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## Argument Structure and Derived Nominals

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## Abstract

A review of the analytic history of derived nominals and their argument structure configurations spans, by necessity, significant milestones in theoretical developments at the very least of the past 50 years, with crucial issues involving most crucially on the one hand the lexicon/syntax divide and the formal properties of words and word formation, and on the other hand the modelling of event structure. Major theoretical developments in the past 50 years are summarized and critically assessed in this chapter.

**Keywords:** *Action Nominals, Argument Structure Nominals, Complex Event Nominals, Derived Nominals, The Lexicon and Lexical Word Formation, Listedness, Nominal Affixation, Non-compositionality, Process Nominals, Remarks on Nominalizations, R-nominals, Simple Event Nominals, Syntactic Word Formation, X'-theory.*

## 1 Introduction

This chapter reviews analytical approaches to the morphology and the syntax of deverbal *derived nominals* (DNs), a term used here to refer to phonological words with a nominal distribution, which may nonetheless exhibit some syntactic properties mirroring those of verbs to which they are morphologically related.<sup>1</sup> More specifically, we will look at accounts for the correlation between DNs and event structure and the realization of event arguments. Some important properties are illustrated in (1):

1. Nominal distribution:
  - a. An *invention*/the *invention*/a wonderful *invention*/many *inventions*
  - b. The third *exclusion* changed our lives
  - c. With sensible *staffing* in place, we were ready to move to *production*

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<sup>1</sup> This convoluted initial description is made almost inevitable by the long, complex analytic history of the construction and the multiple theoretical approaches to it. See fn. 2 as well as Glossary for terminology.

2. Verbal properties
  - a. The *invention* of the cotton gin by Eli Whitney changed American history
  - b. The supreme court's deliberate *exclusion* of expert testimony skewed the outcome
  - c. The *restaffing* of the organisational roles to maximize expertise
3. Verbal correlates:
  - a. Eli Whitney invented the cotton gin/the cotton gin was invented by Eli Whitney
  - b. The supreme court deliberately excluded expert testimony/expert testimony was deliberately excluded by the court
  - c. The manager restaffed the organizational roles/the organizational roles were staffed by the manager to maximize expertise

The preliminary, and incomplete, set of 'mixed' properties in (1)-(2) defines a puzzle that has always intrigued grammarians and whose investigations have had multiple important theoretical consequences for theories of syntax and morphology. At the core of the multiple analyses of the paradigm there rest the following fundamental questions:

- A. Is the relationship between the verbal cases in (3) and the corresponding nominalizations in (1)-(2) *derivational* in nature?
- B. If the answer to (A) is *no*, how is that relationship to be captured, if at all?
- C. If the answer to (A) is *yes*, how can the *derivational* relatedness be captured?

As depending on the answer to (C), question (D) becomes pertinent as well:

- D. What does the term 'nominalization' cover, beyond the cases in (1)-(2)?

Relative to D, the question is, are we looking for a derivational relationship that could, in principle, also account for the emergence of (verbal) gerund, as in (4a)? Agentive nominal, as in (4b)? Complex NP complements, as in (4c)? Relative clauses (unreduced and reduced) as in (4d,e)? Is the relationship that holds between an adjectival stem and a corresponding nominal, as in (5), to be modelled along similar lines to that which holds between deverbal DNs and the correlating verb?<sup>2</sup>

<sup>2</sup> Terminological confusion is rampant relative to at least some of the constructions under discussion here, not only with distinct labels for identical configurations, but also with the same terms used to name different ones. In this chapter, I will use the following terminology, throughout:

<b>Gerund</b>		<i>Mary staffing the roles successfully; Bill's eating the pie quickly</i>
<b>Derived Nominal (DN)</b>	DN-ing	<i>Mary's successful staffing of the roles; Bill's quick eating of the pie; the eating of the pie; the staffing of the roles by Mary</i>
	DN- <i>atk</i> *	<i>Laura's inclusion of the staff; the deferral of the decision (by Julian); the management of the crisis by Frank</i>

\**Atk* = *ation* and *kin*, for the class of Latinate deverbal nominalizing affixes in English which includes, at the very least, *-ation*, *-al*, *-ment*, *-ence/ance* and possibly others, but exclude *-ing*. More terminology will be introduced when appropriate. See glossary for the full terminological list.

4. a. (Her) staffing the lead roles was a success  
     b. The staffer (of the lead roles) was Laura  
     c. I believe the rumour that Laura staffed the roles  
     d. The policewoman who staffed the roles  
     e. The roles staffed by the policewoman
5. a. Newsmax is close to Trump  
     b. Newsmax's closeness to Trump is now a liability

The relationship between the answer given to (C) and the appropriate extension of the term 'nominalization' is directly dependent on what we consider to be the appropriate input to 'nominalization'. To illustrate, if the derivational source for nominalized phrases is fundamentally a *sentential* structure, the claim most notably first made in Lees (1960), (4c,d,e) as well as (5b) could and possibly should be subsumed under it. If, however, the derivational relationship is not phrasal, but is to be stated on the level of terminals, regulating, e.g., the relationship between *include* and *inclusion*, or *staff* and *staffing*, an explanation for the emergence of a nominal constituent in (4c,d,e) as well as possibly (5b) would not necessarily be subsumed under it. In the history of theorizing about DN, both types of answers have been given, as well as a host of 'intermediate' solutions which associate various nominal structures with derivational sources ranging in complexity from  $V^{\min}/A^{\min}$  ( $V^0/A^0$ ), or even uncategorized stem/root, to any projection within the verbal/adjectival functional spine. For reasons of space, however, we are prevented from doing full justice to all these accounts, and this chapter restricts itself, specifically, to deverbal DNs. Given the focus on the distribution of argumental roles within deverbal nominals, and given the different event properties of psych predicates, nominals with corresponding psych predicates are left outside of this review as well. For a recent review of issues related to the scope of the term DN, see, in particular, Alexiadou (2020). For influential work on de-adjectival DNs see, in particular, Roy (2010). For extensive discussion of psych nominalizations, see, in particular, Rozwadowska (1989, 1997, 2020, i.a.) as well as the reviews in Rozwadowska (2006, 2017). Finally, while DNs have now been investigated in a broad range of languages, a full review of this typological breadth is not possible for reasons of space, and as a consequence, we focus here primarily (although not exclusively) on English DNs, which have been the most extensively studied, and which continues to serve as the theoretical starting point for all subsequent theoretical proposals.<sup>3</sup>

The organization of this chapter is as follows. In section 2 I review Chomsky (1970) *Remarks on Nominalizations* (RoN), which sets the stage for all subsequent discussions of DNs, and in particular, to an analytical approach that distinguishes gerunds (and

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A second terminological confusion concerns the fact that the term *derived nominal* has been used interchangeably for both a phrasal nominal configuration including both the terminal nominal, and its arguments or modifiers, and the terminal itself, i.e., the morphological formations *invention* or *staffing*. Where reference is not otherwise self-evident, the term DN-terminal is used for the morpho-phonological nominal word.

<sup>3</sup> The reader is referred to Rozwadowska (2006, 2017) for a highly informative review of the analytic history of DNs across their instantiations. For some recent cross-linguistic investigations, see in particular, articles in Alexiadou and Rathert (2010), and Alexiadou and Borer (2020).

presumably relative clauses and complex nominals) from DNs. Accepting, fundamentally, Chomsky's conclusion that gerunds are syntactically derived from a (subset) of the propositional structure, subsequent sections focus on two fundamental claims in RoN. The first is the claim that DNs are neither syntactically nor otherwise derivationally related to the correlating verb. The second is the realization of DNs in the context of arguments. Section 3 starts with a brief review of the two decades of post-RoN work on DNs from both morphological and syntactic perspective, and then turns to Grimshaw (1990) and the emergence, within the study of DNs, of the distinction between DNs which come with event interpretation and argument structure, and those that do not. Section 4 is devoted to evaluating the lexical/syntactic divide in the analytical history of DNs, and section 5 turns to the host of syntactic approaches to DNs which have emerged in the past 25 years, with a particular focus on argument taking eventive nominals (AS-nominals). DNs lacking arguments (R-nominals) are discussed in section 6.<sup>4</sup> Section 7 concludes with highlighting several outstanding questions which, in the view of this author, must be resolved before further significant analytic progress can be made on the structure of DNs, and more generally, the attempt to model complex words as syntactically complex constituents.

## 2 Chomsky (1970): Remarks on Nominalizations

### 2.1 DNs are not syntactic.

In 1967 (published 1970), in a move that was as controversial as it was influential, Chomsky proposed that certain operations of word formation and in particular derived nominals, erstwhile presumed to be within the jurisdiction of the syntax, are to be moved to the lexicon, an explicitly non-generative component of the grammar. Within the lexicon, their properties were assumed to be on a par with other listed properties such as subcategorization, selectional restrictions, category specification, and phonological properties (cf. Chomsky, 1965). The primary rationale for moving the relationship which holds, e.g., between *defer* and *deferral* to the lexicon was twofold. On the one hand, it was methodological. Attempts to constrain the syntactic derivations of deverbal nominals and of complex words in general proved extremely tricky, and as such, their continued syntactic investigation was detrimental to attempts to formally constrain the syntax along more universal lines. Moving complex word properties to the lexicon therefore allowed the development of a more constrained syntax for those sub-areas of grammar for which progress could be most beneficially made at the time (primarily non-local dependencies).

The second rationale for moving complex-word internal properties to the lexicon was formal. Chomsky (1970) puts forth a series of arguments designed to show that the formation of complex words, however achieved, is not a generative device, but rather, must avail itself of lexically listed item-specific information. In turn, moving complex

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<sup>4</sup> The configurations I label here as AS-nominals have been otherwise referred to as *Process Nominals*; *Action Nominals*; and *Complex Event Nominals* (the latter from Grimshaw, 1990, see section 3 for some discussion). The configurations I label as R-nominals have been otherwise referred to as *Result Nominals* and *Referential Nominals*.

words to the lexicon extended the latter's role. Alongside being the locus for item-specific unpredictable information, as specified in Chomsky (1965), it has become as well the locus for the statement of relationship between related words, by assumption potentially unpredictable.

Reasoning on the basis of a detailed comparison between DNs and gerunds, Chomsky constructs a typology of syntactic vs. lexical operations.<sup>5</sup> Central to his reasoning is the observation that while gerunds are entirely regular and predictably share the properties of the verbal sentential structures from which they are derived, that is not the case for DNs, where phonological, interpretational and syntactic idiosyncrasies are common.

It is important to stress in the context of present-day perspectives, that at least some of the objections to a syntactic derivational account of DNs were fundamentally anchored in the claim that the source is sentential, and that an identical source, for all intents and purposes, is the input to the formation of both gerunds and DNs. For gerunds, Chomsky postulated the likely sentential source as (6) and for the purpose of the comparison with DNs, this representation, or a minimally distinct one, was to serve as a putative source for DN as well. Insofar as (6) or a minimal variant of it can give rise to a successful transformational account for the properties of gerunds, but fails to account for the properties of DNs, the conclusion must be, Chomsky argues, that DNs are not transformationally derived:<sup>6</sup>

6. [s NP NOM (Aspect) VP] (p. 187)

Most present-day derivational accounts of DNs, including syntactic ones, allow, however, for their derivational source to be considerably smaller than a sentence, and may, in fact, be no bigger than  $V^{\min/\max}$ , or even a bare *root*, in turn embedded under some nominal projection headed by NOM, where 'NOM' here is in reference to a nominal categorial head regardless of realization. As a consequence, at least some of the objections raised in Chomsky (1970) to a syntactic derivation of DNs vanish, or, quite frequently, amount to the statement of a puzzle which no longer can be solved by relegating DNs to the lexicon.

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<sup>5</sup> Chomsky's own terms are *nominal gerunds* (*gerunds*, here), *mixed nominals* for DN-*ing* and *derived nominals* for DN-*atk*.

<sup>6</sup> In (6), NOM is a morphological N-marker, realized as *-ing* in gerunds. A corresponding marker in DNs would be *-ation* or *-ment* (or, indeed, *-ing*). The systematic realization of NOM as *-ing* in gerunds, vs. its item-specific realization in DNs is one of the arguments Chomsky provides to exclude DNs from the syntax.

This notwithstanding, some epistemological comments are in order. By assumption, for the period, any derivational operation is by definition a *transformation*, and *transformations*, by definition, operate on syntactic strings. Hence *derivational* → *Syntax*. To the extent that schools of Word Formation have emerged within generative grammar in the 1970s and 1980s which postulated a derivational theory of word formation that is *NOT* syntactic, such schools eschewed the claim that *derivational* → *Syntax*. On the other hand, to the extent that many present-day *constructivist* accounts argue for a unified computational component giving rise to both word-internal and word-external complexity, these, ironically enough, return to the fundamental claim in RoN, according to which Syntax is the only *derivational* component in the grammar.

Table 7 summarizes the main differences highlighted by Chomsky between gerunds and DNs. Some relevant exemplification is in (8-17).<sup>7</sup>

7.	<i>Gerunds</i>	<i>DNs</i>	<i>Ex</i>
Saxon Genitive ('s)	Y	Y	
Definite article	N	Y	
Adjectival modification	N	Y	(9a-b)
Adverbial modification	Y	N	(9a-b)
Obligatory subject, obligatory complement (where subcategorized)	Y	N	(8)
Accusative Case	Y	N	
<i>Of</i> -case for complements	N	Y	
Auxiliaries, grammatical aspect	Y	N	
Dative shift, Particle shift	Y	N	(10-13)
Exceptional Case Marking (so called)	Y	N	(15a-c)
'Tough'; subject raising	Y	N	(16-17)
NOM selection predictable	Y	N	(18)
Stem phonology predictable	Y	N	(19)
Compositional Content	Y	N	(20)
8. * (the pilots) having destroyed/destroying brutally			
9. a. The (brutal) destruction (*brutally) was complete; the (yearly) examination is ongoing			
b. The (brutal) destruction *(of) Gaza (*suddenly); the (frequent) examination of the students (*frequently)			
10. a.	her looking up the report	Gerund	
b.	her looking the report up		
11. a.	her looking up <i>of</i> the report	DN	
b.	*her looking <i>of</i> the report up		
12. a.	her giving birthday presents to the children	Gerund	
b.	her giving the children birthday presents		
13. a.	her giving/gift <i>of</i> birthday presents to the children	DN	
b.	*her giving/gift ( <i>of</i> ) the children ( <i>of</i> ) birthday presents		

<sup>7</sup> The absence of adjectives and articles for gerunds is straightforward, if they are derived from a sentential source. It is, however, puzzling if, as Abney (1987) suggests and as is almost universally endorsed, gerunds are headed by a DP.

For various accounts for some of the contrasts in (7) within syntactic executions see, i.a. Alexiadou (2001), Harley (2009b), and Borer (2013b), i.a..



14. a. our believing in god Gerund  
 b. our believing/considering Meg to be a genius
15. a. our belief in God; our consideration of Meg for the job DN  
 b. \*our belief/believing of Meg to be a genius  
 c. \*our considering/consideration of Meg to be a genius
16. a. Kim's being easy to please Gerund  
 b. Jo's being certain/likely to win
17. a. \*Kim's easiness to please (and compare with *Kim's eagerness to please*)  
 b. \*Jo's certainty to win (and compare with *Jo's certainty that she will win*)
18. *construction*, \**constructal*, \**constructment*  
 \**governat*ion, \**governal*, *government* *governance*  
 \**arrivat*ion; *arrival* \**arrivem*ent  
 \**provat*ion *proval* \**provem*ent *proof*
19. *destroy* → *destruct*(ion); *prove* → *proof*; *liquify* → *liquef*(action)
20. *proofs* (TEST COPY); *transmission* (GEARBOX); *government* (STATE LEADERSHIP)

In the subsequent sections I will return to some of these diagnostics, addressing the way in which they may be handled if one is to integrate DNs back into the syntax. A complete review of available reanalyses of the contrasts in (7) is not attempted, but as an illustration of relevant factors, consider the contrasts in (10-11), showing that English particle shift is licit in gerunds, but not in DNs. The contrasts under consideration here are not item specific but general, and involve, Chomsky suggests, a distinction between the properties of nominal phrases and properties of sentential phrases (or verbal ones).<sup>8</sup> But in actuality, the contrast does not provide an argument against a derivational account for DNs, but rather, it constitutes an argument against deriving DNs from the structure in (6), or more concretely, from a structure in which NOM scopes over a VP structure that is identical in all respects to that embedded (say) under T. Specifically, if one assumes (e.g., as in Johnson, 1991 and much following literature) that particle shift in propositional contexts has the broad structures in (21a-b), and if indeed verbal spines can be embedded, as such, under NOM, the ungrammaticality of (22b), when contrasted with the licit (21b) is inexplicable:<sup>9</sup>

21. a. her [<sub>FV1</sub>look [<sub>FV2</sub> [<sub>FV3</sub> <look> [<sub>PrtP</sub> up [<sub>DP</sub> the report]]]]]....  
 b. her [<sub>FV1</sub>look [<sub>FV2</sub> the report [<sub>FV3</sub> <look> [<sub>PrtP</sub> up [<sub>DP</sub> <the report>]]]]]
22. a. NOM-*ing* [<sub>FV1</sub>look [<sub>FV2</sub> [<sub>FV3</sub> <look> [<sub>PrtP</sub> up [<sub>DP</sub> the report]]]]]....  
 b. \*NOM-*ing* [<sub>FV1</sub>look [<sub>FV2</sub> the report [<sub>FV3</sub> <look> [<sub>PrtP</sub> up [<sub>DP</sub> <the report>]]]]]

<sup>8</sup>RoN makes no attempt to explain the distinct properties of N and V, such that the relevant contrasts are explained, rather than asserted. This is particularly noteworthy against the claim, also in RoN, of identical complementation structure across categories, as per the X'-scheme. For an attempt to reduce the distinction to *proper government*, another category-specific property, see Kayne (1984).

<sup>9</sup> FN<sub>i</sub> or FV<sub>i</sub> for ordered functional nodes in the verbal or nominal spine. The original position of moved elements is notated as copies in angled brackets. No particular theoretical commitment should be read into these notations.



The structures in (22), however, represent only one of several possible representations of the verbal spine embedded under NOM, especially if we assume, as most present-day syntactic derivations of DNs would have it, that a *partial* verbal spine can and possibly must be embedded under NOM in DN structures. For example, in addressing specifically the contrasts illustrated in (10-11), Harley and Noyer (1997) as well as Harley (2009c) propose that the verbal spine embedded under NOM lacks (their equivalent of) FV2 (see references for the detailed execution), and that the shifted variant in (22b) is directly excluded as a consequence.

Another route for explaining the contrast would exploit the role and function of various instances of NOM (as categorial N/*n* function). For instance, in Borer (2013b), the absence of particle shift in DNs is explained by the semantic clash between the inherent atelicity induced by NOM-*ing* (see also discussion in 3.3.3 below), and the telic function of *up* in shifted configurations, but not otherwise, as evidenced by the contrast between (23) and (24):<sup>10</sup>

- 23. a. She wrote up letters for years demanding that regulations be changed
- b. Think of all the times you left your cell phone charger plugged into the wall and it just ate up energy for hours
- 24. a. ??She wrote (many) letters up for years demanding that regulations be changed
- b. ??...and it just ate (too much) energy up for hours

The brief illustrations above point to at least two ways in which the contrasts in (7) could be explained: the first appeals to partial verbal spines embedded under NOM, otherwise assumed in multiple accounts of DN. The second banks on specific properties of NOM, again, a common claim in DN analyses.

An altogether different matter concerns the accuracy and the generality of the contrasts in (7). Thus Sichel (2007) shows that the English picture is considerably more nuanced, with grammatical raising cases such as those in (25a), and illustrates the availability of similar cases are attested in Hebrew, as in (25b). Fu, Roeper and Borer (2001) highlight the grammaticality of low adverbs in DN (26a), when contrasted with high adverbs, such as (26a):

- 25. a. Nixon's likelihood of winning
- b. ha-sikuyim šel Rina [<Rina> le-hagi'a ba-zman]  
          the-chances of Rina to-arrive on-time  
          'Rina's chances to arrive on time' Sichel (2007)

---

<sup>10</sup> Particles are altogether excluded in DN-*atk*, indicating, yet again, that verbal spines embedded under NOM are not identical to those embedded under T:

- i. \*the addition up of the numbers
- \*the payment up of debts
- ii. \*the addition of the numbers up
- \*The payment of debts up

26. The removal/shredding of the documents (so) quickly/efficiently/clandestinely  
 \*the removal/shredding of the documents definitely/supposedly/possibly

While the judgements in (26) are not universally endorsed note that there are no such judgement variability concerning the fully licit case in (27a), although *twice* (and similar) is very clearly an adverb otherwise only licit in verbal contexts, as the ungrammatical cases in (27b). illustrate:

27. a. the bombing of the city *twice*  
 b. \*the wedding/jump/trip *twice*

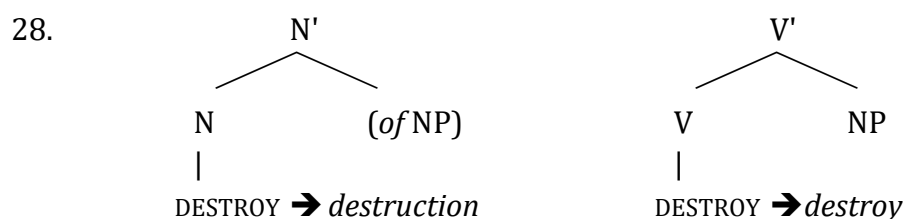
Finally, at least in Hebrew, in structures that otherwise adhere to Grimshaw's diagnostics for ASN, objective case is licit, a matter I note and exemplify in section 5.2.

## 2.2 Category Neutral Lexicon

Having argued for a non-syntactic, lexical account for DNs, Chomsky (1970) does observe that alongside potential idiosyncrasies or syntactic differences between gerundive and DNs instantiations, DNs are frequently systematically related to their verbal correlates both in terms of their lexical meaning (henceforth Content), and in terms of the argument array potentially associated with them, to wit, *destroy* and *destruction*, *defer* and *deferral* and so on. These correlations, however, are not to be captured through a transformational, derivational treatment. Rather, they are to be captured by a generalized phrase structure scheme: X' theory. Within that scheme, a pair such as *destroy/destruction* can be specified to share properties through the existence of a single entry, call it DESTROY, which is category neutral, but which has a fixed, constant subcategorization frame, consisting in this specific case of a direct nominal complement. The category-neutral item DESTROY may now be inserted under X<sup>0</sup>, be it N<sup>0</sup> or V<sup>0</sup> within a structure which is already categorially labelled by the PSR. Thus DESTROY, if inserted under N, would be (effectively) a noun, and would be pronounced *destruction*. If, on the other hand, it is inserted under V it would be (effectively) a verb and would be pronounced *destroy*.<sup>11</sup> Given the provisions of the X'-scheme, subcategorization relations which hold between an entry and its complement are expected to be constant across categorical instantiations, giving rise to the scheme in (28):<sup>12</sup>

<sup>11</sup> For a strict Bare Phrase Structure approach, note, this execution is impossible, as, in principle, an inserted terminal projects its inherent categorial properties, if any, and is not *inserted* into a pre-constructed labelled categorial node. Within constructivist approaches, however, this particular interpretation of BPS has been largely set aside and category-less roots may undergo external merge, with categorial properties otherwise emerging.

<sup>12</sup> The suggestion that specifiers are cross categorially subjects (originally in Stowell, 1981, 1982) postdates the original circulation of RoN by some 14 years. For the role of specifiers in earlier versions of X'-theory see primarily Emonds (1976) and Jackendoff (1977).



Several crucial properties of (28) are worth highlighting. First, note that the complement of the noun is optional, but that of the verb is obligatory. Chomsky (op. cit.) assumes, explicitly, that this is a structural difference between nouns and verbs which spans both the object and the subject, the latter optional for nouns and obligatory for verbs as well. In fact, the optionality of complements in DNs vs. their obligatoriness in gerunds serves for Chomsky as an argument for the lexical rather than (syntactically-) derived nature of deverbal nominals. To wit, if deverbal nominals are derived from sentences, one expects the obligatoriness of both complement and subject, typical of verbal constituents, and attested in gerunds. That such obligatoriness is not found in DNs therefore serves as an argument that fundamentally, they are inserted into the tree as nouns to begin with and are hence not syntactically derived.<sup>13</sup>

A second important observation concerning the structure in (28) is that syntactically, *destroy*, a verbal head, and *destruction*, a nominal head, are equally complex – both are terminals. That one of them is morphologically more complex and includes within it a stem that is largely phonologically identical to the verbal realization is most certainly not a syntactic fact, and for Chomsky (1970), it is not clear that it reflects any systematic relationship altogether, as opposed to constituting a salient statistical correlation, an approach explicitly put forth by Jackendoff (1975).

Finally, note that albeit not explicitly highlighted, the entry for DESTROY must contain *some* phonological information which is shared between *destroy* and *destruction*. Were that not the case, the phonological overlap between *destruction* and *destroy* and similar pairs would become an inexplicable – and repeated – coincidence, and few of the arguments in RoN comparing the behaviour of verbal and nominal items would make any a-priori sense.

### 2.3 RoN: a Retrospective Evaluation

There resides, within the RoN agenda, an uneasy tension between the particular and the general. On the particular side, we have the unpredictable properties of DNs, consisting primarily of phonological, morphological, and Content item-specific properties. On the general side, we have properties which DNs share with some verbal correlate, and which, by assumption, are realized differently in verbal and nominal contexts. An illustration of this tension is available when we consider the triplet in (29):

29. transmit	transmission	transmission
TRANSMIT	ACT OF TRANSMIT	GEARBOX

<sup>13</sup> The absence of subjects in DN when contrasted with gerunds can only be neutrally illustrated with DNs that lack both subject *and* object, as in (1a). In other contexts, the ostensibly missing subject, in both gerunds and DN, could be PRO/*pro*, according to some. I return to this issue in section 5.2.

Although the decision to relegate DNs to the lexicon rests heavily on the idiosyncratic properties of *transmission*[GEARBOX], it is not in actuality clear how to handle this idiosyncrasy within the RoN approach. Specifically, if all three instantiations in (29) are realizations of a single category-neutral entry TRANSMIT, the system would run afoul of the claim that all occurrences of TRANSMIT share a subcategorization frame (albeit with a category-specific instantiation), because in the context of *transmission*[GEARBOX] arguments are not optional, they are impossible. If, on the other hand, one is to sever *transmission*[GEARBOX] from the entry of TRANSMIT (e.g., by claiming that its Content has drifted sufficiently to warrant the introduction of a new independent entry), Content unpredictability could no longer serve as an argument for the lexical treatment of DNs, allowing straightforwardly for the syntactic relatedness, indeed derivational relationship, between the two putative variants of TRANSMIT, and with *transmission*[GEARBOX] being relegated to the role of irrelevant homophony.

A more general problem for the RoN approach is the systematic emergence of triplets such as those in (30), all with shared core Content, but with systematically distinct syntactic diagnostics for the activity DNs and the result/object/state DNs:

30.		<b>DN: Action</b>	<b>DN: Result/state/object</b>
	refer	referral	referral
	examine	examination	examination (=exam)
	assignment	assignment	assignment
	attend	attendance	attendance
	destroy	destruction	destruction (state of)
	beat	beating	beating

While the DN-Action instantiations share the arguments of the verb (and specifically obligatory complements), the DN-result/object/state instantiations do not. However, mere optionality fails to capture the fact that the action instantiations *must* refer to an event of some sort, but no such event reference is necessary for the result-object-state instantiations.<sup>14</sup> *Referral*, *examination* and *assignment* may all refer to documents, *attendance* may be in reference to an audience and finally both *destruction* and *beating* may refer to a state resulting from an action but need not reference an action or an event directly. In some of these cases, idiosyncratic information might be needed, e.g., the specific use of *assignment* in the context of a course of study, but that Content exists side by side with *assignment* which is generally synonymous with TASK, and which means little beyond ‘that which was assigned’. What is true here across the board, is that for any category-neutral entry, there are, with virtually no exception, and as it turns out quite prevalently cross linguistically, two nominal instantiations. One which preserves the complements of the entry (say REFER), and which per force refers to a nominal instantiation of the same activity as the verbal instantiation, and one which does not preserve the complements, and which may (or may not) be associated with idiosyncratic information. If we treat all these DNs as instantiations of REFER, then clearly the statement of the properties of lexical entries as reflected through the scheme

<sup>14</sup> Event reading, as such, is not excluded for DNs without argument structure, giving rise to what Grimshaw labels ‘simple event’ nominals. I return to this matter in section 3.3.

in (28) is insufficient. The other option, of course, is to treat all non-activity DNs as instances of drifted, separate lexical entries. As already discussed for *transmission*[GEARBOX], however, that summarily does away with the idiosyncratic-meaning argument for a lexical treatment of DNs. More broadly, exiling *assignment*[TASK, HOMEWORK] or *beating*[DEFEAT] from the lexical entry of ASSIGN and BEAT respectively looks, very much, like the wrong theoretical move.

What is at stake here is the syntactic implication of Content idiosyncrasy. The principle that guided the RoN agenda as well as lexicalist approaches that have emerged in its wake, was that generalizations that apply selectively are not syntactic in nature. The consequence, starting with Bresnan (1982a,b), and continuing within both LFG and GB, is the emergence of a rich array of operations designed to affect entry-specific properties, therefore allowing for selective targeting. To illustrate from dative shift, the fact that *give* allows dative shift, but its close synonym *donate* does not, translates into the need to postulate an operation that would allow the permutation of *theme* and *goal*, and which could operate, specifically, on the lexical entry of *give*, but could not operate on the lexical entry of *donate*.

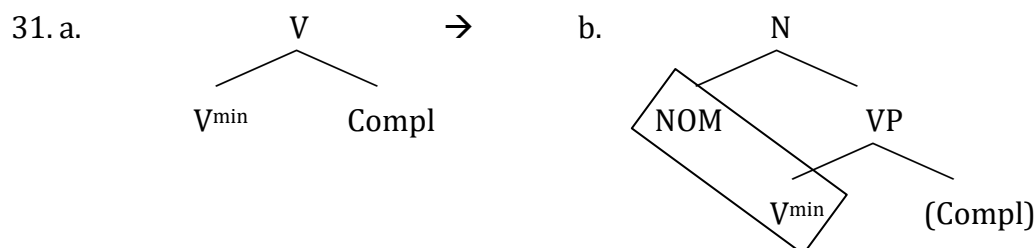
As it turns out, however, the lexicalist logic here only follows if intrinsically linked to a very specific set of assumptions on lexical insertion and structure building which are by no means necessary, and which all too frequently are not made explicit. To see this, suppose we conduct a thought experiment in which all traits typically associated with the lexical entry as assumed in the 70's and 80's remain constant, *including* the information that the entry of *give*, but not *donate*, is specified to allow a permuted *goal-theme* configuration, however accomplished. Our thought experiment changes but one facet of the common lexicalist approaches, in postulating *the late, post-syntactic insertion of lexical entries* into syntactic configurations. It is now clear that in our experimental model, there is absolutely no reason to postulate a non-syntactic, *lexical* operation that brings about the permutation of the *theme* and the *goal*. Rather, we can proceed to achieve that permutation through some movement operation, however executed. The burden of specifying that this syntactic operation is licit in the context of *give*, but not in the context of *donate* would now become neither a syntactic restriction, nor an operation on entry-internal argumental representations, but rather a well-formedness condition on the *contextual insertion* of *give* vs. *donate*, with the former allowing insertion in the context of *goal>theme*, but the latter barring it. To highlight the matter, note that in this hypothetical execution, the information associated with *give* or *donate* is not any richer from the information that would be associated with these entries in a 'lexicalist' model. In a classical lexicon, *give*, but not *donate* would effectively allow for two alternating subcategorizations. In our late-insertion thought experiment, that information would be effectively converted to the respective post-syntactic insertion frames for *give* and *donate* (alternatively, to a set of realization conditions as associated with particular verbs or roots).

Lexicalist treatments, then, do not follow from selective targeting. Rather, lexicalist treatments follow from the crucial assumption, originally in Chomsky (1965), that lexical entries are fragments of syntax which are the fundamental building blocks of D-structure. Once this assumption is dispensed with, the item-specific rationale for

lexicalist mapping operations vanishes, *even* when lexical entries are allowed to retain syntactic information, let alone if they are not.<sup>15</sup>

A similar logic follows for the relationship between selective phonological operations and lexicalist treatments, where, likewise, late insertion does away with the lexicalist reasoning. See Halle and Marantz (1993) and much subsequent discussion.<sup>16</sup>

With the conclusions of this short detour in mind, let us return to DNs, and to the triplets in (29) and (30), to note that late *Content* insertion would allow even the most idiosyncratic of DNs to be syntactically derived. Conducting yet another thought experiment, suppose DNs indeed derive from some portion of the verbal spine, as already briefly suggested in section 2.1. Schematically, then, as in (31):



In (31b), an expanded syntactic tree gives rise to a nominal projection above a verbal one, and an additional operation, possibly head movement, combines V with NOM, yielding a single complex constituent. Syntactically, there is nothing to distinguish this operation from standardly licit syntactic operations which may involve head movement, with or without head adjunction. The combined form may, in turn, exhibit unpredictable phonological realization properties (e.g., *proof*), but that fact need not be stated as part of the syntax, nor impact it, if phonological insertion is indeed late. The boxed constituent could, as well, give rise to Content that is not predictable from its parts, e.g., *transmission*[GEARBOX] or, indeed, *proofs*[TEST COPY]. That, too, is not a syntactic fact, but would be driven by late Content insertion to which the boxed constituent in (31b) is the input. Finally, and taking a page from the discussion of *give* and *donate*, we can now state that both *transmission*[GEARBOX] and *proofs*[TEST COPY] cannot be inserted in the context of an (event) argument.

To be sure, this toy derivation leaves many questions unanswered, among which possibly the most compelling one involves the presumed optionality of the complement in (31b), vs. its presumed obligatoriness in (31a) (e.g., in the context of a verb such as

<sup>15</sup> The lexicalist rationale as outlined here is directly inherited and actually strengthened by executions which assume External Merge in conjunction with the Inclusiveness Condition of Chomsky (1995b).

<sup>16</sup> The need to capture selective targeting for Content and for phonological realization is not the only rationale available for excluding some operations from the syntax. Other important approaches, beginning with Wasow (1977) focus on formal distinctions between the operations under consideration. In more recent executions, examples of such rationales are in Ackema and Neeleman (2004), where it is argued that the building blocks of morphological structures are formally distinct from the building blocks of syntactic structures, as well as in Horvath and Sioni (2010), where a principled lexicon/syntax rule typology is built around the notion of locality. A full review of these approaches is largely outside the scope of this article, but see Borer (2013b), where the Ackema and Neeleman (2004) building-block claim is specifically addressed.



*prove*). But as we saw, the lexical treatment of complements of DNs in RoN is in fact too coarse, dubbing as optional what are two distinct configurations with different properties, one with an obligatory complement and an obligatory action/event reading, and the other with neither obligatory complement, nor obligatory action/event reading, and potentially, with a non-compositional Content. Subsequent treatments of DNs, both lexical and syntactic, took this question extremely seriously, and provided several compelling answers to it. Reviewing these accounts constitutes the bulk of this chapter, and I turn to them shortly.

Equally importantly, our discussion raises anew the question of the contrast between DNs and gerunds, by demanding a principled account for the ability of unpredictable Content to be inserted in the context of (31b), but not in the context of gerunds (e.g., *Mary's transmitting the documents*). That question as well has been taken up by syntactic accounts in the past 15 years or so, and I will review some of the available answers in section 6.3.<sup>17</sup>

In the subsequent sections, I will return periodically to this overview of RoN, as proposals made by Chomsky (1970) have at times endured beyond lexicalism and into present day syntactic models, including some that lodge the formation of complex words firmly within the syntax. In particular, and as we shall see, the following claims originally made in RoN continue to inform many contemporary claims as well as many contemporary disagreements about DNs and more generally about the syntactic properties of complex words:

32. a. The fundamental building block of substantive vocabulary consists of category-less entries (presently known as *roots*) categorized by their syntactic context.<sup>18</sup>
- b. *Roots* take complements, which are shared across all their categorized instantiations
- c. (Deverbal) DNs (e.g., *deferral*, *adherence*) do not necessarily contain a verbal constituent/stem (otherwise realized as *defer* or *adhere*) but may represent a direct syntactic nominalization of the category-less roots  $\sqrt{\text{DEFER}}$ ,  $\sqrt{\text{ADHERE}}$ .
- d. A correlate of (c): *defer* (a verb) and *deferral* (a noun) are equally complex.

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<sup>17</sup> The regularity of gerunds vs. the unpredictability of DNs plays itself along both Content and phonological dimensions. One suspects, however, that the latter is not a deep distinction. Inflectional marking, by assumption syntactic, displays massive phonological unpredictability, leading one to suspect that the phonological regularity of gerunds has little to do with their syntactic derivation, and everything to do with the properties of *-ing*.

<sup>18</sup> The term *root* in this particular context originally from Pesetsky (1995).

### 3 AS-Nominals vs. R-Nominals: moving to the center stage

#### 3.1 Early Lexical Treatments

The decade following the publication of RoN saw relatively little interest in DNs as such, but a flurry of research on word formation, all grounded in the claim that it represents a restricted hierarchy-building component which is *not* syntactic in nature. The overwhelming consensus as it emerges from that work, say by 1985, is that forms such as *deferral* and *transmission* in both their regular and irregular readings are complex, and that at the very least, they consist of a verbal stem which is combined with a nominal affix and with the latter determining the syntactic category of the form in its entirety. Broadly, then, they adhere to the scheme in (33). (33), in turn, may be a non-syntactic representation, but is nonetheless fundamentally incompatible with the claims in RoN according to which e.g., *defer* and *deferral* are equally complex, and that there exists a category neutral entry, say DEFER, which is realized as either N or V in particular syntactic contexts:<sup>19</sup>

33. [<sub>N</sub> [<sub>V</sub> V] NOM]

Interest in DNs as such resurges in the late 1970's and in the early 1980's, largely because of the increased prominence, within the prevailing Government and Binding model, of argument structure and argumental roles. In that context, the starting point would be *theta* theory, as articulated in Chomsky (1981) and subsequent. That theory comes, at the very least, with the *Theta Criterion* as in (34), and with the *Projection Principle*, as in (35). A related influential development brings on board UTAH, as in (36):

34. **θ-criterion:** Each argument bears one and only one θ-role, and each θ-role is assigned to one and only one argument. (Chomsky 1981, p. 35)

35. **The Projection Principle:**

Representations at each syntactic level (i.e., LF, and D- and S-structure) are projected from the lexicon, in that they observe the subcategorization properties of lexical items. (Chomsky 1981, p. 29),

36. **The Uniformity of Theta Assignment Hypothesis (UTAH):**

identical thematic relationships between items are represented by identical structural relationships between these items at the level of D-structure (Baker, 1985, 1988)

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<sup>19</sup> That words are combinatorial in the relevant sense is first advanced, within a non-syntactic approach, in Halle (1973), with major influential executions in Aronoff (1976), Selkirk (1982), Lieber (1980), Williams (1981), and Di Sciullo and Williams (1987) among quite a few others. A different approach is adopted in Jackendoff (1975), who rejects a combinatorial approach to complex words, and rather states the relationship between *defer* and *deferral* and similar as a mnemonic device involving cross-reference between lexical entries. Nonetheless, Jackendoff's entries are not category-neutral, in the sense of Chomsky (1970). In fact, I am not aware of *morphological* work from the period which pursues a category-neutral approach to complex words, although some syntactic executions presuppose it. The claim that the lexicon consists of category-neutral entries regains significance in the late 90's and at present informs multiple approaches to complex words, a matter I return to in section 4.

The properties of DNs are a natural target of investigation for an articulated model of theta role assignments. Several immediate puzzles present themselves both within the context of RoN, and otherwise. Primary among these inquiries are questions concerning the best way to represent the parallel theta role assignment in verbal/propositional contexts and nominal contexts as in e.g., (37):

- 37. a. Kim referred the patient to the oncological team
- b. Kim's referral of the patient to the oncological team

The parallelism, we note, is particularly theoretically significant if one is to adopt the scheme in (33), where V and N are syntactically distinct entities (and possibly distinct lexical entries). Within the category-neutral approach in Chomsky (1970), there was only one entry with one complementation array. However, if DNs are derived from verbs, the shared argumental array needs explanation.

More specific questions concerning the argumental array within DNs concern the role of prenominal genitives in DNs (*Kim's* in (37b)), when compared to the propositional subject in (37a), on the one hand, and on the other hand to prenominal genitives in underived nominal expressions with their various interpretations, as in (38); the assignment of theta roles when arguments potentially present in the interpretation are not phonologically realized, such as the understood agent in (39a); the properties of *by*-phrases within DNs as in (39b) when compared with propositional ones; and finally, the ability of N, but not V, to occur without arguments altogether as in (39c):

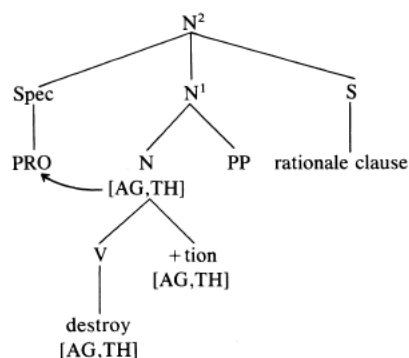
- 38. a. Chomsky's book (ownership, authorship)
- b. Chomsky's picture (ownership, depiction)
- 39. a. The destruction of the hospital
- b. The destruction of the hospital by the air force
- c. The destruction (was horrendous)

The sheer volume of analyses and their diversity makes a complete literature review impossible.<sup>20</sup> I will therefore note several important traits of the bulk of analyses that have emerged roughly between 1979 and 1990, before moving on to the typology made explicit in Grimshaw (1990). With few exceptions, scholars assume something like the scheme in (33), accompanied, to a larger or smaller degree by a mechanism of *inheritance* (following Randall, 1985, 1988), i.e., a formal device that allows the theta roles of V, in (33) or similar, to be assigned within the nominal domain. (40), from Roeper (1987) is quite representative in this respect:<sup>21</sup>

<sup>20</sup> Particularly pivotal early work is Anderson (1977, 1984). Other influential works include, at the very least, Cinque (1980), Rappaport (1983) Lebeaux (1984, 1986), Williams (1987), Safir (1987), Sproat (1985), Roeper (1987), Zubizarreta (1987) and Giorgi and Longobardi (1991)

<sup>21</sup> A notable exception is Lebeaux (1986) executed within an LF affix movement model, where the argumental array continues to be assigned exclusively by the verb, and where the derivation of Action Nominals involves the embedding of a full VP constituent, complete with arguments. That particular

40.



Another common thread that runs through accounts during the 80’s is the dominant focus on Action Nominals. It is frequently observed (e.g., Sproat, 1985; Safir, 1987; Roeper, 1987 i.a.) that there is a correlation between the emergence of an event reading and the presence of arguments, but attention to non-Action Nominals (typically labelled *Result Nominals*) is relatively scant and tends to involve various means of suspension for theta role inheritance or theta role assignment in at least some nominal contexts. Where disagreements linger (to this day) is relative to the role of the prenominal genitive (part of the *theta grid* or not?); on the availability, or lack thereof of a PRO in the pre-nominal position, and on the specific nature and generality of thematic grids and their inheritance.

### 3.2 Focus on R-nominals vs. AS-nominals: Grimshaw (1990)

Taking the previous decade as her starting point, Grimshaw (1990) brings together many of the observations and some of the analyses which predate her alongside some new ones, but nonetheless departs from earlier work in making her primary focus the systematic *dual* representation of DNs as both Action and Result.<sup>22</sup> In what has become the starting point for subsequent analyses of DNs, Grimshaw (op. cit.) provides a set of detailed diagnostics to differentiate (so-called) Result Nominals (*R-nominals* or RNs henceforth) and Action Nominals (variably also labeled as Process Nominals, Complex Event Nominals, and Argument Structure Nominals. Henceforth *AS-nominals* or ASNs).

41.	AS-nominals	R-nominals
a.	<b>Obligatory arguments (where relevant)</b>	No obligatory arguments
b.	<b>Event reading</b>	Event reading not necessary
c.	<b>Agent-oriented modifiers</b>	<b>No agent-oriented modifiers</b>

direction will gain significance, as we shall see, with Valois (1991), Hazout (1991, 1995), Borer (1993) and much subsequent research.

<sup>22</sup> Contemporaneously, the very same focus informs Picallo (1991), who offers a substantially different analysis from that proposed by Grimshaw (1990), a matter I return to in section 4.1.

d.	Prenominal genitives are arguments	Prenominal genitives are possessives
e.	<b><i>by</i> phrases are arguments; P is identical to that used in verbal passive</b>	<b><i>by</i> phrases are non-arguments; in some languages, P differ from verbal passive <i>by</i>-phrases</b>
f.	<b>Implicit argument control (alternatively <i>event control</i>)</b>	<b>No implicit argument control (alternatively no <i>event control</i>)</b>
g.	<b>Aspectual modifiers such as <i>for three hours; in three hours</i> internal to the DN</b>	<b>No aspectual modifiers internal to the DN</b>
i.	<b>Do not allow demonstratives; <i>kind- of</i> expressions</b>	<b>Allow demonstratives, <i>kind-of</i> expressions</b>
j.	May not appear as predicates	May appear as predicates
k.	Do not allow post-nominal genitives	Allow post-nominal genitives
m.	Mass noun: no numerals, including <i>one</i> , no indefinite article	Count noun: numerals, indefinite article, and plural marking possible
n.	Modifiers such as <i>frequent</i> and <i>constant</i> may occur without plural	Modifiers such as <i>frequent</i> and <i>constant</i> require plural

Subsequent investigations revealed that some of these tests are less reliable than others, and some generalizations may have been premature. The tests in bold, however, remain, to the best of my knowledge, not only robust in English, but replicable, to a surprising extent, in a broad range of languages (see Rozwadowska, 2006, 2017 for a review).<sup>23</sup> The core diagnostics are exemplified for AS-nominals in (42) and for R-nominals in (43):

<sup>23</sup> For the limitations on the distribution of plurality and the mass denotation of AS-nominals, see Borer (2005b) and Alexiadou, Iordachioaia & Soare (2010), where, following Mourelatos (1978), it is shown that the mass/count status of AS-nominals is contingent on the (a)telicity of the event denoted as illustrated in (i).

- i.
  - a. pre-planned, controlled demolitions of the three World Trade Center Towers
  - b. The Clinton County Commissioners on Friday approved two companies to do three demolitions of properties
  - c. multiple extinctions of small sub-populations
  - d. secondary extinctions of biodiversity

The distribution of *frequent* and *constant* without plurality tracks mass vs. count as well, and is therefore tangential to the AS- vs. R- nominals distinction, as (ii) shows

- 42. a. The instructor's (intentional) examination of the student
- b. The monitoring of wildflowers by experts to document their disappearance
- c. The destruction of Rome in a day
- d. The production of luxury cars for several years
- e. \*This destruction of Rome in a day
- f. \*this kind of destruction of a city/bombing of hospitals
- 43. a. The instructor's examination/exam
- b. Jessica's collections
- c. This kind of destruction/bombing

Corroborating the typology and highlighting its grammatical nature, we note that an attempt to mix the properties of these distinct nominal types leads to ungrammaticality:

- 44. a. \*Jessica's frequent collection
- b. \*the collection to document the disappearance of mushrooms
- c. the examination/exam (\*by Jules)
- d. \*The destruction in a day

Grimshaw proposes to account for this array of facts by assuming that R-nominals select a referential index (*R*), as an external argument (in the sense of Williams, 1981), while AS-nominals select an event argument as their external argument (*Ev*). The selection of *Ev* leads to an event reading. An accompanying crucial assumption is that argumental roles are only possible in the presence of *Ev* (see Sproat 1985 for the same claim). The range of (bold) distinctions in (41) now emerges in the following manner: (41a-b) are simply the basic distinction, deriving from the presence vs. absence of *Ev* and *R* respectively. The absence, in R-nominals, of agent-oriented modifiers, (41c) as well as argumental *by* phrases (41e) follows from the lack of *Ev* and the consequent argument structure. The availability of implicit argument control (or event control) in AS-nominals follows again from the presence of the grammatical event argument, *Ev*, as does the distribution of aspectual modifiers, under the assumption that these may only modify grammatical events, and as such, are excluded in R-nominals. Finally, we may

- 
- ii a. frequent pain/fever/rage/mayhem/noise/disarray
  - b. constant fit/turmoil/havoc/mess/unrest/uproar

Finally, a clarification is in order concerning the diagnostics in (41a-b), as the matter is frequently misconstrued. For both (41a) and (41b), the contingency is unidirectional, as stated in (iii). Neither the presence of complements, certainly possible in underived nouns, nor an event construal, as well possible in underived nouns, are sufficient to establish the presence of an AS-nominal. Their absence (in a deverbal DN), however, suffices to establish the presence of an R-nominal and exclude ASNs.

- iii. non-eventive DN → R-nominal
- Absence of complements → R-nominal



assume that demonstratives and *kind-of* expressions requires the presence of R to be licit, thereby excluding AS-nominals.<sup>24</sup>

While Grimshaw herself does not discuss explicitly the interaction between word formation and syntax, her discussion of the properties of DNs places her within the morpho-lexicalist tradition. She assumes without discussion that both R-nominals and AS-nominals are derived in the lexicon, and project as N heading an NP in the syntax. The differences between them are the result of a different value assigned to their external argument, as part of their lexical properties and emerging from their lexical derivation. More specifically, Grimshaw assumes that NOM affixes are lexical entries with specific morpho-semantic properties, which impact the emergence of the *Ev/R* distinction in the following way:<sup>25</sup>

45. NOM- <i>atk</i>	NOM- <i>ing</i>	NOM- $\emptyset$
<i>Ev/R</i>	<i>Ev</i>	<i>R</i>

Specifically, while NOM-*atk* affixation may give rise to both R-nominals and AS-nominals, the claim is that NOM-*ing* affixation is always associated with *Ev*, and that zero-NOM is never associated with *Ev*. These, Grimshaw claims, account for the data in (46)-(47):

- 46. a. The collection of mushrooms for three months
- b. The falling of housing prices for three years
- c. \*The kill of innocent civilians in three days
- 47. a. The collection was complete
- b. \*The falling was precipitous
- c. We are ready for the kill

By way of an interim summary, then, within the Grimshaw system the choice of *Ev/R* appears idiosyncratic, insofar as it is contingent on the NOM instantiation available for particular verbs. However, once *Ev*-NOM or *R*-NOM are selected, the properties of the emerging nominal become predictable and syntactically well-behaved.

### 3.3 Some issues

While the typology outlined in (41) has, by and large, survived the test of time and some important aspects of it have been shown to apply cross-linguistically, several conceptual and empirical problems have emerged in the subsequent decades with some of the specifics of the proposal.

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<sup>24</sup> The discussion glosses over a matter that is extremely important for nominal structure, and which was briefly touched upon in fn. 7, which concerns the extent to which a single functional node, call it D, widely considered to be implicated in the emergence of reference, could be considered to dominate as diverse nominal structures as gerunds, AS-nominals, R-nominals, and underived nominals.

<sup>25</sup>-*atk*, recall, for -*Attion* and *Kin*, the host of non-*ing* NOM realizations in English.

### 3.3.1 Conceptual considerations: Simple event nominals and event arguments

As Grimshaw herself points out, event denotation for nominals is possible without a derivational history, without the availability of NOM-Ev or event arguments, and with the diagnostics associated with R-nominals. Some examples are in (48), with (49) illustrating the failure of AS-diagnostics. I take the availability of the relevant nominals in the context of *lasted x time*, *started at x time* or *took place at* to be the relevant test for the availability of an event denotation:<sup>26</sup>

- 48. a. the lesson/the class started at 3pm
- b. the concert/opera lasted 3 hours
- c. the reported event took place in the city center.
- 49. a. \*the lesson (in physics/of physics) in three hours/for three hours
- b. \*Jessica's intentional class in woodworking/woodworking class
- c. \*a deliberate concert by Anna Netrebko
- d. \*the physics lesson in order to understand quantum theory
- e. This kind of physics lesson/class/opera/concert/event can last a while

To differentiate these event nominals from those with the diagnostics of AS-nominals in (41), Grimshaw labels them *Simple Event Nominals*, contrasting as such with *Complex Event Nominals*, here labelled AS-nominals to side-step the presumption of complexity. The existence of Simple Event Nominals with *R* but without *Ev* alongside Complex event Nominals with *Ev* raises, however, an important question: why should only nominals derived from verbs exhibit the properties associated with fully developed argument structure, and why are these properties completely absent from the entries of underived nominals, even when they denote an event?<sup>27</sup>

Viewed differently, it is rather clear that AS-nominals retain, in essence, all the relevant properties of their verbal source, including, in all likelihood, the event argument. As in Simple Event Nominals there is no embedded verbal source, a true *syntactic* event, call it *Ev*, cannot be present. But such a correlation is rather difficult to capture within a lexicalist approach, where one does not expect the presence of syntactic properties which may *only* be associated with morphologically complex entries, but excluded in morphologically non-complex ones. Differently put, within most lexicalist approaches to listedness, and certainly within the RoN framework, the ontological status of underived entries and derived entries is identical: they must avail themselves of the same inventory of features and properties, and the emergence of properties which reflect their derivational history is unexpected. Consequently, there should not be any difference between the properties of (for example) *performance* which is related to a verbal entry *perform*, and the properties of *concert*, as both *concert* and *performance*

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<sup>26</sup> Because the overwhelming majority of English monomorphemic verbs have corresponding zero-N instances, the exclusion of a verbal source is not always a self-evident matter. To the extent possible, examples of so-called Simple Event Nominals here and elsewhere therefore resort to nominals which absolutely do not have a correlating verb, a fairly limited choice, and frequently not an obvious one.

<sup>27</sup> Alternatively, predicative properties associated with de-adjectival nominals, but not with underived nominals, a matter set aside in this review.

make reference to an event. All the more so as in Grimshaw's system it is the varied instances of NOM, which are themselves N, not V, that contribute the distinct semantics.

One might seek a solution to this problem by developing an appropriately constrained theory of *inheritance*: the availability of a principled mechanism by which arguments may be inherited by a derived form from a stem embedded within it (see Randall 1985, 1988, as well as Roeper, 1987 and others, or, for that matter, Grimshaw's 1990 treatment of light verb constructions). Within the set of assumptions otherwise made by Grimshaw, it could be suggested that such inheritance may take place if NOM is an *Ev* selector, but not when it is an *R* selector. We note, however, that if one is to subscribe to the view that the event argument is a grammatical object with a similar ontology to that of theta roles, then it must be the case that lexical entries of verbs do not just come with classical thematic roles such as agent or patient, but also with an event argument.<sup>28</sup> There now emerges a certain redundancy relative to the assignment of *Ev* by NOM. Such assignment, it appears, is only possible when there is a verb available from which the resulting DN can inherit its theta grid, but that theta grid already includes *Ev*, making the independent assignment by NOM redundant (alternatively, the derivation requires the suppression of the event argument associated with the verbal entry, or the linkage of the two). The conceptual problem is now apparent: in all cases, argumental event structure for DN is only available if it effectively matches that of an embedded verb, including the presence of an *Ev* argument. The properties of underived Simple Event Nominals follow directly, of course, and AS-nominals become but a conduit for the instantiation of verbal roles in a nominal context. Contra Grimshaw, there is no evidence here for any direct *Ev* assignment by NOM itself, or for any event construal that is grammatically associated with the category N as such.<sup>29</sup>

Remaining on the conceptual level, here, matters become even trickier when we consider R-nominals. The null hypothesis, and certainly the one entailed by Chomsky (1970) and most of the subsequent literature on DNs in the 80's, is that the relationship that holds between the verb and the DN is constant, regardless of the particular interpretation of the emerging DN (see section 2.3 for some discussion). If, as is assumed in much of the subsequent literature, and including Grimshaw, that means that R-nominals, just like AS-nominals, have the internal structure in (33), it is not easy to state how and why the inheritance of the verbal theta grid is blocked for R-nominals, but licensed and in fact forced for AS-nominals.<sup>30</sup> Nor is it obvious, relative to the

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<sup>28</sup> The presence of an event argument as part of the theta grid of the verb is, fundamentally, a specific execution of Davidson (1967) advanced in Higginbotham (1985). It also serves as the cornerstone of the analysis of AS-nominals in Sproat (1985) and many present-day executions. (albeit associated with *v*, rather than *V*). For some discussion, see section 6.2.

<sup>29</sup> Grimshaw (op. cit.) is in fact quite committed to the claim that argumental roles in the context of *Ev* are assigned/licensed by NOM, and not by the embedded verb, and that claim underlies an extensive discussion of cases in which selectional properties of AS-nominals and the verbs embedded within them differ, focusing, in particular, on variable prepositional selection and on the putative absence of ASN readings for DNs with sentential complementation. At least some of these claims have been empirically challenged in subsequent literature.

<sup>30</sup> Classical inheritance models would not necessarily be more equal to the task of the obligatory omission of the verbal arguments, including the event argument, for R-nominals. Such inheritance

suppression of the verbal argumental roles, including the event argument, how to model that suppression. We note that such suppression is in violation of UTAH, even within a lexical execution.

Note, finally, that R-nominals may denote a simple event, and that in fact, R-nominals, far from denoting a *result* as such, may have the full range of readings otherwise available for underived nominals, as illustrated in (50)-(53), together with similar underived nouns. This, of course, is entirely compatible with the claim that non-ASNs are in a relationship of predication with a referential index, R, probably in D. The challenge, nonetheless, remains tied to the suppression of the verbal grid for R-nominals, but not for ASNs.

50. *Result/state:*

- a. The destruction was complete (cf. *the anarchy was complete*)
- b. affordable housing (cf. *affordable apartments*)
- b. Take care of your appearance! (cf. *face*)
- c. the collision left an impression (cf. *dent*)

51. *Object*

- a. an invention, an assignment, an entrance (*gadget; task; door*)
- b. a crossing, a binding, a saying, (*crossroad, strap, idiom*)

52. *Event:*

- a. The examination started at 3pm and lasted 2 hours
- b. The bullying started when she arrived there and never stopped

53. *Unpredictable (object, event)*

- a. transmission, recital (*gearbox, concert*)
- b. reading (=interpretation); bedding (*perspective, linen*)

### 3.3.2 Conceptual considerations: Morphological ramifications

A query that extends beyond Grimshaw's specific execution concerns the relationship between affix selection and structural possibilities. Most centrally, if indeed DN<sub>s</sub> are systematically ambiguous (rather than vague), why should they be so frequently and cross-linguistically marked with an identical affix? For Grimshaw's (1990) own execution, this query is limited to NOM-*atk*, as for her, both NOM-*ing* and NOM- $\emptyset$  are unambiguous. As we shall see shortly, however, the claim that DN-*ing* are always ASNs and DN- $\emptyset$  are always RNs has been challenged, leaving the issue of homophony in need

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models are typically concerned with characterizing the type of configurations in which inheritance is blocked in principle, allowing arguments otherwise to be optional. An indicative case would be in (i), where the direct complement is optional, therefore, by assumption, allowing *writer* to inherit the internal argument of *write*, but the adjunct is blocked (see, in particular, Randall 1985, 1988 for discussion).

- i. a. a writer
- b. a writer of brochures
- c. \*a writer (of brochures) with a pen

Selective blocking determined by a feature of NOM therefore presents a theoretical challenge.

See section 6.2, for a discussion of contemporary accounts which assume that RNs do not contain an embedded verb.

of an account. Similar conceptual difficulty marks not only lexical, but syntactic accounts, as we shall see.<sup>31</sup>

### 3.3.3 Empirical Considerations: *NOM-ing*

The claim that *DNs-ing* always denote action or activity is common in the literature and both predates and post-dates Grimshaw's (1990) treatment, with exceptions (of which there are quite a few) typically put down to listing (but see section 2.3 on the problematicity of listed idiosyncrasy). The observation appears largely correct, insofar as it is not easy to get a veritable result reading in the context of *DNs-ing*. But the absence of a result reading is a very distinct matter from the claim that *-ing* nominals are always AS-nominals, as the absence of a result reading is not only a feature of AS-nominals, but of Simple Event Nominals as well, and the latter, clearly, have distinct grammatical properties from AS-nominals.

Nonetheless, the claim that *NOM-ing* is only available in ASNs has gained considerable traction and has been adopted by a significant number of non-lexical approaches to *DNs* as well. By way of an incomplete review, van Hout and Roeper (1998) explicitly assume that *NOM-ing* must merge with Voice and T and therefore is inevitably an AS-nominal. Similarly, Marantz (1999), as well as Alexiadou (2001), propose to merge *NOM-ing* with *v* or Voice thereby forcing it to be an AS-nominal. *NOM-atk*, on the other hand, may (or must) merge below *v*, therefore allowing AS to be absent. In a later execution, Alexiadou and Grimshaw (2008) as well as Alexiadou (2009, 2013) assume that both *NOM-ing* and *NOM-atk* merge above (some portions of) the verbal spine. However, they do differ, because *NOM-ing*, in both DN and gerunds, per force merges above Voice, by assumption the locus of argumental event information, while *NOM-atk* only merges with Voice optionally. The structure thus effectively forces *DN-ing* to be an AS-nominal. Guided by the desire to unify the treatment of *-ing* across gerunds and *DNs*, Sichel (2010) assumes that *NOM-atk* licenses a single event but *NOM-ing*, in both gerunds and *DNs*, licenses a 'complex' event, i.e., an event with a dependent sub-event. As such, *DN-ing*, again, must be an AS-nominal (and see section 5.2 where some of these accounts are revisited).

As it turns out, however, a careful investigation of *DNs-ing* shows that while they clearly strongly favour an event denotation, and more specifically, an activity reading, that event denotation may come *without* the diagnostics of ASNs, and rather, correspond to the properties of Simple Event Nominals. An appropriate starting point are the examples in (54)-(55), discussed in Borer (2013b), with instances of *DN-ing* which clearly correspond to activity events, but which do not display the properties of ASNs:

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<sup>31</sup> An additional conceptual inquiry of some significance concerns the relationship between the phonological realization of affixes, and the emerging syntax. Specifically, *NOM-ing* is available for just about all English verbs, and *NOM-Ø* to the overwhelming majority of English monomorphemic verbs, but to a few, if any, derived verbs. Finally, most instances of *NOM-atk* are restricted to Latinate vocabulary, and are root selected. As a result of this constellation of morpho-phonological restrictions, some English verbs absolutely cannot have an RN instantiation because of phonological realization issues which are independent of either syntactic structure or interpretation (with e.g., *sicken* or *blacken* serving as examples), an intriguing result which deserves investigation.

54. "Women are reared not to feel competent or gratified by *the questing, the competing, the outbidding* that collecting ... demands."

S. Sontag, *Volcano Lover*, p. 138

55. This kind of (new) fighting/ fraternizing/ parenting/ terrorizing/ bidding/ bullying/ craving/ viewing/ sinking (ambiguous)/ breaking (ambiguous)/ growing(ambiguous)

Importantly, these are not truncated gerunds, as indicated by the definite article in (54), and by the occurrence of *this kind of/this type of* nominals in (55), otherwise not possible for gerunds:

56. \*This kind of fighting the enemy/ parenting the baby/ terrorizing the innocent/outbidding Jamie/ bullying the neighbour/ craving sugar....

Note further that while gerunds bar a prenominal temporal expression, these are good with the argument-less DNs-*ing* under consideration here:<sup>32</sup>

- 57. a. \*yesterday's fighting the enemy/ parenting the baby/ terrorizing the innocent/outbidding Jamie/ bullying the neighbour/ craving sugar....
- b. this month's (unexpected) fighting/ fraternizing/ parenting/ terrorizing/ bidding/bullying/craving/viewing/sinking [ambiguous]/growing (ambiguous)

That pivotal tests for AS-nominals fail, is shown by the impossibility of implicit argument control and by the impossibility of aspectual modification:

- 58. a. yesterday's (unexpected) terrorizing (\*in order to extract ransom)
- b. this year's (new) craving (\*for several months)
- c. this is a kind of (recent) bullying (\*in order to make up for low self-esteem)]

For the sake of completeness, note that these could not be cases of object deletion in generic contexts as attested in English present tense (*dispositional* cases, in the sense of Mittwoch, 2005), where event properties *are* retained:

- 59. a. The army terrorizes in order to intimidate
- b. Guy bullies in order to make up for low self-esteem
- c. He can bully maliciously for hours

Finally, while the DNs-*ing* under consideration here fail tests for ASNs, they do fit comfortably into contexts which otherwise yield a simple event interpretation:

60. That (relentless) craving/bullying/fighting/fraternizing started at noon, and didn't end until 8pm

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<sup>32</sup> Grimshaw (1990) proposes the distribution of prenominal temporal modifiers as a test marking the presence of R-nominals, but unlike gerunds, judgements on the distribution of prenominal temporal modifiers in AS-nominal contexts are disputed. The test, then, serves to exclude the bare DNs-*ing* under discussion here as gerunds, but may not be sufficient to exclude them as a specialized form of AS-nominals. The latter task is rather accomplished by the absence of arguments, as well as the impossibility of implicit argument control and aspectual modification in examples (58a-b).



The properties of synthetic compounds further indicate that the claim that DN-*ing* is always an AS-nominal cannot be upheld. As has been observed (van Hout and Roeper, 1998; Borer, 2012, Harley, 2009a), -*ing* synthetic compounds do not adhere to the diagnostics of AS-nominals, as the contrasts in (61) show:<sup>33</sup>

- 61. a. The breaking of the door by Mary in two minutes in order to retrieve her locked-up dog
- b. The bombing of infrastructure by the Israeli army for ten days in order to destroy the Gazan economy
- 62. a. (I watched) the door breaking (\*by Mary) (\*in two minutes) (\*in order to retrieve her locked-up dog)
- b. (I read about) the infrastructure bombing (\*by the Israeli army) (\*for ten days) (\*in order to destroy the Gazan economy)
- c. Yesterday's door breaking/infrastructure bombing

It seems warranted, then, to conclude that while an activity event reading is strongly favoured in the context of NOM-*ing*, the conclusion that this event reading is always associated with ASNs is not empirically supported. To be sure, an explanation is called for, given the near universal exclusion of result readings for *ing* R-nominals, and such an explanation, it would appear, should, indeed, reside with a better understanding of the properties of NOM-*ing*, and possibly *ing* in general. The matter, however, is set aside here. <sup>34</sup>

### 3.3.4 Empirical Considerations: DN-Ø

On its face, the exclusion of ASNs in the context of non-overt categorial marking appears to garner considerable support from the fact that the overwhelming majority of English monomorphemic verbs have an unmarked nominal alternant, that the alternant overwhelmingly tends to have an event or a state denotation but nonetheless exhibits the diagnostics of an R-nominal. A partial list is in (63), with simple event diagnostics in (64), and the exclusion of ASN diagnostics in (65):

- 63. (an) arrest; bite(s); (a) break; cause(es); (a)chase; climb(s); (a)descent; export(s); (a) fall; (a) float; (a) follow-up; (a) frown; (much) hate; (the) hold; (every) import; (a) jump; (a) kill; (some) kiss; (a) laugh; (the) lick; (a)lie down; lift(s); (a)look; (little) love; (a) make; (some) mock; (a) move; (every) raid; (a) ride; (a) rock; (a) roll; run(s); (a) scream; (a) sit-in; (a) smile; (a) smoke; (a) stand; (a) take; (a) talk; (a) think; (a) touch; (a) turn; (a) twist; (a) view; (a) walk; (a) whisper; .....
- 64. The move/export/fall/float/contact (etc.) took place earlier today

<sup>33</sup> Both Borer (2012) and Harley (2009a) take these data to indicate that DN-*ing* need not be AS-nominals. Van Hout and Roeper (1998), however, opt to maintain the claim that synthetic compounds are AS-nominals, at the cost of dispensing with substantial portions of the Grimshaw diagnostic table.

<sup>34</sup> A possible account for the obligatory activity reading restriction for NOM-*ing* would link it with the otherwise observed fact that NOM-*ing* forces the existence of an agent construal. NOM-*ing* shares this 'agentive' property as well as the activity property with the progressive -*ing*, but not necessarily with -*ing* gerunds. For some relevant perspectives and discussion, see, i.a., Sichel (2010), Alexiadou (2001, 2020 i.a.), and Borer (2013b).

65. The move (\*of the piano, \*in/for 2 minutes) (both transitive and intransitive)  
The walk (\*of the dog, \*for 2 hours)  
Let's have a smoke (\*of a cigarette, \*for 5 minutes)  
The contact (\*of the manager, \*in/for 2 minutes) etc.

Additional evidence for the absence of an ASN construal for DN- $\emptyset$  comes from Bruening, (2013) who observes that they are excluded with binomial *each*, licit for verbal structures, and licit for deverbal ASN-*ing* or ASN-*atk* instantiations, but illicit for simple event nominals as well as for regular (underived) nominals:

66. a. the barbarians' destruction of two houses each  
b. the doctors' detection of two tumours each  
c. the patients' perception of two twinges each
67. a. \*the children's sense of two dangers each  
b. \*the children's fear of two dogs each  
c. \*the professors' respect for two students each
68. a. \*the children's two kittens each  
b. \*the children's kittens from two breeders each  
c. \*the children's presents from two uncles each (p. 18)

In attempting to account for this generalization, Borer (2003, 2013b) suggests that while both DN-*atk* and DN-*ing* are true verbal derivatives, the nominal instantiations in (63) are not derived from a verbal source, but rather, both verb and noun emerge from the categorization of an otherwise a-categorial root. Setting aside execution details, if one is to assume that grammatical event structure and therefore ASNs must be associated with a verbal spine, the absence of event properties for a root derivative follows.

From its onset, however, and the supporting evidence in (63)-(68) notwithstanding, it was clear that exceptions to Grimshaw's original claim abound. E.g., Newmeyer (2009), while acknowledging that the overwhelming majority of ASN nominals are morpho-phonologically complex, nonetheless puts the number of exceptions he is aware of at 'literally dozens'. Some well-known such exceptions are in (69):

69. a. The change of the guards in order to allow time for rest  
b. The deliberate use of the fax machine by the staff for 2 weeks to avoid having to get rid of it  
c. The army's release of the prisoners in order to reward good behaviour (and  
d. As well as *murder*, *discharge*, *endeavor*, *abuse*, *access*, *consent*, *resolve* and others

A systematic challenge to Grimshaw's original claim, as well as the analysis put forth in Borer (2003, 2013b) is mounted in Iordăchioaia (2019, 2020). Expanding quite considerably the pool of zero-derived ASNs, Iordăchioaia offers an account which is based on the semantics of the root involved. Zero-marked nominals formed of result-denoting roots (in the sense of Beavers and Koontz-Garboden 2012, 2020 as well as Beavers et al. 2021) do form felicitous ASNs, while those that are formed from *property*

roots do not. Following the analysis in Beavers and Koontz-Garboden (op. cit.), Iordăchioaia (2020) suggests that result-denoting roots are instantiated in a verbal structure, and consequently allow ASN instantiations. Property roots, on the other hand, are by default instantiated as adjectives, and appear to require an overt verbalizer to give rise to a change of state reading. Under the assumption that zero-marked nominalization is not available for derivatives, these are blocked as zero-marked ASNs.<sup>35</sup>

#### 4 Word formation: Syntactic? Lexical?

Section 3 reviewed the move of the distinction between R-nominals and AS-nominals to the forefront of the generative debate over the nature of DNs. In that context, I reviewed the major diagnostics put forth in Grimshaw (1990) and proceeded to evaluate both her theoretical claims and her empirical conclusions in view of subsequent investigations. By and large, however, that section proceeded without detailed concern for the syntactic structure of DNs, where, by *syntactic structure* I refer both to the structure of the DN-terminal (e.g., the phonological words *reading*, *destruction* etc.), and the overall structure of the nominal expression which it heads. Thus, while most accounts reviewed thus far assume (contra Chomsky 1970) that DN-terminals are complex in some morphological or syntactic sense, little was said about that complexity, beyond postulating the schematic structure in (33) and remaining non-committal regarding its syntactic status. Little, as well, was said about the manner in which argumental roles are discharged or assigned within nominal phrases headed by DNs beyond the sample execution in (40), except to note that (40) shares with most of its contemporaries, including Grimshaw's (1990) structures, the claim that the argumental array is wholly projected (=externally merged) within the nominal domain. Even when inheritance of some form is assumed, it is typically formulated as an operation impacting the interaction between an  $N^0$  and the lexically specified thematic grid of a head embedded within it (typically a verb) so as to allow all arguments, *syntactically*, to be direct arguments of the nominal, and not of the verb embedded within it.

We note, finally, that all accounts reviewed so far from the 80's and 90's, and including Grimshaw's, reject the claim that lexical entries are category neutral, postulating, in its stead, a derivational relationship between a verb stem and NOM.

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<sup>35</sup> Iordăchioaia (2019, 2020) is corpus based, and as a result, suffers from predictable limitations associated with the absence, in corpora, of crucial examples required to establish the ASN vs. RN status of nominals. Absent detailed experimental investigation appealing to judgements, the size of the zero-marked ASN pool therefore remains undetermined. Recall, in this context, that the presence of complements, in and of itself, is not sufficient to establish the existence of an ASN (see fn. 24), and yet it is utilized quite frequently as the sole test for their presence within corpus-based studies. Within recent treatments of DNs, this is particularly applicable to multiple corpus-based 'counterexamples' in Lieber (2016), where AS-diagnostics do not hold once the relevant examples are subjected to closer scrutiny.

70.  $[_{NP} \text{ the army } [_{N'} \text{ } [_{N} [_{V} \text{ destroy } ] \text{ +NOM} ] \text{ the radio station} ] ]]$  Sproat (1985)  
 $\langle 1, 2, E \rangle \quad \langle V, N \rangle \langle 1 \rangle$

71. a.  $[_{D} \text{ ...} [_{N} \text{ NOM } [_{\text{theta phrase}} \sqrt{\text{DESTROY the radio station}} ] ] ]]$  Picallo (1991)  
 b.  $[_{T/I} \text{ } [_{V} \text{ V-theme vowel } [_{\text{theta phrase}} \sqrt{\text{DESTROY the radio station}} ] ] ]]$

72.  $[_{N} \text{ NOM } [_{VP} \text{ the army } [_{V'} \text{ destroy the radio station} ] ] ]]$  Borer (1993)  
 $[_{T/I} \text{ } [_{VP} \text{ the army } [_{V'} \text{ destroy the radio station} ] ] ]]$

73. a.  $[_{D} \text{ (the army) } [_{\sqrt{P}} \sqrt{\text{DESTROY the radio station}} ] ]]$  Marantz (1997)  
 b.  $[_{V-1} \text{ the army } [_{\sqrt{P}} \sqrt{\text{DESTROY the radio station}} ] ]]$

74. a.  $[_{D} \text{ the army } [_{F} [_{ASP} \text{ the radio station } [_{v} [\sqrt{\text{DESTROY}} ] ] ] ] ]]$  Alexiadou (2001)  
 b.  $[_{FV} \text{ the army } [_{ASP} \text{ the radio station } [_{v} [_{v} \sqrt{\text{DESTROY}} ] ] ] ]]$

75. a.  $[_{D} \text{ (the army) } [_{n} \text{ } [_{n} \text{ } \mathbf{n} + \sqrt{\text{DESTROY}} ] \text{ the radio station } ] ]]$  Marantz (2001)  
 b.  $[_{FV} \text{ the army } [_{v} \text{ } [_{v} \text{ } \mathbf{v} + \sqrt{\text{DESTROY}} ] \text{ the radio station } ] ]]$

<sup>36</sup> Some early delimited instantiations are Borer (1984a,b, 1991), Sproat (1985), Pesetsky (1985), Baker (1985), Lieber (1992), i.a. Within the area of DN, the earliest instantiations I am aware of are Sproat (1985), Lebeaux (1986), Hazout (1991), Valois (1991) and Picallo (1991).

Borer, 30/69

categorizing terminal above the argumental domain (NOM, *V-theme vowel*), while in Marantz (1997) NOM is altogether absent, and the root is realized as a ‘nominal’ form solely by merging under D.<sup>38</sup> Like Picallo (1991), Borer (1993) assumes that the full argumental array, including the external argument, merges below NOM. However, unlike Picallo (1991), Borer assumes that domain is perforce a verbal one. Finally, as in Marantz (1997), Alexiadou’s (2001) structures contain no NOM, but unlike Marantz (1997, 2001) and like Borer (1993), her structures do contain a verbal constituent embedded under D. Within that verbal constituent, the internal argument is a specifier of ASP, rather than a complement of the root. In turn, and as in Marantz (1997), for Alexiadou, *destroy* and *destruction* are but distinct root realizations in the context of *v* and D respectively.<sup>39</sup>

In Marantz (2001), with the structure in (75), the categorizing function is taken over by *v* and *n*, thereby allowing (and indeed forcing) structural complexity. However, here as well the verbal and the nominal instantiations are equally complex, and the fact that the nominal instantiation is a phonological superset of the verbal one is set aside. A certain oddity accompanies Marantz (2001), as arguments are selected by the root, but project as sisters of *v* and *n* respectively, and therefore not as sisters of their selecting head.<sup>40</sup> This contrasts with Picallo (1991) and with Borer (1993), where nominalization is above the role assignment domain, as well as with Alexiadou (2001) whose internal arguments are realized in aspectual specifiers, following logic originally developed in van Hout (1994, 1996a, 1996b), Borer (1994), and others. Finally, and with the exception of Marantz (1997, 2001), authors assume the structures above to give rise to ASNs. Concerning RNs, Sproat (1985), Picallo (1991) and Borer (1993 but not subsequent) explicitly assume that they are not syntactic, a matter I return to in section 6. Alexiadou (2001), on the other hand, does assume a syntactic derivation, a matter to which I return in section 6. In line with failing to represent in anyway the distinction between ASN and RN, Marantz (1997, 2001), explicitly challenges the validity of the Grimshaw typology.

With these elaborations in mind and taking on board additional relevant claims, suppose we now assess the range of answers provided by these different accounts to some crucial questions concerning DN, when compared with the fundamentally lexicalist account offered by Grimshaw (1990).

<sup>38</sup> The contextual realization of DN in the context of D in Marantz (1997) differs fundamentally from the contextual categorization proposed in Borer (2003, 2005, 2013b), insofar as for Borer, the root within DN is inevitably verbalized either through the argumental array, for ASN, or by the properties of NOM as a functor which projects N and selects V (N[V]). As a result, DNs are inevitably complex. While a root can certainly be ‘nominalized’ in the environment of D, such nominalization could never give rise to DN in any of its instantiations.

<sup>39</sup> In (74a) the realization of  $\sqrt{\text{DESTROY}}$  as *destruction*, for Alexiadou (2001), requires  $\sqrt{\text{DESTROY}}$  to move to F, to be in the local domain of D.

<sup>40</sup> Marantz (1997, 2001), it would appear, attempts to model within the syntax as closely as possible the RoN system, where arguments are selected/subcategorized in their category neutral local context, but are realized syntactically as complements of either V or N. While this RoN translation works relatively straightforwardly for (73a), it runs into execution issues with the addition of categorizing nodes in (75a).

76.	<i>The issue</i>		1	2	3	4	5	6	7
	A	Can nominal structures correspond to grammatical (complex) events with event arguments directly projecting within the nominal domain, however otherwise licensed? <sup>41</sup>	Y	Y	N	N	Y	N	Y
	B	How are such nominal arguments licensed (where the answer to (76A) is YES)	<i>Ev</i>	Embedded V	n/a	n/a	root	n/a	root
	C	Is there a grammatical distinction between ASN and RN?	Y	Y	Y	Y	N	Y	N
	D	And if the answer to C is yes, is there more to R-nominals than listed lexical listing?	Y	N	Y	Y	n/a	Y	n/a
	E	Do (all) DNs necessarily contain a verbal domain?	N	Y	N	Y	N	Y	N
	F	Must DN be morphologically derived from a verb?	N	Y	N	Y	N	N	N
	G	Are prenominal genitives in English ASNs arguments? (By extension, does the argumental array within ASN include the external argument)?	N	Y	(N)	Y	N	N	N

1: Grimshaw (1990); 2: Sproat (1995); 3: Picallo (1991); 4: Borer (1993); 5: Marantz (1997); 6: Alexiadou (2001); 7: Marantz (2001)

<sup>41</sup> The formulation of the queries in (76A) attempts to remain neutral on whether the argumental interpretation emerges from a root, the N itself, or through inheritance. As such, a NO answer would entail that all event arguments within the nominal domain were assigned their role elsewhere (plausibly in some embedded phrase), and their occurrence within the immediate nominal domain is the result of movement.



What should be evident from the distribution of answers in (76A-G) is that by and large, lexical and syntactic executions allow the same range of possible answers to the relevant questions and face identical challenges. Relative to our detailed discussion of the Grimshaw system, a lexical one, we note that there is nothing which is inherent to the lexical or the syntactic account as such which forces the distinction between ASN and RN, assumed, within lexicalist accounts, by Grimshaw (1990), but not, e.g., by Roeper (1987), and for syntactic accounts by Sproat (1985), Picallo (1991), Borer (1993) and Alexiadou (2001), but not by Marantz (1997, 2001). Nor does the choice between a lexical treatment or a syntactic treatment, as such, determine the status of pre-nominal genitives as parts of the event argumental array. That they are argumental has been assumed by Roeper (1987) within a lexicalist approach, and by Sproat (1985) and Borer (1993) within a syntactic one, but not by Grimshaw, within lexicalism, nor by Alexiadou (2001) or Marantz (1997, 2001), with their syntactic execution.<sup>42</sup> Equally non-uniform, within syntactic approaches, is the treatment of RNs, with some subscribing to the view that it is fully syntactic (Alexiadou, 2001), and others opting to represent its properties non-syntactically. As we shall see, answers to these different questions continue to diverge on their treatment of RNs within the now dominant field of syntactic accounts.

The accounts sketched here further differ on their endorsement of a direct event interpretation and argumental roles for nominals, and that distinction, yet again, does not follow the lexicalist/syntactic divide. While direct argumental roles and event interpretation can emerge in the nominal domain for Grimshaw, Sproat, and Marantz, it is excluded for Picallo, Borer, and Alexiadou.

And finally, with the exception of Sproat (1985) and Borer (1993), in none of these accounts is it assumed that DN terminals must include a verbal stem across the board. Regarding specifically the RN/ASN dividing line, for Grimshaw (1990), Picallo (1991) and Marantz (1997,2001) regardless of lexical or syntactic execution, the availability of ASN exclusively for deverbal (or deadjectival) derivatives is a coincidence, and there is little that would block, e.g., the representations in (77) with roots such as  $\sqrt{\text{LESSON}}$  or  $\sqrt{\text{CONCERTO}}$  with their (presumed) complements, and where the absence of a verbal instantiation is but an accidental gap.

- 77. a. \*The teacher's lesson of the students
- b. \*Sibelius' concerto of the violinist

Even more worrisome for 'verbless' accounts, however, are cases such as (78a-b), where a root may occur in both verbal and adjectival contexts, and where licit phonological nominalizations with *-ity* or *-ness* are excluded as 'verbal' ASNs with a 'verbal' event-argument array. But if the sole categorizing environment for  $\sqrt{\text{SECURE}}$  is D

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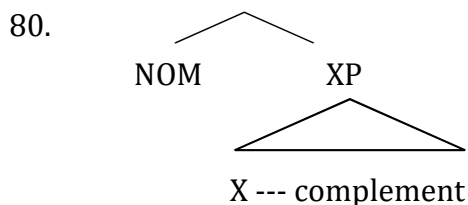
<sup>42</sup> Note that the realization of the external argument within, or outside, the verbal spine is independent of the severance of the external argument from the verbal entry (cf. Marantz 1984 and much subsequent work). If external arguments are associated with the presence of Voice (cf. Kratzer 1996 and subsequent work) the realization within or outside the verbal spine for DN becomes a question about the inclusion or exclusion of VoiceP within the scope of the nominalization, or alternatively, as in Alexiadou and Doron (2012) and much subsequent, contingent on a feature optionality built directly into the Voice node.

or even *n*, the survival of ‘verbal’ properties for *securing* or *clearance*, exactly in the context of V-selected NOMs, as opposed to their obligatory absence in the context of A-selected NOMs, cannot be explained:<sup>43</sup>

78. a. \*The soldier’s security of the gates  
 b. \*the police’s clarity of the mines
79. And compared with:  
 a. The soldier’s securing of the gates  
 b. The clearing/clearance of mines

Significantly, then, for a large class of analyses for DNs, the lexical/syntactic divide has few, if any empirical consequences, and decisions to opt for one or the other are based on more general theoretical desiderata.

Suppose we now consider the properties of the configurations in (70)-(74) relative to the claims they make, implicitly or explicitly, about Word Formation. As our starting point, consider the scheme in (80) accompanied by some mechanism capable of bringing X and NOM together, possibly head movement.



While (80) is certainly not the only scheme that can characterize word formation in the syntax, it is also clear that formally, it can only be associated with a syntactic, non-lexical operation of word formation. The reason for that is that (80) crucially involves the embedding of a non-trivial, distinctly headed maximal projection under NOM. Differently put, (80) crucially involves the presence of two non-trivial extended projections. One headed by X (a verb, a root), and the other headed by NOM, by assumption an N/*n* categorial function. Each of these extended projections comes with its own non-trivial articulated spine, containing, for the X phrase, at the very least whatever structure is associated with the emergence of arguments (minimally X'), and for N, whatever structure is typically associated with nominal spines and its complement (minimally N'), and including in all likelihood D, possibly NumP or equivalent, and whatever structure is associated with the emergence of *of*-marking. Under the assumption that non-syntactic WF trades exclusively in terminals and disallows reference to spines, any WF operation which affects X and NOM, given (80), presupposes a syntactic structure. The scheme in (80), in turn, directly characterizes the structures proposed by Picallo (1991) and by Borer (1993) for ASN.

<sup>43</sup> That DNs cannot emerge in the absence of an internal verbal constituent is particularly obvious in Semitic languages, where roots may give rise to multiple nominalization forms, but there are unique nominalization patterns for each (verbal or verbalizing) template. ASNs, as it turns out, are excluded in all nominal forms derived directly from the root without the intermediate existence of a verbal template, thereby clearly showing a verbal, rather than a root-based derivational route.

Just as clearly, (80) does not characterize either Sproat (1985), or Marantz (2001), where nominal categorization is local to  $X^0$ , and where the equivalent of  $X^0$ , a bare V for Sproat, a root for Marantz, are isolated terminals and are not associated with a functional spine. In Marantz (2001) there is only one extended projection, a nominal one. For Sproat (1985) there is a verbal projection, but a trivial one consisting of a  $V^0$  alone. The syntactic executions proposed notwithstanding, there is little that these executions accomplish which cannot be lexically managed by a pre-syntactic WF and subsequent terminal insertion/projection.

Marantz (1997) and Alexiadou (2001) present a more complex case. In both of these accounts there is a phrasal domain within which arguments are assigned, and which is headed by the root. However, the emergence of e.g., *destruction* for a root such as  $\sqrt{\text{DESTROY}}$  for these accounts does not require NOM and does not give rise to an added structural complexity, nor, arguably, are there two *distinct* extended projections in these structures. For Marantz (1997), the only extended projection is D-*n*. For Alexiadou, we have D alongside *v*. However, only *one* extended projection exists in the absence of NOM or *n*, and that extended projection is a veritably *mixed* one, in allowing  $D > \text{ASP} > v$ . Formally speaking, Alexiadou (2001) thus emerges as a case of Conversion, with the latter meant to indicate a categorial change, or categorial oscillation which does not involve added complexity. For both Marantz (1997) and Alexiadou (2001), the challenge would be to account, syntactically, for the emergence of derived verbs and the nominals correlating with them, where the a-categorial properties of a root can no longer be appealed to in giving rise, e.g., to two equally complex and derivationally unrelated *vocalize* and *vocalization* in distinct syntactic environment (see also discussion in sections 5.1 and 6).

By way of moving on, it is the scheme in (80) that has come to inform most accounts of ASNs that have emerged from the early 00s onwards, and in all such accounts, by the logic just outlined, a syntactic derivation is not just possible, it is inevitable. Emerging analyses which adopt the scheme in (80) do still differ, as we shall see, at least along the following dimensions:

- 81. A The treatment of R-nominals
- B The role of the root
- C The role of NOM/*n*
- D The properties of the pre-nominal agent/external argument in ASNs
- F The presence vs. absence of a verbal constituent within DNs
- G The internal morphological makeup of the DN-terminal
- H The appropriate syntactic representation of event arguments
- I The label/size/properties of XP in (80)
- J Additional possible restrictions on the syntactic structure of DNs.

## 5 The Syntax of DNs

Syntactic treatments of DNs in the past 20 years or so have converged on the claim that word formation, and specifically in the context of this review, derivational processes, belong in the syntax. As already noted in section 4, this claim is frequently theoretically,

rather than empirically driven, insofar as it is not always obvious that for any one account, a syntactic account yields empirically superior results. On the other hand, however, we also noted that at least *some* syntactic treatments cannot be converted into lexicalist ones, without altering substantially the nature of non-syntactic, lexical word formation as typically understood.

Beyond the theoretical claim that all combinatorial processes belong in the syntax, syntactic treatments have also converged quite strongly on the claim that the fundamental building block of (syntactic) word formation is an a-categorial root. This claim, again, is primarily theoretical, although empirical evidence can be, and has been, put forth for the syntactic representation of a-categorial roots. We note further that the syntactic treatment of word formation and postulating the fundamental building block as an a-categorial root are logically independent from each other. A-categorial roots can certainly be integrated into a non-syntactic WF component, and a syntactic account of WF is entirely viable with categorial terminals as its building blocks. Nonetheless, these two fundamental claims do share an over-riding theoretical agenda: they both constitute an attempt to eliminate formal power from the lexicon as much as possible, and relegate all formal syntactic properties, including category, and all combinatorial operations to the syntax.

The third leg of this theoretical tripod, presently known as *constructivism*, consists of eliminating from the lexicon all information concerning argument structure, under the assumption that such information is fundamentally syntactic in nature. And indeed, a host of approaches has emerged, starting from the mid-90's, which seek to sever argument structure from the properties of any one listed item and attribute it to properties of the functional syntactic structure, instead. We note that once again, severing the arguments from lexical entries does not, in and of itself, force the existence of a-categorial roots, nor does it force WF to be syntactic. Hale and Keyser (1994), whose decompositional treatment of argument structure and verbal entries is at the foundation of many subsequent efforts to sever argumental information from lexical entries, viewed their agenda as an elaboration of lexical structure, a perspective that is shared by the highly compositional approach to argument structure realization in Ramchand (2008), where lexical terminals are not even necessarily present as such. <sup>44</sup>

In view of the logical, if not conceptual, independence of the factors above, it is not surprising that *constructivist* accounts have not converged on the claim that argument structure is fully severed from the listed entry. As categorial entries no longer exist, however, the lack of convergence focuses, rather, on the availability of arguments for

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<sup>44</sup> Some contingencies do exist, however. As we already noted, if nominalization occurs outside the domain of argument-structure realization, it is per force syntactic; similarly, if argument structure is severed from the lexical entry and is assigned by the structure, argument structure alternations could not be defined as operations on lexical entries and must be syntactic, as are all nominalization that includes them.

the root, as well as on the factors that may determine the availability of such arguments.<sup>45</sup>

Other differences exist as well, some concerning issues that are independent of properties of DNs as such. Among the latter, different executions appeal to distinct functional structures, both within the nominal and the verbal domain, impacting, potentially, the distribution of modifiers and arguments or the assignment of case within ASNs, with the result that movement is at times required for case assignment, which may cross the nominal/verbal divide.

As already noted, analyses also differ on whether DNs per force include a verbal projection, on the structure of R-nominals, and on the status of the external argument in ASNs. Finally, accounts may differ on whether restrictions may be attested on the verbal spine within ASNs which differentiate it from propositional verbal spines, with case assignment and passive as prime examples.

A full review of the broad array of analyses is not possible, nor have I attempted here to incorporate the important cross-linguistic analyses of DNs in general and ASN in particular, that have come to light since Grimshaw (1990), and which includes, at the very least, Romance (Catalan, French, Italian, Portuguese, Rumanian, Spanish), Germanic (Dutch, German, Icelandic, Norwegian, Swedish), Slavic (Polish, Russian, Bulgarian, Serbian), Greek, Finnish, Hungarian, Turkish, Korean, Japanese, Semitic (Hebrew, Arabic), Mandarin, and Mayan (Ch'ol and Chuj).<sup>46</sup> Below, I will restrict myself to three important foci:

- A Nominalizations without a verbal spine
- B The verbal spine in ASN
- C R-nominals: derivation and non-compositional Content.

### ***5.1 Nominalization without a Verbal Spine: Harley (2009a), (2014), i.a.***

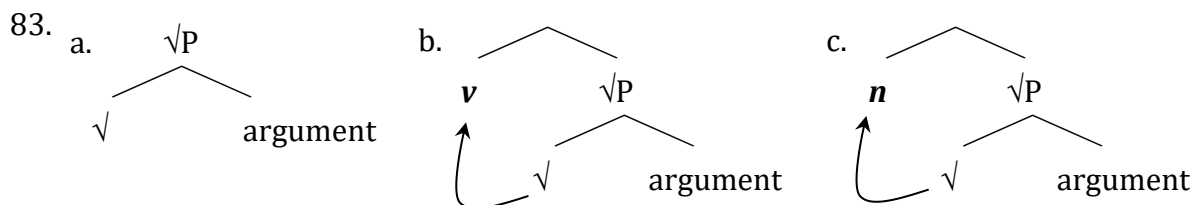
In a series of influential studies, Harley (2009a, 2014a,b i.a.) proposes an analysis of word formation in general and DN in particular that expands and elaborates on Marantz (1997), itself as already noted a close syntactic execution of Chomsky (1970) with the structures in (71), repeated here as (82):

82. a. [D (the army) [<sub>√P</sub> √DESTROY the radio station ] ] Marantz (1997)  
       b. [<sub>V-1</sub> the army [<sub>√P</sub> √DESTROY the radio station ] ]

<sup>45</sup> In maintaining that lexical entries are a-categorical but may nonetheless have arguments such accounts track, exactly, the original claim in Chomsky (1970).

<sup>46</sup> Cross-linguistic investigations of nominalizations are, in fact, considerably more extensive than this list suggests. However, as noted already in the introduction, this review has limited its scope to nominalization of non-clausal structures, thereby excluding all nominalizations that scope over grammatical aspect, modality, or tense. Included, on the other hand, are nominalizations which scope over 'inner aspect' in the sense of Travis (2010) as well as other grammatical structure which is involved in the determination of argument structure. As such, English gerunds are excluded, as are many important cross-linguistic constructions which clearly do contain higher propositional material.

The important aspects of (71), which Harley adopts, include the claim that the internal argument is specifically an argument of the *root* and is realized as its sister, and that there exists a syntactic maximal projection headed by the root, which includes the root and its complement,  $\sqrt{P}$ , as in (83a). (83a) may now be embedded under **v** or under **n**, by assumption categorial nodes, with subsequent movement of  $\sqrt{}$  to **v/n**, to give rise to (83b) and (83c):

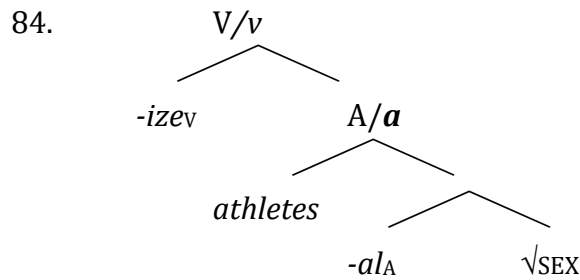


In fact, Harley (2014a,b) goes even further by assuming that the selection of an argument is, in and of itself, the sole robust characteristic of roots, whose Content and phonology may be variable, and determined contextually through mechanisms of late insertion. It is worthwhile noting that while Harley (2009a, 2014a,b) makes use of the categorizing nodes **n**, **v**, originally from Marantz (2001), her categorization domain scopes over the entire role-assignment domain, and not just over the root, as in Marantz (2001).

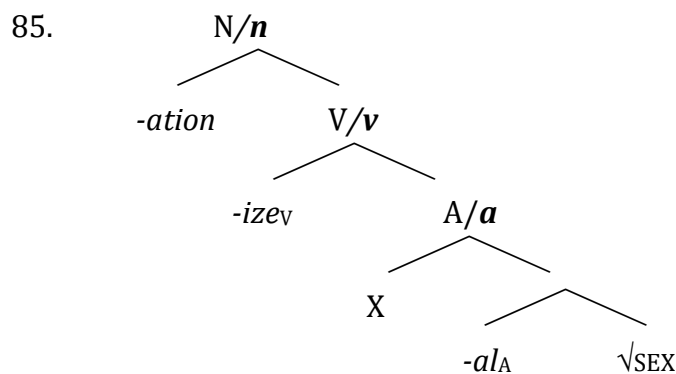
A few drawbacks of the approach guiding (83a-c) were already noted in section 4, in the context of Marantz (1997). The structures in (83) have the advantage that the root-complement-constituent occurs uniformly across all categorized instantiations of the root, but that, in turn, may also be a disadvantage. First, with the  $\sqrt{P}$  in (83a) occurring uniformly across the board, there is no way to capture, with these structures, the distinction between ASNs and RNs (I return in section 6 to Harley's perspective on RN). Second, as in Chomsky (1970) (as well as Marantz, 1997, 2001 and Picallo, 1991 at the very least) the nominal and the verbal structures are equally complex, and the nominal instantiation does not contain a verbal spine. The morphological difficulties of that claim were already touched upon in section 4, and I return to them in the context of R-nominals, where suggestions that nominalizations are formed without the need for an intermediate verbal constituent are considerably more prevalent.

A larger inconsistency lurks here, however, once we pause to evaluate derived verbs (e.g., *sexualize*), where internal arguments cannot possibly be held to merge, across the board, as sisters of the root. To wit, the claim that in e.g., *the media sexualizes athletes*, 'athletes' is the complement of the root  $\sqrt{\text{SEX}}$  is patently absurd, all the more so as the form *sexualize* is entirely compositional, and *athletes* is very clearly the argument associated with *sexual*, itself composed of the noun/root  $\sqrt{\text{SEX}}$ , rendered adjectival, and thereby acquiring an argument, and then verbalized with *-ize* to yield the meaning of *make/become sexual*. A simplified structure, excluding functional nodes, is in (84):





If, however, some grammatical mechanism must be in place which allows a complement to merge well above the domain of the root for *sexual* or *sexualize*, it is not clear that there is any theoretical advantage to ever postulating an argument which merges directly with the root. Even more gravely, an argument of  $\sqrt{\text{SEX}}$ , obligatorily present for Harley (2014a,b) would need to be suppressed in (84). The difficulty ameliorates once we consider a compositional DN such as *sexualization*, which easily occurs as an ASN (*the sexualization of athletes by the media*). Given (84), *sexualization* must be derived from *sexualize*, and cannot be modeled as a parallel derivation  $v/n$  derivation, as is the case for the root-derived  $v$  and  $n$  in (83b-c):



It would thus appear that while for Harley (op. cit.) some ASNs could emerge from a direct merge of NOM/ $n$  with a category neutral  $\sqrt{P}$ , and with equal complexity for the verbal and the nominal instantiations, others *must* be derived from a categorized verbal source, where arguments for the root are irrelevant (if present) and create a structure that is *per force* more complex than the correlating verbal instantiation and is a phonological superset of it. The matter, we note, is not a conceptual one, but an empirical one – there is (to the best of my knowledge) little if any evidence to suggest that the syntactic properties of *the sexualization of athletes by the media* are different from those of *the abuse of the athletes by the media*, or *the treatment of athletes by the media*, both, presumably, root-derived for Harley.<sup>47</sup>

It is worthwhile noting before moving on, that to the extent that some researchers hold that roots are semantically implicated in the selection of complements (most recently

<sup>47</sup> The difficulty associated with the existence of structures such as (84) is explicitly acknowledged in Harley (2009b), a matter I touch upon briefly in section 6. However, Harley nonetheless shies away from providing a uniform representation for arguments that would eliminate the unnecessary duality here. The reader is referred to Harley (2014a,b) and the accompanying commentary for more discussion of this matter.

and explicitly, Rappaport Hovav 2016. As an illustration, see discussion of Iordăchioaia, 2020 in section 3.3.4), that potential route is not actually available to Harley (op. cit.), who explicitly assumes that roots *do not* have fixed semantics which may impact the properties of their complements.

## 5.2 The verbal spine in ASN

### 5.2.1. Different syntax/semantics for event structure → differing verbal spines within ASN

While the motivation for differing accounts of event structure is typically based on a broader context, these do impact claims on the structure of DNs. We already saw a direct illustration of this in the discussion of Harley's (2014a) approach. To exemplify within 'verbal' (rather than root-based) approaches, Sichel (2010) suggests that ASN-*atk* are nominalizations of *simple, single events*, while ASN-*ing* are nominalizations of *complex events*. Empirically, the account is based on restrictions on nominalizations of verbs which enter the causative/inchoative alternation, and with the contrast in (86), originally from Chomsky (1970), as a prime example:<sup>48</sup>

- |        |                             |                                  |
|--------|-----------------------------|----------------------------------|
| 86. a. | the growth of the tomatoes  | intransitive only                |
| b.     | the growing of the tomatoes | both transitive and intransitive |

The contrast, variably attributed in the literature to lexical semantics or to morphological factors, can be accounted for, Sichel proposes, if we assume a notion of event complexity which is defined in terms of co-temporality between the participation of the external argument, and the initiation of the event. In a simple (single) event, the participation of the external argument is co-temporaneous with the initiation of the event. Such events allow for ASN-*atk* realizations (in our terminology). Conversely, when the participation of the external argument is not co-temporaneous with the initiation of the event, the event is complex, and may only be nominalized (in English) as ASN-*ing*. The reader is referred to Sichel (op. cit.) for the detailed argumentation, with the particular focus here being the way in which specific claims about the syntax/semantics modelling of event structure may impact, or be impacted, by the properties of ASNs. Clearly, in an approach to argument structure which does not assume the co-temporality restriction, the generalization, if judged valid, could not be thus stated, and in fact, in e.g., Ramchand's (2008) modelling of event structure, it is not clear it *can* be stated without introducing additional restrictions on the syntax of event structure. In turn, approaches which do assume event structure of the Ramchand-type, allow for different portions of the verbal spine within nominals which could yield, potentially, [*n/N initP*]; [*n/N processP*]; or [*n/N resultP*], all nodes in the Ramchandian verbal sequence. For explicit executions along such lines, see Sleeman and Brito (2010) as well as Bašić (2010), i.a.

### 5.2.2 External arguments?

As we shall see shortly, the portion of the verbal spine that enters nominalization is crucial in accounting for the emergence of a more fine-grained account of ASNs cross-linguistically, as well as to the account of R-nominals. Such accounts do differ

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<sup>48</sup> See, in particular, Pesetsky (1995), Marantz (1997), Harley and Noyer (2000) and Borer (2003) for some relevant perspectives.

conceptually and theoretically from a host of claims according to which some properties of the verbal spine embedded under NOM are *in principle* different from those attested for the verbal spine under, e.g., T. The majority of the latter claims concern the external argument. It would be appropriate to start their discussion by noting that Grimshaw (1990) explicitly assumes that NOM has passive-like properties in suppressing the realization of the external argument. Possibly the closest correlate of this claim is Alexiadou (2001), who argues that nominalizations are inherently ‘ergative’, which is to say, are restricted to configurations which exclude the external argument. In subsequent treatments, Alexiadou (2017, 2020) does allow the verbal spine under NOM to correlate to verbal passive for ASN-*ing*, adopting specifically the analysis in Bruening (2013) which allows the external argument either as an explicit *by*-phrase, or as a null pronominal in Spec,DP. Active transitive instantiations, as well as unergative nominalizations, however, are still excluded across the board.

Unergative nominalizations do turn out to either be altogether missing in some languages, as in Greek, discussed in Alexiadou (2001), or, at times, to occur without nominalizing affixes, or to the exclusion of ASN readings, as in Catalan, discussed in Picallo (1991), leading Picallo (1991) to propose that ASNs are always passive.<sup>49</sup> The degree to which the restriction is, however, a universal one is not obvious. For instance, Ehrlich and Rapp (1999) as well as Ehrlich (2002) report that while intransitive nominals in German favour a patient construal, an agentive, unergative construal is forced whenever a patient construal is implausible. Some illustrations are in (87):

87. a. Die Vernehmung des Richters  
the interrogation (of.the) judge  
‘the interrogation by the judge’  
b. Die Befragung der Polizei  
the questioning (of.the) police  
‘the questioning by the police’  
c. Die Beobachtung des Astronomen  
the observation (of.the) astronomers  
‘the observation by the astronomers’  
d. Die Durchsuchung der Zöllner  
the searching (of.the) customs  
‘the searching by the custom [officer]’

Similar cases are reported in Rozwadowska (1991; 1995; 1997) for Polish; Schoorlemmer (1995; 1998a; 1998b) for Russian; and Borer 2013b for Hebrew (see Rozwadowska 2006, 2017 for a review). Note, as well, the corpus cases in English in (88), (modification added by way of diagnostics):

88. the [*deliberate*] jumping of click-beetles  
the dancing of the sun [*for several months*]  
the pumping of the heart [*for the duration of one’s lifetime*]  
the [*deliberate, heavy*] breathing of killers

<sup>49</sup> And see Alexiadou (2001, 2017) for more cross-linguistic evidence.

A more nuanced approach to external arguments in ASNs, which nonetheless follows the spirit of Grimshaw's (1990) original suggestion is in Bruening (2013). Bruening (2013) allows for a straightforward passive verbal spine within ASNs, which tallies exactly the properties he otherwise proposes for propositional passive, and with the external argument realized, within the verbal spine, as a *by*-phrase. For an active derivation, however, Bruening (2013) proposes that the external argument merges directly in [Spec,NOM], because NOM, in ASNs but not otherwise, requires that all arguments of the verbal projection be saturated, and projects the external argument as PRO in its specifier if they are not. The claims in both Bruening (2013) and Alexiadou (2017) thereby hark back to the original claim in Grimshaw (1990), according to which NOM's function is passive-like, in suppressing the direct realization of the external argument. Both attribute to ASNs an array of properties not otherwise attested, as such, in propositional VP contexts.

By contrast, Borer (1993, 2013b, 2020) argues that the distribution of external arguments within DNs is in essence identical to that attested within nominals, and their availability, or lack thereof, are contingent on language specific case marking possibilities. In English, to illustrate, genitive is available both pre-nominally and post-nominally, thereby allowing the occurrence of two arguments, with the higher one requiring movement to Spec,DP to be case marked. In German and Romance (and barring exceptional clitics or specialized DPs), only one post-nominal genitive case is available, thereby forcing either an activity reading, as in (87), or alternatively, a passive derivation, broadly speaking along identical lines to that of passive within propositional VPs, in which, per force, only one case is necessary. Finally, in Hebrew, two case positions are available post-nominally: one genitive and the other objective, thereby allowing the transitive case in (89):

89. ha.hafgaza    **šel** ha.matos    **'et**    ha.3ir  
       the.bombing of the.plane OM the.city    (OM=Object Marker)  
       'the plane's bombing of the city'

Passive may still apply to the DN in (89), resulting in (90a). Crucially, and by way of providing strong support for the passive analysis, Borer (1993, 2013b) highlights the fact that absent an external argument, or when the external argument is realized through the Hebrew equivalent of a *by* phrase, the Object Marker *'et* is no longer possible, and the internal argument must be genitive-marked with *šel*. No such loss of marking is attested with PP complements (cf. 91). As such, the paradigm is not only an argument for passive, but also for the promotion of the internal argument to a higher position, where *šel* marking is otherwise available:

90. a.    ha.hafgaza    **šel** ha.3ir            (**3al yedey** ha.matos)  
           the.bombing of the.city        (by            the.plane)  
           'the bombing of the city (by the plane)'  
       b.    \*ha.hafgaza    **'et** ha.3ir            (**3al yedey** ha.matos)  
           the.bombing OM the.city        (by            the.plane)

91. a. ha.nexita      šel ha.matos      3al ha.xof  
the.landing      of the.plane      on the.beach  
'the plane's landing on the beach'
- b. ha.nexita      3al ha.xof      (?3al yedey ha.matos)  
the.landing      on the.beach      (?by the.plane)  
'the landing on the beach (?by the plane)
- c. \*ha.nexita      šel ha.xof      (3al yedey ha.matos)  
the.landing      of the.beach      (by the.plane)  
'\*the landing of the beach (by the plane)'

Analyses which postulate an external argument and veritable passive within DN have been further put forth at the very least by Engelhardt and Trugman (1998a,b) for Russian; in Fu, Roeper and Borer (2001), and in van Hout, Kamiya and Roeper (2013), i.a.<sup>50</sup> A particularly strong argument for the availability of not only passive, but also passive-like argumental promotion within DN is mounted in van Hout, Kamiya & Roeper (2013). Their account concerns scope effects for de-adjectival nominals derived from -able adjectives, which they view as a form of passive. Thus consider (92):

92. The electability of *nobody* surprised me
- a. ??I am surprised that nobody was electable      (??narrow scope)
- b. Nobody is such that his electability surprised me      (√wide scope)

As van Hout, Kamiya & Roeper (2013) note, *nobody* in (92) must receive a matrix scope and cannot scope under *surprise*. Returning to the realm of deverbal ASNs, we note that identical effects hold when *nobody* is the external argument, including unergative cases:

93. a. Nobody's rejection of the offer surprised me (✗narrow /√wide)
- b. The disobedience/rebellion of *nobody* surprised me (✗narrow/√wide)

The converse effects hold for objects when the external argument is overt. Here, only narrow scope is licit:

94. The council's election/electing of *nobody* surprised me (√narrow/✗wide)

Strikingly, when an overt external argument is missing, we get an ambiguity:

95. The election/electing of *nobody* surprised me (√narrow/√wide)

As van Hout, Kamiya & Roeper (2013) note, the ambiguity of (95) follows if we assume that the sole overt argument in (95) has moved from the object position to a higher, subject or subject-like position. The wide scope reading is now computed on the basis of its post-movement position, while the narrow scope reading results from reconstruction. Otherwise put, this scope configuration emerges if, and only if, we assume a passive-like movement of the internal argument, possible only when the external argument is suppressed.

<sup>50</sup> See Rozwadowska (2006, 2017) for a fuller review.

Additional confirmation comes from the ambiguity of unaccusative ASNs, as in (96), compatible, again, with the computation of scope on the basis of movement and reconstruction:

96. The arrival of nobody surprised me (√<sub>narrow</sub> /√<sub>wide</sub>)

Finally, the contrast between (95) and the gerund in (97) provides evidence against the claim (most recently in Sichel, 2009 and Bruening, 2013) that ASNs which lack an overt subject involve a PRO/*pro* external argument in Spec,DP or Spec,NOM. If that were the case, the contrast with the obligatorily narrow scope for the object in gerunds would become inexplicable.

97. Electing nobody surprises me (√<sub>narrow</sub> /✗<sub>wide</sub>)

Before proceeding to our next topic, we note that the presence vs. absence of an external argument within ASN is logically distinct from the availability of movement of an argument from within the verbal spine to the nominal spine, to occupy either Spec,DP or some lower nominal specifier. Clearly, if one subscribes to the view that there is no external argument within the verbal domain of ASN, that argument cannot have moved to Spec,DP in ‘transitive’ ASN instantiations such as *the enemy’s destruction of the city*. However, this leaves untouched the possibility that the *internal* argument, by all accounts available within the verbal spine, may move to some nominal specifier, to yield (98a) in English, or, for that matter, to give rise to prepositional genitive marking in a low nominal specifier for the Hebrew cases in (90a), or, potentially, English (98b) with the structure in (99) put forth in Fu, Roeper, and Borer (2001) and Borer (2013b):

- 98. a. The city’s destruction (in 2 hours/in order to punish the population)
- b. The destruction of the city (in 2 hours/in order to punish the population)

99. [<sub>D</sub> The destruction [<sub>FN1</sub> of the city [<sub>FN2</sub> <destruction>.. [<sub>FVn</sub> <city> [<sub>FVn+x</sub> <destroy> ]]]]]

What is at stake here are two differing claims. One is the view in Grimshaw (1990), according to which the pre-nominal position in English never hosts true event arguments. That view would exclude not only a veritable external argument in that position, but an internal one as well. The second view is that external arguments as such are not available within the domain of NOM, but movement of arguments from within the event complex to the nominal one is licit. The latter is, in fact Alexiadou’s view, who has explicitly challenged the claim in Grimshaw (1990), that DNs such as (98a) are not ASNs (and see also Doron and Rappaport Hovav 1991).<sup>51</sup>

### 5.2.3 The size of the verbal spine and ASNs variability

The previous discussion already sporadically referred to analyses which attribute more fine-grained properties of ASNs to the varying size of the verbal spine embedded within them, however otherwise characterized. Such analyses frequently, although not across the board, correlate the size of the embedded verbal spine with the realization of the

<sup>51</sup> As is well known at least beginning with M. Anderson (1977), movement of internal arguments to the prenominal position is associated with affectedness restrictions. The matter is set aside here for reasons of space.



nominal affix.<sup>52</sup> An early such instantiation is in Marantz (2001), where it is assumed that DN-*ing* involves NOM merging with *v* while DN-*atk* involves a direct merger of NOM with the root. A more recent instantiation of that very same idea is in Alexiadou (2017), who suggests that ASN-*ing* contains Voice (thereby allowing passive), but ASN-*atk* does not. As we shall see, the claim informs almost all present-day approaches to the distinction between ASN and RN. Restricting our attention here to ASNs alone, a particularly compelling case for the need for varying the size of the verbal spine and for the correlation between the size of the verbal spine and NOM realization comes from Polish, as discussed by Rozwadowska (1995; 1997; 2002). As Rozwadowska shows, Polish has two types of ASNs. The first, marked by the occurrence of the productive suffix *-nie/-cie*, appears as both perfective and imperfective, with the former marked overtly through the presence of perfective prefixes, and with the latter marked by their absence, as illustrated in (100-101). While it has been argued the *nie/-cie* nominal type corresponds to gerunds, Rozwadowska shows that crucial verbal properties, and significantly, accusative case assignment to internal arguments, are not available, making the conclusion that they are gerunds untenable.

100. **Perfective**

- a. **Napisanie** dobrego artykułu przez studenta w tydzień nie jest łatwe  
writing<sub>PFV</sub> good<sub>GEN</sub> paper<sub>GEN</sub> by student<sub>ACC</sub> in week not is easy  
'Writing a good paper by a student in a week is not easy.'
- b. **Ocenienie** studentów przez nauczycieli nastąpiło natychmiast.  
evaluation<sub>PFV</sub> students<sub>GEN</sub> by teachers<sub>ACC</sub> happened immediately  
'The evaluation of the students by the teachers took place immediately.'

101. **Imperfective:**

- a. **Pisanie** tego rozdziału trwało kilka miesięcy.  
writing<sub>IMPFV</sub> this<sub>GEN</sub> chapter<sub>GEN</sub> lasted a few months  
'Writing this chapter lasted a few months.'
- b. **Ocenianie** studentów przez nauczycieli ciągnęło się przez ] cały tydzień  
evaluation<sub>IMPFV</sub> students<sub>GEN</sub> by teachers<sub>ACC</sub> continued for whole week  
'The evaluation of the students by the teachers continued for the whole week.'

The second ASN type allows for a broad range of nominal affixes, potentially root selected, and is aspectually neutral, with no overt marking of the perfective/imperfective distinction and with the aspectual interpretation contextually determined, and tallying with the construal of the relevant event as activity or an accomplishment. These are illustrated in (102) (note that ACC here is associated with the object of the P-*przez*, effectively *by*, whose complement is the external argument, not the internal one):

<sup>52</sup> While Sichel (2010) correlates the single event vs. complex event instantiations with ASN-*ing* and ASN-*atk* respectively, it is not clear that what is at stake for her is the size of the verbal spine, rather than the nature of the relationship which holds between its parts.

102. a. Ocena studentów przez nauczycieli nastąpiła natychmiast.  
 evaluation students<sub>GEN</sub> by teachers<sub>ACC</sub> happened immediately  
 'The evaluation of the students by the teachers took place immediately.'
- b. Ocena studentów przez nauczycieli ciągnęła się przez cały tydzień  
 evaluation students<sub>GEN</sub> by teachers<sub>ACC</sub> continued for whole week  
 'The evaluation of the students by the teachers continued for a whole week.'
- c. Obserwacja nowego zjawiska przez uczonych trwała 5 lat  
 observation new<sub>GEN</sub> phenomenon<sub>GEN</sub> by scientists<sub>ACC</sub> lasted 5 years  
 'The observation of a new phenomenon by the scientists lasted 5 years.'

While varying executions may capture the perfective/imperfective distinction in Polish (and Slavic) differently, under the assumption that it *is* syntactic in nature, an obvious approach to the emergence of two nominal patterns in Polish would follow if we allowed the size of the verbal spine embedded under NOM to differ, and with *nie/cie* nominals scoping over the functional structure responsible for the emergence of the perfective/imperfective distinction, and with other instantiations of NOM excluding it.

In addition to illustrating the existence of two ASN formation strategies within a single language embedding distinct-size spines and with different realizations of NOM, note, the Polish situation speaks to another important generalization which correlates the size of the verbal spine with the regularity of the nominal affix, or more specifically, the association of a 'default' instantiation of NOM with a larger verbal constituent.<sup>53</sup>

#### 5.2.4. *Interim Conclusions*

The differences between approaches to ASNs which do include a verbal spine fundamentally hark back to the following issues:

- A The appropriate representation of (the relevant portions of) the verbal spine. By definition, and very much following Chomsky (1970), we have restricted our attention to studies of DNs which exclude T, grammatical aspect, modality, and negation. Beyond that, such accounts do not always agree on what the verbal spine, in general, may consist of, or what is the best syntactic characterization of argument structure.

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<sup>53</sup> The generalization is frequently cast in terms of root selection, with idiosyncratic realizations of NOM occurring sufficiently close to the root for the latter to exercise root selection, and with general realizations reverting to default. However, the matter is clearly more complex, insofar as e.g., English NOM-*atk* is at times root selected (*commission*, alongside *committal* and *commitment*) but with *-ation* occurring entirely predictably in the context of verbs derived with *-ize*, *-ify*, and *-ate*, and *-ment* in the context of prefixed verbs. Therefore, a clear-cut root-selected distinction between NOM-*atk* and NOM-*ing* appears difficult to support across the board. Note that another potential generalization in English would associate NOM-*atk* with level I (+ boundary) morphology, and NOM-*ing* with level II(# boundary) morphology. However, the implications of level morphology for the syntactic derivation of complex words remain unclear, at best. The reader is referred to Plag (1999), Marvin (2003), Embick (2010), Lowenstamm (2014), and Borer (2013b, 2021), i.a., for some discussion of these issues, and to the conclusion of this review for some methodological suggestions.

- B Assuming a verbal spine with a specified set of functional nodes, are there restrictions on what may or may not be included under NOM, in order for a well-formed DN to emerge? We saw that embedding differently specified spines is a possibility, but that according to some approaches, transitive Voice, for example, is excluded. The question extends to the structure of RNs, where, as we shall see, multiple approaches assume that RN involve the merger of a nominalizing affix with a bare V, while others exclude it. Beyond that, however, can *any* subset of the verbal spine give rise to a well-formed DN with some appropriate interpretation, as might be implied by executions which take as their starting point the articulated verbal spine in Ramchand (2008)?
- C Crucially, do partial verbal spines contained within DN obey restrictions on truncation, and is such truncation, even if restricted, bottom up or top down? Specifically, given a fixed, ordered functional sequence such as (103A), are partial inclusions within the domain of NOM restricted to the combinations listed in (103b) (bottom-up sequencing), the combinations in (103c) (top-down sequencing) or are the representations in (103d) possible spines under NOM, with some functional nodes specifically targeted for elimination?
103. A. F1>F2>F3>F4  
       B. F4; F3>F4; F2>F3>F4; F1>F2>F3>F4  
       C. F1; F1>F2; F1>F2>F3; F1>F2>F3>F4  
       D. F1>F4; F2>F4 etc.

At least some *prima facie* evidence favoring a bottom-up sequencing comes from the observations cited already in Ehrlich and Rapp (1999) and Ehrlich (2002) relative to the German paradigm in (87), that an object construal, if available, is favored. (103B) would be capable of capturing this preference, but not so (103C, D) under the common assumption that the object is realized is the lower end of the verbal spine, and certainly below the realization of the external argument. *Prima facie* evidence favoring (103C), on the other hand, would be the fact that in transitive nominalizations in English which are contextually amenable to such construals, both accomplishment and activity readings are available (*the production of the shoes in/for*), a situation that is hard to build into bottom-up sequencing if we assume that result is embedded under activity (e.g. as in Ramchand 2008, among many others). Finally, note that if Voice (or any other node which licenses the external argument) is higher than whatever node is responsible for the perfective/imperfective marking in Polish, (103B) would force us to assume that Voice is perforce absent in type 2 ASNs in Polish, but may be present in type 1 nominals. More intriguingly, and assuming (103B), if the verbal spine under NOM excludes whatever structure licenses accusative case, as is commonly assumed, and if one assumes that ACC-associated structure is below Voice, would the absence of ACC in ASN force the exclusion of Voice? Or, with (103C) in mind, would the absence of ACC force us into an unergative, activity pattern across the board? The facts, it would appear, do not support a straightforward contingency between the absence of ACC in ASNs and the absence of Voice, or between the absence of ACC and the emergence of an unergative pattern thereby providing indirect support for (103D), which is to say, for the potential omission of some functional nodes within ASN which do not obey a strict

expanding or contracting sequence. Resting this issue, I note that there are clearly non-trivial questions to pursue when it comes to modelling the properties of partial verbal spines within ASNs, as well as universally.

## 6 R-Nominals

### 6.1. Prologue

We noted in passing that many early syntactic approaches to DN (including at the very least Sproat, 1985, Picallo, 1991, Valois, 1991 and Borer, 1993) assumed that while ASNs are syntactic, RNs are not, thereby leaving in place the bifurcation between syntactic combinatory operations and non-syntactic ones, with the latter at the very least possibly, if not necessarily, pre-syntactic.<sup>54</sup>

Before turning to more contemporary syntactic accounts for the difference between ASNs and RNs, we pause to comment briefly on the logic of a non-syntactic treatment for R-nominals in the early 90's on the part of approaches that do endorse a syntactic treatment of ASNs. The reason for the bifurcation, I believe, is that within the set of theoretical assumptions prevalent at the time, a syntactic derivation for RN would have encountered insurmountable theoretical difficulties not encountered by a syntactic analysis of ASN, in needing to challenge the X'-schemata and crucial assumptions built into it about complementation and argument structure. Note, specifically, that if, as X'-theory would have it, X<sup>0</sup> is ill-formed unless embedded under X' and X'', and if selected complements must be realized as sisters of the selecting head, it is clear that a bare V<sup>0</sup> divorced from its complements is not a syntactic option. Specifically, the starting point for embedding a verb such as *destroy* within a syntactic structure would be as in (104), where the complement of V<sup>0</sup> is realized as its sister (and setting aside the external argument). (105a-b), in turn, are ungrammatical, because (105a) is in violation of the obligatoriness of lexically selected complements to project as sisters of V, and (105b) is in violation of X'-theory (as well as the insertion frame of *destroy* which requires an internal arguments):<sup>55</sup>

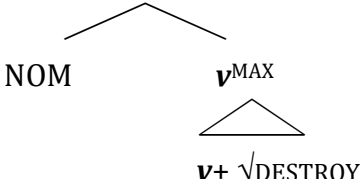
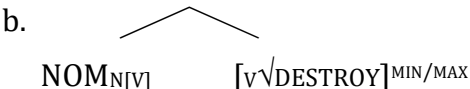
<sup>54</sup> While for Sproat (1985) RN are fundamentally listed entries, both Picallo (1991) and Borer (1993) assume a formal distinction between syntactic and morphological operations. Appealing to Borer (1984b), Picallo (1991) assumes that NOM has an inflectional realization which is syntactically available to give rise to ASN, alongside a categorial derivational one that is only available within a non-syntactic WF component, and which gives rise to RN. Borer (1993) assumes an autonomous WF component which operates identically parallel to the derivation, and which can take as its input either lexical terminals pulled out of a lexical reservoir, or two terminals within a syntactic tree, provided their structural representation matches well-defined locality conditions. While the former, per force, excludes arguments, the latter, just as necessarily, includes them. Fundamental to that execution, but not others (including Borer, 2003, 2013b), is the claim that the rule which combines NOM with V operates on fully identical input across its instantiations, thereby accounting for the identity of the realization of NOM in these two disparate contexts.

<sup>55</sup> Sproat (1985) translates the complementation requirement to a set of saturation conditions on theta grids, realized, in his system, through the nominal projection, thereby allowing him to embed V<sup>0</sup> directly under N. His representation therefore accounts for the absence of direct verbal arguments. His account remains, nonetheless, a violation of X'-theory. Beginning with Travis (1984), it is frequently

104. T [v'' [v' [v<sup>0</sup> destroy] the city] ]
105. a. \*T [v'' [v' [v<sup>0</sup> destroy]] ]  
b. \*T [v<sup>0</sup> destroy]

Chomsky (1970), in addressing the failure of symmetry in complementation between N and V, suggests that arguments are optional in nominal contexts. But for syntactic views which endorse the ASN/RN division, and which assume either a root phrase that selects a complement identically across the board, or a VP embedded under NOM for ASN, that option is no longer available. By assumption, all event arguments are either obligatory, giving rises to ASNs, or missing altogether, giving rise to RNs. Accommodating R-nominals syntactically within this set of assumptions is thus a considerable challenge.<sup>56</sup>

Two developments associated with the 90's had the effect of removing these difficulties, thereby opening the door for the integration of R-nominals (and multiple other WF operations) into the syntax. The first is the replacement of the X'-scheme by Bare Phrase Structure (cf. Chomsky, 1995a and subsequent), with its relativized approach to maximal projections. The second, noted already (see section 4), is the emergence of multiple accounts from roughly 1992 onwards, which involve the migration of argumental roles from the domain of the lexical projection (complement of V, specifier of V) to some functional domain. While the claim that external arguments are not realized within the domain of some selecting head regained traction especially with Kratzer (1996), more crucial for the treatment of R-nominals are representations which remove the *internal* argument from the complementation domain, lodging it, rather, in some functional specifier within the verbal spine. Both these assumptions have directly resulted in (106a-c) now emerging as fully syntactically licit:

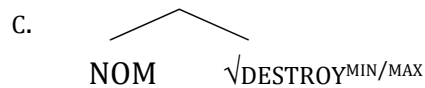
106. a. 
- b. 

assumed that syntactic word formation is accomplished through head movement, which allows the syntactic combination of two X<sup>0</sup> items. The difficulties with (105), however, are not shared by head movement accounts, as head movement involves a full X'' projection with all complements realized, to be followed by the displacement of X<sup>0</sup>.

<sup>56</sup> An additional X'-theoretic challenge faced both RNs and ASNs, insofar as complements were, and still frequently are, assumed to be lexically selected, and with lexical selection driven by *semantic* considerations (Chomsky, 1981, 1986, Pesetsky, 1982, and much subsequent). It is hard to see, however, why NOM, by assumption no more than a vacuous categorial marker, should *semantically* select a verbal spine as its complement, all the more so as the structure [N [ VP]] in English with N as a fully realized noun is not attested, and where e.g., [N [TP ...VP]] would give rise to either a purpose relative clause (*a man to fix the sink*), or, possibly, to a Complex NP, neither of which share the properties of ASNs.

In turn, the development of extended complex functional sequences has driven home the theoretical futility of attempting to reduce all sisterhood relationship to semantic selection, thereby also removing one more hurdle for the integration of word formation into the syntax, and for the establishment of *categorial selection relations* which do not appeal to semantics (e.g., categorial selection such as NOM, as a label, selecting V, as a label), originally proposed in the context of non-syntactic morphology by Lieber (1980).





d.  $[_D D [_F F [_{\sqrt{P}} \sqrt{\text{ROOT}} \text{DP}]]]$  slightly modified from Alexiadou (2001) p. 57

The difference between (106a) and (106b) rests on the difference between the categorization system employed in DM, as in (106a), where  $v$  merges with the root giving rise to a (complex) verbal constituent, and the categorization system in the XS-model (Borer 2003, 2005a,b, De Belder 2011 i.a.), where NOM is by assumption a functor which projects N and defines its complement as V (N[V]), and as such, possibly an instantiation of min/max. The consequences of these different categorization systems are by and large orthogonal to the discussion here and are therefore set aside. Crucially, (106a-b) share the claim that there is a veritable verbal head embedded within R-nominals. Not so (106c) which involves a direct merge of NOM with the root, and with the structure of e.g., *destruction* identical to that of (underived)  $[_n n \sqrt{\text{CAT}}]$ . There is, specifically, nothing in the structure to suggest that a verbal stem may be part of the resulting form, and as such, the form is neither deverbal, nor, in fact, a derived nominal, strictly speaking. A variant of (106c), (106d), is proposed in Alexiadou (2001), in which NOM, as such, is absent, and the root is categorized by D, very much on a par with the structure for ASN already discussed in section 4, but crucially missing an aspectual node.

These structures go a long way toward describing the inventory of contemporary approaches to R-Nominals. Another approach does, however, exist, which in spirit is considerably more akin to earlier accounts of DN, in seeking to model R-nominals as cases in which otherwise obligatory arguments have been suppressed, or existentially bound. I briefly turn to one such account below.

With primarily the structures in (106) in mind, two issues have occupied attention in the ongoing literature on RNs. The first concerns the availability, or lack thereof, of a verbal spine, however minimal, within R-nominals, or, more specifically, the choice between (106a-b) on the one hand, and (106c-d) on the other hand. The second concerns the emergence for R-nominals, but not for AS-nominals, of non-compositional, listed readings.

## 6.2 Direct merge with the root?

The claim that R-nominals do not require any portion of the verbal spine, however minimal, harks back to root-based approaches to DNs which do not postulate a verbal spine altogether, first and foremost in Chomsky (1970), and subsequently in Marantz (1997) as well as Harley (2014a), already discussed (see section 4 and section 5.1). As we already noted, within such root-based derivations, the distinction between RNs and ASNs cannot be captured, as DNs, in both instantiations, are derived directly from the root. Against that backdrop, we do have accounts, most notably Alexiadou (2001), which propose a verbal spine for ASN, but subscribe to the view that R-nominals involve direct merge of NOM with a root.



The problems with the claim that R-nominals are derived directly from a root are the very same ones that plagued the proposal that all DNs are thus derived and hark back to the implicit claim in Chomsky (1970), that morphological complexity is not a syntactic factor, and quite possibly, not a grammatical factor altogether. It is entirely clear that R-nominals are not only available with nominalized bare roots (e.g., *formation*), but also with fully derived verbs, with R-nominals such as *sexualization*, *justification* or *enjoyment*, which clearly cannot be derived directly from the root. While one could, of course, suggest that the morphological complexity attested here is post-syntactic, an agenda which seeks to integrate WF back into the syntax cannot easily avail itself of that claim without rendering the entire research agenda vacuous (and see Harley 2009b for that very same observation).

We note, before proceeding, that if the three claims in (107) are endorsed, as they are in much of the constructivist literature, the syntactic accommodation of forms such as *sexualization* is actually a straightforward matter, with the structure as in (108):

107. A. Bare Phrase Structure  
 B. Argumental structure is accomplished through dedicated functional structure  
 C. Syntactic operations may combine partial extended-projection spines
108. 
$$\begin{array}{ccccc} [N/n \text{ NOM} & [V/v \text{ V/v} & [A/a \text{ A/a} & \sqrt{\text{ROOT}}]] \\ \text{ation} & \text{ize} & \text{(u)al} & \text{sex} \end{array}$$

In turn, the derivation in (108) is licit only if it is assumed that the minimal verbal or adjectival spines in (108), consisting, respectively of  $A/a^{\min/\max}$  and  $V/v^{\min/\max}$ , come without any inherent semantic or syntactic properties beyond their categorial functions, consisting solely of the label projected (V, A) and the label of the complement domain ( $V[A]_{\text{ize}}$ ,  $A[N]_{\text{al}}$ ). Differently put, the derivation in (108) presupposes that categorial labels are pure categorizers, and *do not* have inherent properties which force the existence of some particular syntactico-semantic structure which cannot be accommodated in the sparse structure of (108). As such, the structure is incompatible among others, with the categorial typology in Baker (2003), or, more relevant for the present discussion, with the claim in Higginbotham (1985) and much subsequent literature, according to which V (or its categorial offshoot  $v$ ) inherently contain an event argument. Arguments for divorcing the event argument from terminals such as  $V/v$  or  $A/a$  are explicitly, and independently, mounted in Borer (2003, 2005b), where (108) is proposed as a straightforward syntactically licit structure for R-nominals.<sup>57</sup> Matters, however, are not quite as straightforward for Alexiadou (2009) or Harley (2009b), where it is explicitly (Alexiadou) or implicitly (Harley) assumed that  $v$  entails an event argument, and hence necessitates the realization of event arguments or at the very least an event reading, and is hence incompatible with R-nominals. RNs, therefore, must be derived without  $v$  and directly from the root, and require, as a consequence, a special

<sup>57</sup> Like all arguments, the event argument, for Borer (2005b), is associated with a dedicated functional node, EventP. See also Travis (2010 and earlier work) for a similar functional claim differently executed. The rationale for divorcing the event argument from V and A in Borer (2005b) is directly applicable to  $n$  and  $v$  which merge with roots or categorizers *below* (or to the exclusion of) any aspectual nodes or EP, clearly the case for R-nominals.

treatment when they have clear verbal source, as in the case of *justification*, *sexualization* or *enjoyment*. To resolve the problem, Harley (2009b) explicitly develops a coercion-based account, in which a count NumP within the dominating nominal is complicit in coercing an R-nominal reading, without arguments, for V-derived R-nominals (and see Alexiadou, 2009, for a partial endorsement of that claim).<sup>58</sup>

Unfortunately, however, as we already observed, it is not the case that count reading is excluded in ASNs (see fn. 24), and conversely, both count and mass readings are available for RNs, regardless of derivational complexity, as (109a-c) show:

- |      |                             |                       |                     |
|------|-----------------------------|-----------------------|---------------------|
| 109. | a. a justification          | a vocalization        | #an enjoyment       |
|      | b. justifications           | vocalizations         | #enjoyments         |
|      | c. not enough justification | too much vocalization | excessive enjoyment |

To complete our review of approaches to RNs, recent analyses have emerged which seek to capture structurally the sense in which at least some result-denoting RNs involve an implicature of a prior event (*construction*, *destruction*, i.a.) or to encode the event properties of Simple Event Nominals (Moulton, 2014, Wood, 2020a,b, Ahdout 2021, i.a.). These analyses take as their starting point the implicature of a (potentially prior) event embedded, e.g., in agentive nominals such as (110a) but not (110b) (see, most recently, Alexiadou and Schäfer, 2010), or alternatively, in the adjectival passive in (111a), but not in (111b), (see Kratzer, 2000, Embick, 2004, i.a.):

- |      |  |
|------|--|
| 110. | a. a writer of brochures   |
|      | b. a writer  |
| 111. | a. the metal is flattened (on its adjectival, resultative reading) |
|      | b. the metal is flat (state reading)                               |

At least one way to capture these differences would be the direct merger of the categorizer with the root in (110b) and (111b), but its merger with *v*/V for (110a) and (111a), the latter potentially including a larger, or additional verbal functional structure, to yield the availability of reference to a prior event.

The direction of research spelled out by such accounts is intriguing and worth pursuing. Two *prima facie* queries do emerge, nonetheless. The first involves the fact that both (110) and (111) present cases of a two-way distinction, with one variant which references an event (in one way or another) and another which does not. This, of course, is already the picture within standard approaches to the RN/ASN distinction, with ASNs referencing a (grammatical) event, but RNs not so. The proposed analysis for a ‘result’ RN that references a prior event as distinct from a ‘state’ RN, would introduce a third variety, effectively a ‘small event’, for DNs, which involves a *distinct* way of

<sup>58</sup> Historically speaking, the attribution of an event role to *v* harks back to the fundamental confusion emerging from Marantz (2001) surrounding the dual role of *v* as a (pure) categorial label, alongside its role as licensing the external argument and an event interpretation. Subsequent accounts removed the external argument from *v*, and postulated, in its stead, Voice, which is responsible for the emergence of the host of properties associated with external arguments (present or suppressed). In view of that, the continuing linkage of the event argument with *v* (rather than Voice) is puzzling.

referencing an event and that does not come with arguments, thereby severing the connection between the (grammatical) event interpretation, and the realization of arguments. Such ‘third’ instantiation, it would appear, is not available for (110) and (111)

The second problem involves the fact that the contingency on a prior event is not a unique property of verbal derivatives and is associated as a matter of routine with all nominals which reference a potential creation or a change from a prior state, including e.g., *novel*, *cake*, *misfortune*, *accident*, or *stain*, all of which requiring an event, prior or not, to make sense. Introducing structure into (113a-b) to accommodate a result reading but not into (112a-c) thereby requires careful argumentation:

112. a. Your (newly found) fame {will last 15 minutes/is the result of careful PR}  
 b. This stain emerged this afternoon (as a result of exposure to the sun)  
 c. My trials and tribulations lasted 7 years  
 d. The accident occurred during my vacation  
 d. The novel is finished; the cake failed to rise etc.
113. a. The *injury* occurred during my vacation  
 b. this type of *discolouration* is caused by water and is reversible

We note that as within other domains pertinent to the analysis of DN<sub>s</sub>, the execution is crucially contingent on grammatical assumptions which find their motivation and justification outside the domain of DN<sub>s</sub>, and which, in the cases under consideration, concern the appropriate representation for events, the event argument, and argumental event structure in general. While the properties of DN<sub>s</sub> may provide evidence that bears on such general debates, their ultimate resolution will, at the end of the day, be based on broader theoretical considerations.

### 6.3 R-nominals and Content

The observation that ASN<sub>s</sub> are compositional, Content-wise, but R-nominals need not be is implicit in many treatments of the ASN<sub>s</sub>/RN<sub>s</sub> distinction, but it has never been made fully explicit until Borer (2014), quite possibly because intuitive as it might be, within the RoN approach or that of Marantz (1997, 2001) it is neither predictable nor explainable. Even more broadly, it cannot possibly follow from any lexical treatment, although, depending on structure, it may follow from syntactic ones as I shall briefly detail below.

Consider, from that perspective, the DN *Transformation* (capitalized to indicate the technical linguistic use). It clearly is not compositional on the meaning of a verb (or root) *transform*, because the verbal instantiation lacks the technical sense, as shown in (114a), which can only have a construal of *transform* as ‘change’. In turn, (114b) *cannot* be an ASN, with the meaning ‘the linguist performed a *Transformation* on the structure.

114. a. the linguist transformed the structure ( $\neq$  *performed a Transformation*)  
 b. the linguist’s transformation of the structure ( $\neq$  *act of performing a Transformation*)

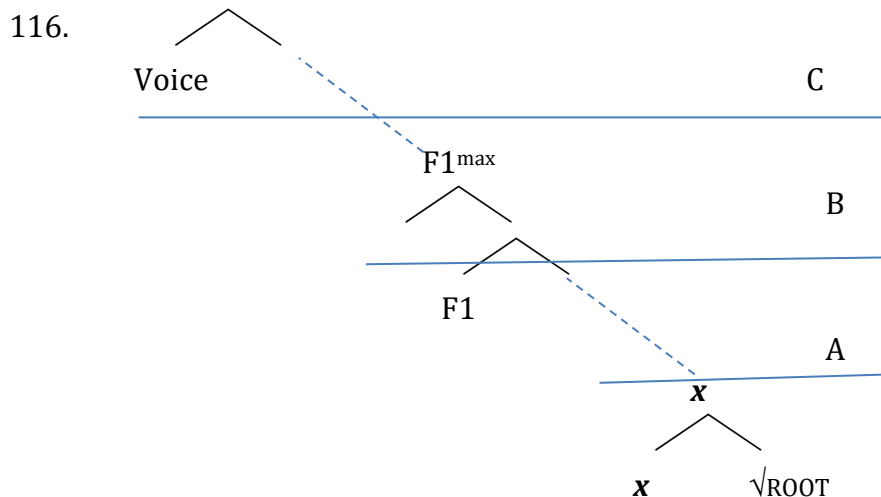
This, Borer notes, is quite puzzling from lexicalist perspectives, as listedness, by and large, correlates positively with argument structure specification, and so the listed Content of *Transformation* is not expected to make it impossible for N to assign argumental roles. Matters are exacerbated by the fact that *Transformation* is a Simple Event Nominal, and that whatever putative arguments it could have, as evidenced from its occurrence in the context of a light verb such as *perform* in (114a) with clear *agent/patient* construal, are the very same that would be assigned by the verb *transform*, or the compositional ASN derived from it, in (114b) (and recall in that context some listedness puzzles already flagged in section 2.3).

Viewed from the perspective of syntactic accounts of WF, constructivism has dealt with the potential emergence of non-compositional Content in conjunction with syntactic structures by assuming the following:

115. A Content insertion is post-syntactic (property of an interface)
- B Content insertion is local (possibly phase-driven)
- C Content insertion is structurally delimited

The claims in (115) amount to the suggestion that contra lexicalist assumption, Content is not the property of terminals, but may be associated with more complex constituents, a claim that can only be executed if lexical terminals do not merge with their Content already fixed. From that perspective, the bifurcation, Content-wise, is not *Syntax* → *obligatory compositionality*, vs. *Lexical* → *optional compositionality*. Rather, this approach effectively draws a horizontal line across the syntactic derivation at a well-defined spot, with the claim that constituents fully below that line may be associated with late-inserted listed Content, but not so constituents which straddle the line.

While constructivists by and large agree on this general approach to Content, differences do, nonetheless, exist relative to the way in which Content is delimited (115C), or differently put, where exactly to draw the ‘horizontal’ line in question. Three hypotheses have emerged in the constructivist literature regarding this matter. The first, sometimes dubbed the Arad-Marantz hypothesis (Arad, 2003, 2005 and much subsequent), delimits Content by first categorization, as in (116A). The second, advanced in Borer (2009, 2013a, 2014 and subsequent literature) delimits Content by the lowest-merging functional (non-categorical) terminal, as in (116B). Finally, Marantz (2013 and prior oral presentations and handouts) as well as Anagnostopoulou and Samioti (2013, 2014) and Harley (2014a) suggest that Content is delimited by Voice, as in (116C):



Debates on differentiating A from B have focused on the potentiality of non-compositional Content for complex forms, such as *naturalization* or *editorialize* (see, in particular, Borer, 2013b, 2014, Harley, 2014a,b, Marantz, 2013). Debates on differentiating C from either B or A have focused on the role of idioms, as well as more complex functionally articulated structures, such as Greek participles (see, in particular, Anagnostopoulou and Samioti, 2013, 2014). The matter remains very much under debate.<sup>59</sup>

Regardless of the domain of Content endorsed, however, it is easy to see how equipped with the Content-assignment claims outlined in (115), it should be possible to explain the fact that ASNs must be compositional, but not so R-nominals. Such an explanation would, per force, appeal to the claim that while R-nominals are wholly within the Content assignment domain, ASNs exceed it. Beyond these general points of agreement, however, the debate would revert back to some of the disputed matters already noted. For instance, if the Content domain is (116A), we predict the absence, within all non-compositional R-nominals, of a verbal stem. If, on the other hand, the Content domain is (116C), it would per force require all ASNs to include Voice, or their obligatory compositionality could not be explained. An intermediate set of claims correlate with (116B), whereby non-compositionality does not exclude categorial stems, but does

<sup>59</sup> The presentation here masks an important distinction between two views of Content which may not have empirical consequences for the present discussion. According to one of these views, Content is associated with (categorized) *phrases* of a prescribed size (and including  $X^{\min/\max}$ ). For an articulation of this view, see Borer (2013a, 2017). According to the competing view (cf. Marantz, 2013, Harley, 2014a), Content is firmly associated with *terminals* and specifically *roots*, but is inserted in a prescribed syntactic context which may be phrasal. To illustrate, for Borer (2013a, 2017), Content would be associated directly with the entire (boxed) verbalized phrases in i. For Harley (2014a), on the other hand, Content would be matched differently with the root  $\sqrt{\text{CEIVE}}$  in its different insertion contexts in ii (Harley, 2014a, ex. 17):

- i.  $\boxed{[v \text{ de } [\sqrt{\text{CEIVE}}]]} \rightarrow \text{FAKE}$
- ii.  $[v \text{ de } [\sqrt{\text{CEIVE}}]] : \sqrt{\text{CEIVE}} \rightarrow \text{FAKE} / \text{de } \underline{\hspace{1cm}}$
- i.  $\boxed{[v \text{ con } [\sqrt{\text{CEIVE}}]]} \rightarrow \text{THINK}$
- ii.  $[v \text{ con } [\sqrt{\text{CEIVE}}]] : \sqrt{\text{CEIVE}} \rightarrow \text{THINK} / \text{con } \underline{\hspace{1cm}}$

In the context of non-compositional DNs, these approaches would differ in whether e.g., *question* is associated with Content as a complex expression, or alternatively,  $\sqrt{\text{QUEST}} \rightarrow \text{ASK}$  in the context of *-ion*, but to  $\rightarrow \text{PURSUIT}$  otherwise. Note that under this latter approach, the insertion environment for root Content is not always local, as is evident from the non-compositional Content of complex forms such as *Trans-form-ation*, *con-ject-ure* or *civ-il-iz-ation*.

exclude portions of the functional spine (with the exception of F1). As a result, an ASN may emerge with a partial verbal spine that would exclude Voice, if necessary, but would still be necessarily compositional, nonetheless. The reader is referred to Borer (2014) for an extensive discussion.

## 7. Concluding Comments

The potent history of the debate on DNs should be evident from the previous (partial) review. Equally obvious should be the fact that DNs remain an extremely active area of ongoing research and analysis, with far reaching ramifications at the very least for the modelling of word formation, for the modelling of argument structure, for the modelling of Content, and for the modelling of the syntax/phonology interface. It is fair to say that a full analytical history of the construction would go a long way toward covering the analytic history of generative syntax in the past 50 plus years.

It is worthwhile devoting these concluding comments to areas which, I believe, have not attracted sufficient general attention, and where new angles for a better understanding may emerge:

### A *Simple Event Nominals:*

These remain poorly studied and poorly understood. Some emerging analyses were touched upon in section 6.2, but a fuller analysis comparing ASNs with Simple Event Nominals, both deverbal and others, as well as with underived (event) nominals is called for, as is a better semantic understanding of the nature of grammatical events such that they could be so differently syntactically realized by deverbal instantiations, and with an argumental array, on the one hand, and event-referring nominals without a verbal analytic history and without arguments, on the other hand.

### B *NOM properties:*

That the phonological realization of NOM is at least sometimes contingent on the size/properties of the verbal spine seems like an inevitable conclusion. This conclusion, however, leaves as an open puzzle the massive homophony of NOM instantiations, in multiple languages, between RN (including Simple Event Nominals) and ASN, as well as between different manifestations of ASN. One example may illustrate the difficulty. If, as Alexiadou (2017) and others suggest, DNs-*ing* entail the projection of VoiceP, the systematic occurrence of -*ing* in R-nominals, as reviewed already in 3.3.3, becomes a puzzling homophony. Conversely, DNs-*atk*, by assumption, do *not* project VoiceP, but may project whatever portion of the verbal spine is responsible for the realization, at the very least, of the internal argument and aspectual modifiers. That portion is clearly not available in RN, where, by assumption, NOM-*atk* merges either with a root, or with a bare V. How, then, can we capture the restrictions on NOM-*atk*? One possibility, of course, would be to say that NOM-*atk* may merge with any FV, where FV is a member of the verbal spine. But that, clearly, would be inadequate, if NOM-*atk* may *not* merge with VoiceP. While clearly a generalization is possible that would allow merge up to VoiceP, the statement, regardless of its empirical adequacy, is theoretically unattractive, insofar as at least relative to our present understanding of the verbal spine, there is no natural



division such that it groups together whatever is under Voice and separates it from the verbal functional spine from Voice upwards.

Matters are not helped by the fact that in many languages, including English, there are instances of NOM which may merge with an otherwise attested verbal stem, but which never give rise to ASN, nonetheless. In English, this appears to be the status of *-age* illustrated in (117). Even more puzzling is *-(t)ure*, which blocks ASN in some of its instantiations (118a), but allows it in others (119a-b):

- 117. a. The blockage of the Suez Canal (\*by an oil tanker; \*for six days; \*in order to disrupt international commerce)
- b. The blocking of the Suez Canal (by an oil tanker; for six days; in order to disrupt international commerce)  
(and similarly *coinage*, *drainage*, *leakage*, and many others)
- 118. a. The mixture of the chemicals (\*by the graduate student; \*for/in several hours; in order to complete the assignment)
- b. The mixing of the chemicals (by the graduate student; for/in several hours; in order to complete the assignment)  
(and similarly *fixture*, *closure* (*disclosure*, *enclosure*, *foreclosure*))
- 119. a. The deliberate departure of the guests at noon
- b. the exposure of the film to light for 7 minutes

Note that the restrictions on *-age* and *-(t)ure* here cannot be captured by relegating them to root selection. While it is true that both *-age* and *-(t)ure* may only merge directly with roots, that is also the case for *-ance/-ence* and *-al* (*adherence*, *arrival*), which do allow the formation of ASN. What, then, is to distinguish *-age* and *-(t)ure* from *-ance/ence* or *-al*? Clearly, not their immediate morpho-phonological environment, and clearly not the availability of some portion of the verbal spine. If the distinction is to be mediated through the properties of NOM, we note, it would either need to be semantic (along lines originally suggested by Grimshaw, 1990), or in turn, it would require a formally distinct characterization of bare *v/V*/root on the one hand, and larger verbal spines, which may allow for grammatical events and arguments, on the other hand. But if the latter option is the case, we are back to the massive homophony already noted, which would associate e.g. *-ance* with one set of selectional properties which are identical to those of *-age* to give rise to licit RNs, and another one, which is entirely distinct, which would allow ASNs for *-ance*, but not for *-age*.

As has been noted repeatedly, the puzzle highlighted here repeats itself in multiple languages, including some that are clearly not genetically related. In view of that, it is clear that what is at stake could not truly be a homophony, as systematic cross-linguistically attested homophony within the same grammatical domain is at the very least implausible, if not absurd. Something fundamental, then, is being overlooked here, and it is to be hoped that future research will shed light on it.

And finally:

### C. Cross linguistic investigations.

The last decade, in particular, has seen a substantial expansion of our knowledge base regarding DNs, which was already considerable. Within these investigations, there remains a tension between what is common, what could, and should, be captured using the same basic analytic tools, and that which is language specific. Exactly because we already know so much about DNs, we are in a position to conduct an extremely well-informed search for both similarities and differences with existing constructions and existing analyses, in the hope that the overall result will shed light not only on the properties of DNs, but also on the properties of the rich grammatical phenomena which are linked to their explanation.

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## Glossary

NOM: N/*n* categorizer

NOM-*ing*: NOM realized as *-ing*.

NOM-*atk*: NOM realized as *atk*.

*atk*: *-ATion and Kin*: the set of non-*ing* overt NOM realizations in English (*-ation*, *-ment*, *-al*, *-ance/ence* etc.)

NOM- $\emptyset$ : phonologically unmarked NOM

DN-*ing*: derived nominal with NOM-*ing* (DNs-*ing*)

DN-*atk*: derived nominal with NOM-*atk* (DNs-*atk*)

DN- $\emptyset$ : derived nominal with NOM- $\emptyset$  (DNs- $\emptyset$ )

ASN: AS-nominals, argument structure nominal

RN: R-nominal

RN-*ing*, RN-*atk*, RN- $\emptyset$

ASN-*ing*, ASN-*atk*, ASN- $\emptyset$

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