their acceptability is proof that they do not. The grammaticality of these constructions is a natural consequence of the Local Dislocation analysis offered as an explanation for the regularity of these forms.

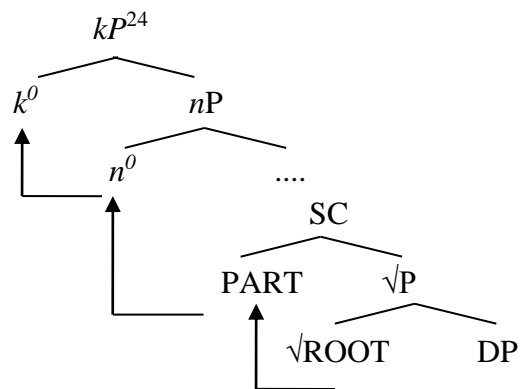
Unlike derived nominals, the nominalizer in nominal gerunds does not join the ROOT until after vocabulary insertion. Because Local Dislocation is primarily a morpho-phonological process and non-prefixal English particles are phonologically independent items (even when syntactically incorporated), the presence of an incorporated particle does not interfere with the morphological merger with respect to the nominalizer and the ROOT/stem.

It is critical to note that the ungrammaticality of examples like (50) and (51) is something of a morphological accident. If a particle is prefixal, it can co-occur with an idiosyncratic nominalizer. However, I haven't explored what determines when a particle will be prefixal or not.

Punske (2013) argues that the structural properties of the Latinate particles are different than (most) other English particles in that they are structurally higher and the particle selects for the

ROOT (not the other way around). This structural relationship explains why they are prefixes along with a battery of other properties.

(54) Derivation of a nominalized particle construction (take 2)



Thus, following Punske's (2013) analysis of Latinate particle constructions we have a relatively straightforward way to distinguish between particle constructions that can be derived nominals and those that cannot: if the particle selects and embeds the ROOT, then they may participate in derived nominalization. If the ROOT selects the particle, then they may not.

## 7. Conclusions

By adopting a modified Local Dislocation analysis of English gerunds, a number of diverse facts can be explained. First, the fact that gerunds are highly regular while derived nominals are not readily falls out of the different syntactic environments of these two constructions. Derived nominals have a higher  $kP$  that induces cyclic head movement. Because of this movement, the ROOT/stem and the  $n^0$  are part of a single complex head at Vocabulary Insertion. Under such an

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<sup>24</sup> I am assuming that the structure of particle incorporation is the same regardless of whether the particle appears before or after the root and that order is determined by the morphological properties of the given element at VI (this is in line with Harley 2008). However, prefixal particles may also be analyzed via left-adjunction (see den Dikken 1995). The particular analysis of prefixal particles adopted is irrelevant to the overall discussion. Regardless of how the particle prefixes, when it does, it doesn't block the nominalizer from attaching.

arrangement, idiosyncratic contextual allomorphy is possible. By contrast, gerund-affixes only attach to their hosts after Vocabulary Insertion. Under such conditions, only regular phonological processes can apply because the ultimate morphosyntactic context is invisible to the insertion process.

This creates two distinct ways of deriving regularity within a theory like DM. Construction-wide regularity (like that found in gerunds) occurs because morphological merger follows VI insertion and the processes that create irregular forms (Readjustment Rules or suppletion via fusion) cannot occur because the context is unavailable and/or fusion is impossible if head-incorporation has not occurred. Regularity in constructions with irregular forms (e.g., English tense) is derived through elsewhere processes standard to DM.

This analysis also captures the particle/result facts discussed in Sichel (2010). Sichel noted that derived nominals are unable to occur with particles or results while nominal gerunds can. Sichel argued that this was due to event-structure differences in the two constructions; however, that analysis is problematic since there are examples of particles in derived nominals (German, English Latinates). I showed how these effects could instead be tied to the same syntactic processes that derive the regularity facts in English nominalization. Since particles and results must incorporate in nominalization, the movement into  $n^0$  creates an illegitimate morphological object unless there is a mismatch in the position of affixation between the  $n^0$  and the particle/result (as seen in German and English Latinates). Because derived nominals involve movement into  $n^0$ , Sichel's generalization can be explained through the morphosyntax. In contrast, nominal gerunds do not involve overt movement so the availability of particles and results is expected.

The analysis also provides a neat division between head movement/Lowering and Local Dislocation. Local Dislocation is argued to be a process that only applies to terminals with interpretable features. This approach could yield significant results in the connections among regularity, interpretability and acquisition. If this account is on the right track we should predict to find significant overlap between interpretability and regularity throughout the world's languages. Though it is important to recall that regularity is not a precondition on interpretability; contextual allomorphy is possible for a fully interpretable item if a higher head with uninterpretable features triggers cyclic movement through the interpretable head. Such is the case of  $n^0$  in derived nominals.

The analysis offered here still maintains the fundamental insight of Embick (2010) that (ir)regularity is a property of syntactic locality. Unlike Embick, this distinction is created through movement rather than through the presence or absence of cyclic heads. This analysis is not meant as a rebuttal to Embick's program; the idea that cyclic heads play a role in determining morphological regularity is well supported in other areas. Critically, whatever that role is, movement must also be involved in a fundamental way.

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