Exo-skeletal vs. Endo-skeletal Explanations:
Syntactic Projections and the Lexicon

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1. Introduction

Within generative traditions, the dominant approach to the projection of argument structure crucially links it to information in the lexical entry of argument selecting heads (verbs, adjectives, possibly nouns). Various executions of this leading idea may vary. Thus within many approaches, the argument structure associated with a particular lexical head is derived from the lexical semantics of that head (Jackendoff, 1990; Levin and Rappaport-Hovav, 1995; Carrier and Randall, 1992, among many others); within other approaches, the argument structure of a verb is a formal object, subject to formal manipulations, which do not represent direct mapping from lexical semantics (Williams, 1981; di Sciullo and Williams, 1987; Grimshaw, 1990; Reinhart, 1996, 2000). These approaches also differ on how argument-structure changing functions operate and where: in the lexicon, on lexical entries, as in Williams, (1981); di Sciullo and Williams (1987); Levin and Rappaport-Hovav (1995); Grimshaw (1990); Reinhart (2000) or alternatively, there are no argument structure changing functions as such, and what appears to be argument structure changing operations are the result of syntactic manipulations such as incorporation, as in the UTAH tradition, largely influential since Baker (1985, 1988). These approaches also differ on the nature of the relevant semantic roles (*agent, theme, goal,* etc., or alternatively, *subject of change, subject of result, path,* etc.). It is nevertheless fair to say that they all do have in common the assumption that the original, crucial locus for argument structure specification is a lexical entry of an assignor, and that at least some level of structure, whether syntactic or lexical, projects directly from that entry.[1]

In (1), I give a somewhat schematized representation of this class of approaches:

1. (Semantics of Lexical item →) Predicate-Argument structure →
   structure (syntactic or lexical)

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[1] Nor is this assumption unique to the Extended Standard Theory, or GB and its direct descendent. It also characterizes Lexical Functional Grammar (LFG) and Head-Driven Phrase Structure Grammar (HPSG).

Consider, however, another approach, according to which much, if not the entire burden of argument structure is shouldered by the syntax. To consider a simple illustration, suppose it is not the case that *agents* project externally (universally), but rather, that nominal expressions which project externally must be interpreted as *agents*. Put differently, the syntactic structure gives rise to a template, or a series of templates, which, in turn, determine the interpretation of arguments. Within such approaches lexical items do not determine structure, but rather, function as its modifiers. Traditionally, this is a position that is associated with Construction Grammar (Fillmore and Kay, 1997; Goldberg 1995). More recently it has come to be associated with a number of models (often referred to as neo-constructionist models) which share to a varying degree a view of the grammar in which at least some argument structure interpretation is divorced from the lexical entry and rather, is determined by the structure. (see van Hout, 1992, 1996; Borer, 1994, 1998; Kratzer, 1994, 1996; Marantz, 1996, 1997; Harley, 1995; among others). Focusing here on the universal execution of this research agenda, the picture put forth within such models could be schematized as in (2):

2. Syntactic structure → event structure → interpretation of arguments

Reaching beyond the representation of argument structure, the lexicon-driven approach and the syntax-driven approach are but the tip of a much deeper theoretical iceberg. Assumptions concerning the division of labor between the lexicon and various computational systems have always played a crucial role within linguistic theories. At one extreme of the continuum from lexicon to computation, we find a view of the human linguistic capacity fundamentally anchored in our demonstrable ability to acquire an intricate lexicon, based, at least in part, on a complex conceptual system. Within such a view, formal properties are deterministically projected from a listed item with fully articulated lexico-semantics, syntactic and morphological properties. Such properties include not just argument structure, but also syntactic category, syntactic projection environment, and morphological information. I will refer to such approaches as *endo-skeletal*, focusing, as they do, on the listed item as the skeleton around which the structure is built. At the other extreme, we find a view anchored in our equally demonstrable rule-governed behavior. Such approaches assume a linguistic ability which is fundamentally computational, with as small as possible repository of idiosyncratic information appended to it, by means of a lexicon, beyond the clearly arbitrary pairing of sound and meaning. While most grammatical models occupy some intermediate place on this continuum, it is, I believe, fair to say that these two extreme positions

characterize what counts as a linguistic explanation within most models. Here, I will take a strong computational position.

It is in the nature of things that an endo-skeletal approach, with its ability to associate idiosyncratic as well as unpredictable syntactic properties with atomic listed lexical items, is both less restricted and more redundant, but also, potentially, more capable, at least prima facie, of describing the wealth of phenomena attested in natural language. Nonetheless, even it turns out that some pairing of (some) listed items with syntactic properties is inevitable, the cause of explanatory adequacy could be greatly served by a systematic investigation of the extent to which the structure does determine the syntactic environment of inserted listed items, rather than the other way around. To this end, I will be pursuing here at least some of the consequences and the predictions of a strong computational position, illustrating specifically both modes of execution as well as a number of empirical advantages of such an approach.

More specifically, I will suggest that syntactic properties typically associated with listed items, notably argument structure and category type, are, in fact, properties of structures and not properties of the listed items themselves. While listed items may still convey an idea (e.g., *potato* is distinct from *pumpkin*), I will attempt to reduce as many as possible of the formal properties traditionally attributed to lexical listing to formal computational systems, be they syntax or morphology. I will call this view *exo-skeletal*, given its focus on the way in which the structure, rather than the listed item, determines not only grammatical properties, but also the ultimate fine-grained meaning of lexical items themselves (an effect at times called *coercion*).[2] If successful, then, an *exo-skeletal* research program is looking at a highly impoverished substantive lexicon which is a true interface with the conceptual system, and which contains little beyond the sound-meaning pair.

2. The exo-skeletal approach.

Consider the following execution of an exo-skeletal research program. Within such an approach there is a reservoir of sound-meaning pairs, where by *meaning* we refer to the appropriate notion of a concept, and where by

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[2]With special thanks to Henry Davis for having suggested the term *exo-skeletal* for this specific research agenda.

sound we mean an appropriately abstract phonological representation.[3] Following tradition, I will refer to that reservoir as the *encyclopedia*, and to items within it as *encyclopedic items* (EIs). Crucially, an EI is not associated with any formal grammatical information concerning category, argument structure, or word-formation. It is a category-less, argument-less concept, although its meaning might give rise to certain expectations for a felicitous context.[4] It is EIs that are initially selected to form part of what I will call the conceptual array. In the absence of a category determination, however, they are inserted as an unordered set into an unmarked lexical phrasal domain (L-DOMAIN, L-D), as in (3):

3. [$_{L-D}$ *sink, boat, dog*]

Alongside the encyclopedia and distinct from it the grammar does have a functional lexicon, including, in essence, grammatical formatives in the form of features (e.g., [+pl], [+pst]) as well as independent grammatical formatives (e.g., <*the,*[+def]>. Simplifying somewhat (but see Borer, 2001, for a fuller discussion), we may say that some grammatical formative α merges with L-D, in turn projecting some functional structure. Particular functional structures, in turn, will categorize whatever L-D they dominate. Consider, as an illustration, α to be equivalent of some value for Tense, e.g. <pst>, in a language in which the verb is inflected for tense. The merge of <pst>$_T$ and L-D would give rise to the structure in (4):

4. [$_T$ <pst>$_T$ [$_{L-D}$ *sink, boat, dog*]]

Assuming free copy and merger (and abstracting away from the covert nature of verb movement in English), any of the items in L-D may now merge a copy in T, but under standard assumptions, only one may do so. Whichever element moves will become the head of L-D, as it must be a head, having merged a copy in a head position. In turn, L-D will become a VP in

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[3]We are making no claims here on the organization of conceptual systems, assuming this important issue to be within the domain of psychological and/or philosophical studies, but clearly extra-linguistic. We only claim that the conceptual system, however internally organized and constrained, is the appropriate input to the sound-meaning pairing.

[4] It is within the domain of 'felicitous context' that we locate the selectional restrictions of Chomsky's (1965) Aspects model, assuming them to be fundamentally conceptual and not grammatical. We note that selectional restrictions can, and are regularly over-ridden by the grammatical environment (i.e., coerced), but that the opposite is never true. Thus a noun with a denotation of 'stuff' (e.g., sand) will receive a count interpretation in the context of a plural marking or plural agreement (e.g., many sands), but a plural-marked noun will never receive a mass interpretation, no matter how salient the context (compare too little carpet for the money with *too little carpets for the money).
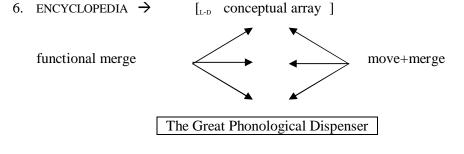
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the context [$_T$ [$_{L-D}$]], making its head in T, as well as its copy effectively, a v. There only remains to be hoped that some post-derivational phonological storage area will be capable of dispensing, for the resulting v+<pst> structure, a well-formed phonological representation, for if it does not, the derivation would not converge and ungrammaticality would result. [5]

    As it turns out, in English, there will be a phonologically felicitous representation for all the heads in (4), should they choose to merge a copy in T:

5.   a. [$_T$ [$_v$*sink*]-<pst>$_T$ [$_{VP}$ ~~[$_v$sink],~~ *boat, dog*]] (*sank*)
     b. [$_T$ [$_v$*dog*]-<pst>$_T$ [$_{VP}$ *sink, boat,* [$_v$~~dog~~]]] (*dogged*)
     c. [$_T$ [$_v$*boat*]-<pst>$_T$ [$_{VP}$ *sink,* [$_v$~~boat~~]*, dog*]] (*boated*)

    However, consider <fut> in English. A derivation in which an array item from L-D merges a copy in T would not converge due to the absence of an appropriate phonological representation for v+<fut>. On the other hand a well-formed derivation with a future interpretation could still result just in case the correct phonological formative <*will*> merges with T. Here as well, L-D will become VP in the context of TP. As for its head, if no relevant categorizing morphology can distinguish the items in L-D, any of them could, in principle, be the head. The structure will not, however, remain hopelessly ambiguous, quite simply because the non-head constituents will be themselves embedded under functional structure, categorizing them, so to speak, presumably as DPS or PPS. Should that not turn out to be the case the structure would become uninterpretable. The two modes of projecting functional structure, the one associated with English past tense, the other with English future, are, I believe, the two major strategies universally available. As is obvious, they do not characterize an inter-grammatical situation, but rather, an intra-grammatical one.

    Schematically, then, our grammar looks as in (6):

6.   ENCYCLOPEDIA →   [$_{L-D}$ conceptual array]

functional merge   move+merge
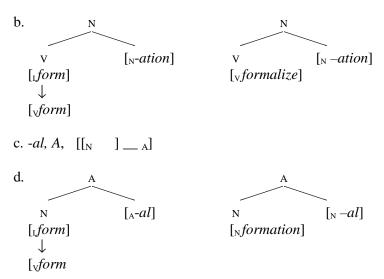
The Great Phonological Dispenser

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[5] The affinity with Anderson (1992) should be self evident here.

Categorizing, then, can be achieved by the phrase structure of functional projections, with straightforward examples given in (7):[6]

7. $[_{\mathbf{D}}$ $<...>_D$ $[_{L\text{-}D}\, dog,\, form]]$ L-D → NP
   $[_T$ $<...>_T$ $[_{L\text{-}D}\, dog,\, form]]$ L-D → VP
   $[_{\#}$ $<...>_{\#}$ $[_{L\text{-}D}\, dog,\, form]]$ L-D → NP

In turn, categorizing can also be accomplished by a morphological structure (distinguished here from inflectional/functional features). Thus category-labeled morphemes such as *–ation, -ize, -al, -full,* etc. are members of the functional lexicon associated with a syntactic lexical category, and therefore can interact with the conceptual array. In turn, they not only carry a category themselves, but also categorize their morphological complements, should they happen not to have a category already:
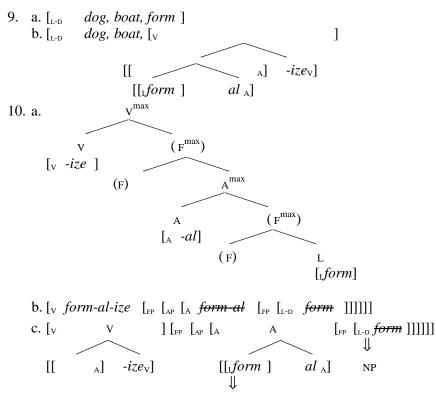
8. *Categorizing by Morphological Structure:*
   a. *-ation, N,* $[[_V \quad] \underline{\quad}_N]$

   b.

$$
\begin{array}{cc}
 & N \\
\swarrow & \searrow \\
V & [_N\text{-}ation] \\
[_I form] & \\
\downarrow & \\
[_V form] &
\end{array}
\qquad
\begin{array}{cc}
 & N \\
\swarrow & \searrow \\
V & [_N\,\text{--}ation] \\
[_V formalize] &
\end{array}
$$

   c. *-al, A,* $[[_N \quad] \underline{\quad} A]$

   d.

$$
\begin{array}{cc}
 & A \\
\swarrow & \searrow \\
N & [_A\text{-}al] \\
[_I form] & \\
\downarrow & \\
[_V form &
\end{array}
\qquad
\begin{array}{cc}
 & A \\
\swarrow & \searrow \\
N & [_N\,\text{--}al] \\
[_N formation] &
\end{array}
$$

The morphological structures in (8) may operate on items of the conceptual array, in L-D, giving rise to (9), or alternatively, catgorizing morphemes such as *–ation* or *–al* may merge independently in the syntax as N or A respectively, in turn heading an N^{max} and A^{max}. In this latter case,

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[6] In English, and perhaps universally, there are no productive conversions with adjectives, productive adjectivizing typically requiring overt morphology. It would appear that for reasons that may or may not be English-specific, adjectives never originate as "pure" category-less EIs.
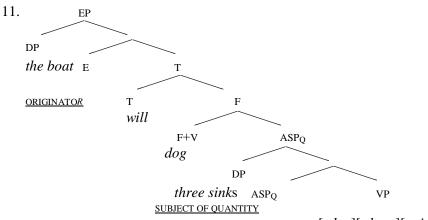
head movement would take place, and the structures in (8) would be applied to the output of head movement, as in (10):

9. a. [_{L-D}   *dog, boat, form*]
    b. [_{L-D}   *dog, boat,* [_V   ]

                              [[_A]   *-ize*_V]
                                [[_L *form*]   *al* _A]

10. a.   V^{max}

                    V   (F^{max})
              [_V *-ize*]
                        (F)   A^{max}

                                  A   (F^{max})
                              [_A *-al*]
                                        (F)   L
                                                     [_L *form*]

    b. [_V *form-al-ize* [_{FP} [_{AP} [_A ~~form-al~~   [_{FP} [_{L-D} ~~form~~]]]]]]
    c. [_V   V   ] [_{FP} [_{AP} [_A   A   [_{FP} [_{L-D} ~~form~~]]]]]]
                                                                              ⇓
        [[_A]   *-ize*_V]   [[_L *form*]   *al* _A]   NP
                                                       ⇓
                                                       N

In, (10), note, [_L *form*] becomes a noun through its morphological environment, in turn making its copy a noun, and the L-D dominating it, an NP.

     As EI do not in and of themselves have arguments, by assumption, I will assume that argument structure, an event complex, emerges through functional syntactic structure, which has the effect of 'verbalizing' an L-D, in the intended sense, in some event complexes, and possibly 'adjecivizing' some other L-DS, in other event complexes (e.g. stative ones, but see fn., 6). Specifically, and following a somewhat simplified version of Borer (1994, 1998, 2001), by virtue of being in the specifier of ASP_Q, *sink* in the structure in (11) is assigned a DP structure, thus allowing the merger of functional DP internal material (in this case, *three*). In turn, *three sinks* in [Spec,ASP_Q] is assigned a *subject-of-quantity* interpretation, in essence, equivalent to an interpretation associated with undergoing a structured change. *Boat,* in turn

is assigned DP structure in [Spec, TP] thus licensing the merger of DP internal functional material (i.e. *the*). It then moves from [Spec, TP] to [Spec,EP], where it is assigned the role of an *originator* (of a non-stative event). Finally, and more crucially from the perspective of our focus here, all the functional nodes in (11) are verbalizers, turning L-D into a VP and categorizing *dog* as a verb (for concreteness, we assume overt short movement of the verb in English to a functional position above ASP$_Q$. See Johnson, 1991, Runner 1995, for discussion):[7]

11.

$$[_v\text{\textit{dog}}][_{DP}\text{\textit{boat}}][_{DP}\text{\textit{sink}}]$$

The output of (11) is in (12a). Likewise, the conceptual array in (5), together with the grammatical formatives *will, the, three*, could, in principle, give rise to all the sentences in (12) and more. Some are, of course, more compatible with world knowledge, or with selectional restrictions, than others. This we believe, however, to be outside the domain of the computational grammatical system, and strictly within the conceptual domain. Syntactically, note, they are all unambiguous, in assigning to the

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[7] The terminology used in Borer (1994, 1998) is ASP$_E$, rather than ASP$_Q$ as responsible for the assignment of 'objective' roles in telic contexts, and ASP$_P$, as responsible for the assignment of the *originator* role, rather the EP. See Borer (2001) for some discussion on the rationale for the modifications. The notion 'undergoing structured change' is clearly reminiscent of notions such as 'incremental' or 'gradual' theme, proposed in Dowty (1991) and Krifka (1992). In Borer (2001), however, I argue that *subject-of-quantity* need not be a theme, and that the change under consideration need not be incremental, as such.

We note that the focus here is not on the actual interpretation of arguments or the relevant functional structure, but on the fact that some such structure must exist if argument interpretation is to be assigned to DPs away from lexical listing.

first DP the role of *originator* and to the second DP the role of *subject of quantity* entirely independently of plausibility:

12. a. the boat will dog three sinks
    b. The dog will sink three boats
    c. The boat will sink three dogs
    d. Three sinks will boat the dog
    etc.

A striking illustration of the malleability of EI is available from the following paradigm, from Clark and Clark (1979). Note that *siren*, to begin with, is turned verbal by the syntactic contexts in (13), in which, in turn, it clearly functions as a modifier of an action, largely interpreted through the syntactic structure, rather than the determinant of the argument structure combinations available:

13. a. The factory horns sirened throughout the raid
    b. The factory horns sirened midday and everyone broke for lunch
    c. The police car sirened the Porche to a stop
    d. The police car sirened up to the accident site
    e. The police car sirened the daylight out of me

It is worthwhile noting that if argument structure is determined by the structure and not by the projection of information in lexical entries, it may be the case that relationship between structure and argumental interpretation are fixed, but nevertheless, different for the same stem in different contexts. Thus, for instance, if the subject in the context of *destructible* is interpreted as a *subject-of-state,* but an object in the context of *destroy* is interpreted as a *subject-of-quantity*, there is no particular reason to assume that they are projected in the same structural position. If, however, as endocentric, UTAH-driven approaches would have it, *destroy* assigns an internal (*theme*) argument in all its realizations, we would be committed to claiming that in both *destroy* and *destructible* (and, of course, *destruction*), a *theme* argument is projected in an identical position. For the paradigm in (13) this would mean that all occurrences of *siren* would have to be syntactically derived from a common source, a rather difficult fit. If, however, *siren* has no independent properties, and the argument structure in which it is embedded is syntactically, rather than lexically, driven, no such problems emerge. From this perspective, then, an exo-skeletal approach is more descriptively adequate here as well as theoretically simpler, without any need for compromising restrictiveness.

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3. Some questions and some goals:

Any model which attempts to redefine the way in which category and argument structure come to exist must show not only that it is prima facie plausible and that it has some explanatory potential, but also that it makes at least some predictions which are fundamentally distinct (and, hopefully, correct) from those made by the model which it attempt to replace. In what follows I will attempt to show that some such predictions do exist, both within the syntactic andand the morphological domain. I will further attempt to refine further the notion of listed item, as it is used in this work, elaborating, specifically, on the interaction between the morpho-phonological properties of words and structures. The specific subject matter on which I will focus concerns properties of nominals in general and derived nominals in particular.

Consider some of the obvious questions that do arise in the context of the treatment of categorizing and argument structure sketched above. First, note that the derivation of e.g., [$_N dog$] and [$_V dog$], as described in (7), gives rise immediately to the question in (14):

14. Is it necessary, or desirable, to postulate, for English, a $\varnothing$-affixation rule mapping N$\rightarrow$V or V$\rightarrow$N (or alternatively, a rule of conversion mapping one to the other)? Alternatively, all such $\varnothing$-alternations are syntactically, rather than morphologically, determined, by inserting a category-neutral EI into a syntactically or morphologically deterministic structure. Even more importantly, does the assumption that *dog* is a category-neutral EI inserted into distinct syntactic environments have empirical consequences which are distinguishable from those which emerge if some categorical instance of *dog* (say the verb) is derived from the other?

Second, consider the issue of argument structure within derived nominals, and more specifically, the pair in (15):

15. a. The enemy destroyed the city
    b. The enemy's destruction of the city

As of Chomsky (1970), it is standardly assumed that the relations which holds between the noun *destruction* and *the city* in (15b) parallel, and indeed have the same lexical source, as those which hold between *destroy* and *the city* in (15a). The fact that in the case of (15a) it is a verb which is thus related to the object, but in (15b) it is a noun is theoretically insignificant in this context. Consider, however, the pair in (15) from the perspective of an account which attributes the interpretation of arguments to

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functional structure, which has, in turn, verbalizing (or adjectivizing) properties. If such an approach is on the right track, it means not only that the role of *the city* cannot be assigned by either *destroy* or *destruction*, but also, that if, indeed, *the city* is assigned a role in (15b) on a par with the role assigned to *the city* in (15a) (e.g., in [Spec,ASP_Q], as *subject-of-quantity*), there must be a verbal constituent within (15b). Even more strongly, a strong semantic claim emerges from the specific syntactic execution here, according to which nouns, as such, may never have (event) argument structure, and every instantiation of (event) argument structure, by virtue of its categorizing properties, must include either a VP or an AP projection. Our next task, then, is to answer the question in (16):

16. Can it be shown that there is, indeed, a verbal constituent in (15b), together with the relevant functional structure (as in e.g. (11)) responsible for the assignment of argument structure? Can it be shown that nouns, as such, never have (event) argument structure, and that (event) argument structure always require the projection of either a verbal or an adjectival constituent, in the relevant functional configuration?

In the following sections, I will address these issues. In sections 4-5 I review Grimshaw's (1990) analysis of derived nominals, assuming her descriptive conclusions to serve as the starting point for any adequate future research on derived nominals. Nevertheless, her specific analysis, crucially embedded within a lexical approach to role assignment, is reviewed and rejected. The conclusions I reach are summarized in (17):

17. a. So-called complex event nominals (in the sense of Grimshaw, 1990), are derived from the presence of a nominal structure above an argument structure event complex, including either a VP or an AP alongside functional structure, e.g. as in (i):
    i. $[_N$ *–ation/-ing* $[_{EP/ASPQ}$ $[_{L-D}$ ...L .]]]
    In (i), ASP_Q as well as EP are verbalizers, and hence L-D is a VP. In turn, L(= v for (i)) merges with *–ation/-ing* and is (or is not) assigned morpho-phonological structure. More specifically, the event interpretation of complex event nominals cannot be a property of nouns or of nominalizing affixes as such, contra Grimshaw (1990).
    b. So-called result nominals are derived from the presence of a nominal structure directly above the EI, projected within the conceptual array.

Having elaborated on the properties of nouns which are derived from verbs with overt affixation, I turn to the status of so-called ∅-affixation or

conversion, and to the question posed in (14). I address this question specifically in the context of so-called ∅-derived nominals such as *a walk, a talk, a drive, a break*, etc. An examination of their properties, undertaken in section 6, leads to the conclusions in (18):

18. a. Ø-marked N⇔V alternations are not derivational, but represent category neutral EIs inserted in different syntactic environments. There is Ø categorically-marked affix in English (universally?)[8]
    b. The absence of '∅-derived' complex event nominals follows directly from the exo-skeletal model, combined with the absence of ∅-categorial affixation in English, and in fact, provides strong evidence for the particular exo-skeletal model proposed here.

Within a neo-constructionist or exo-skeletal approach, with its impoverished listed representations that are devoid of category and argument structure information, yet another important question arises, concerning the degree to which encyclopedic entries are phonologically abstract. To consider a concrete example, suppose we look at the pair *eat-feed* in English, semantically displaying a rather similar relation to that associated with *sink.transitive-sink.intransitive*. Could we assume that there is one EI, say EAT with appropriate semantic value but no phonological (or syntactic) properties, and which, depending upon the existence or lack thereof of a causative syntactic structure, would result in the picture in (19a-b)?

19. a.   [$_V$ EAT] → */eat/*
    b. [$_V$ CAUSE [$_V$ EAT] → */feed/*

The conclusion to be reached here, as based on the discussion of derived nominals, will be that the representation in (19) must be rejected. Rather, we will conclude that EIs must be associated with (at least some abstract) phonological matrix. While some phonological manipulation is possible, some degree of phonological faithfulness must be preserved. What is possible, I will argue, are stem allomorphs conditioned by different syntactic or morpho-phonological contexts, hence [*destroy$_V$*] ⇔[*destruct-$_N$*]; [*prógress$_N$*] ⇔[*progréss$_V$*], and also [*grow$_V$*] ⇔[*growth$_N$*], [*high$_A$*] ⇔ *height$_N$*] (but more on that below). Concretely, this means that */feed/* and */eat/* cannot

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[8] The scope of the possible universal here should be made clear. I am not suggesting that grammatical distinctions are never available without overt phonological marking. The claimed potential universal here, if indeed, shown to exist, would involve exclusively the absence of overt marking in the presence of categorial change.

be derived from the same EI.[9] In turn, the existence of phonological representation for EI will turn out to place well-defined morpho-phonological restrictions on what are and what are not syntactically possible derivations.[10]

This paper concludes with a brief comparison between the specific neo-constructionist execution proposed in this paper and other neo-constructionist executions, arguing, specifically, that a verbalizing (or adjectivizing) function is associated with all (event) argument structure, contra Marantz (1997) and Alexiadou (1999), and that the functional structure responsible for interpreting 'external' arguments may occur inside derived nominals..

4. Referential Nominals vs. Argument-Structure Nominals

4.1. Grimshaw's diagnostics

Grimshaw (1990) diagnoses two types of nominals which I will refer to as *AS*-nominals (Grimshaw's complex event nominals) and *R*-nominals (Grimshaw's result nominals) respectively, and which are illustrated in (20)-(21). They have the properties in (22)-(23) respectively:

20. *AS*-Nominals
    a. The instructor's (intentional) examination of the student
    b. The frequent collection of mushrooms (by students)
    c. The monitoring of wild flowers to document their disappearance
    d. The destruction of Rome in a day

21. *R*-Nominals
    a. The instructor's examination/exam
    b. John's collections
    c. These frequent destructions took their toll

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[9] In turn, to the extent that pairs such as *feed-eat* may be morphologically related, and hence derived from the same EI in some languages, this means that the encyclopedia cannot be considered the conceptual system proper, but rather, a true interface in which the presence of entry is determined by the conceptual system together with arbitrary, language specific vocabulary choices.

[10] The issue of the level of phonological abstractness of lexical items does not arise for strict lexicalist approaches, in which *feed* and *eat* are distinct lexical entries, but it does arise for approaches such as UTAH, in which *sink.trans* is derived from *sink.intrans*. As such, the conclusion that we will reach here is not just applicable to neo-constructionist models, but to any model which denies the independent listing of, e.g., *sink.trans* and *sink.intrans*.

22. *AS*-Nominals (Argument Structure Nominals)
   a. θ-assignors, Obligatory arguments
   b. Event reading.
   c. Agent-oriented modifiers
   d. subjects are arguments
   e. *by* phrases are arguments; In Hebrew, selects *al-yedey*
   f. Implicit argument control
   g. Aspectual modifiers.
   h. *frequent, constant* etc. possible without plural
   i. Mass nouns

23. *R*-Nominals (Referential Nominals)
   a. Non-θ-assignors, No obligatory arguments
   b. No event reading
   c. No agent-oriented modifiers
   d. Subjects are possessives
   e. *by* phrases are non-arguments; in Hebrew selects *šel* (of) *me'et*
   f. No implicit argument control
   g. No aspectual modifiers
   h. *frequent, constant* etc. possible only with plural nouns
   i. Count nouns

   The most powerful support for the classification in (22)-(23) comes from the impossibility of mixing and matching properties. Thus in the presence of an argumental *by-phrase*, a modifier such as *constant* cannot take a plural noun, nor is the omission of an object possible in (24a). Likewise, without arguments for *destruction*, the modification *in a day* gives rise to ungrammaticality.

24. a. *The constant examination(s) by the students
    b. *Mary's frequent collection
    c. *The collection to document the disappearance of mushrooms
    d. *The destruction in a day

   To account for the differences between these two types of nominals, Grimshaw (1990) proposes that *AS*-nominals, her complex event nominals, have an event argument (*Ev*), and that the argument taking properties associated with the resulting nominal derive from the presence of such an event argument. On the other hand, *R*-nominals have a referential (*R*) external argument, responsible for the result interpretation associated with them. Fully endorsing the existence of two types of derived nominals, as argued by Grimshaw, there are, nevertheless, some problems with the idea that a noun may directly assign an event argument, or be associated with

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event structure, some pointed out in Grimshaw's own work. First, as Grimshaw notes (op. cit.), many nominals which denote an event behave like *R*-Nominals, and not like *AS*-Nominals. Among these are nouns such as *event, metamorphosis, journey, trip,* etc. as illustrated by (25):

25. a. *The constant race to the mountains
    b. *The event in three hours
    c. *John's deliberate trip to the mountains
    d. *A race from the station by Mary
    e. *The metamorphosis of the town in order to win a medal

That nouns such as *event, metamorphosis, journey, trip* are, indeed, event denoting, and that this event denotation appears to have at least some linguistic consequences is indicated by the grammaticality of (26), vs. the impossibility of (27) under a similar event interpretation (*coercion* notwithstanding):

26. a. The three different races from the stadium lasted a long time.
    b. The metamorphosis of Paris will last into the next century

27. *The table lasted a long time (under an event reading, *coercion* notwithstanding)

Similarly, the contrasts in (28a,b), assuming, following Reichenbach (1948), that *happen, take place* and *occur* can only be predicates of events:

28. a. The trip/metamorphosis/event/journey occurred last night
    b. *The table occurred last night (*coercion* notwithstanding)

Thus it is clear that an event denotation, to the extent that it plays a role, cannot in and of itself induce the diagnostics in (22), and some means are necessary to distinguish between the event nominals in (20) and the event nominals in (25). To this end, Grimshaw introduces a distinction between Complex Event Nominals (=*AS*-Nominals) and Simple Event Nominals, as in (25). The distinction, primarily, is based on argument structure. While Complex Event Nominals, Grimshaw suggests, assign a role to an event argument (*Ev*), Simple Event Nominals pattern with *R*-Nominals, in not assigning such a role, and instead, in assigning a role to a referential index, *R*. Because in Grimshaw's model derived nominals have a lexical entry which is independent of their derivational history, and because an entry for, e.g., *transformation*, is in essence ambiguous between an *AS*-Nominal and an *R*-Nominal, the fact that some nouns denoting events (e.g., *metamorphosis*) do not take arguments and do not assign an *Ev* role, while others (e.g., *transformation*) do, becomes a matter of arbitrary lexical listing.

And yet the classification is anything but arbitrary. Only nouns which are derived from verbs (or as we shall see, from adjectives) by means of overt affixation can be *AS*-Nominals, while nouns which do not have a verbal or an adjectival source never are.[11] Viewed from that perspective, one is certainly tempted to view argument structure as well as event interpretation as deriving from the source verb or adjective, rather than the noun itself. But if this is indeed the case, then it would follow that nouns, as such, are never the source of event interpretation or argument structure. At the very best, they could be viewed as vehicles for passing on the roles and properties of stems embedded within them.

The problems for identifying what, exactly, is the relevant notion of event so as to apply it successfully to the diagnostic in (22)-(23) are further compounded by the fact that many *R*-Nominals derived from verbs denote an event and behave just like Simple Event Nominals, as (29)-(30) illustrate (see Zucchi, 1989):

29. a. The destruction lasted for hours
    b. The examination lasted for hours

30 a. The destruction occurred at dawn
    b. The exam(ination) took place at 5pm

What, then, is the lexical entry of *destruction*, such that it has two entries, both denoting event, but one which assigns an *Ev* role and the other an *R* role? We seem to be faced now with a difficulty which emerges directly from the assumption that an event interpretation is the basic property of the derived nouns themselves, from which the presence of argument structure derives.

And finally, we note that while *AS*-Nominals do need to have an event interpretation in the episodic sense, they need not be eventive and may be stative. Such is the case for nominals derived from adjectives, clearly in evidence whenever the adjective in question can occur with complements, directly carried over to the nominal derived from it, as (31)-(32) illustrate:

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[11] Attributing it to A. Zucchi (p.c.), Grimshaw notes this fact, but does not pursue its consequences.

31. a. The court's awareness of the problem
    b. Pat's consciousness of my presence
    c. Jill's fondness of classical music
    d. Robin's readiness to leave
    e. Marcia's closeness to her parents
    f. The party's satisfaction with the counting results

32. a. The court is aware of the problem
    b. Pat is conscious of my presence
    c. Jill is fond of classical music
    d. Robin is ready to leave
    e. Marcia is close to her parents
    f. The party is satisfied with the counting results

The existence of de-adjectival *AS*-nominals poses some difficulties for the Grimshaw model. First, we note that of the diagnostics in (22) only those in (33) are clearly applicable to de-adjectival nominals:

33. a. θ-assignors, Obligatory arguments
    d. subjects are arguments
    h. *constant* etc. possible without plural
    (No *agent*-oriented modifiers; no implicit argument control, no aspectual modifiers)

In turn, the derived nominals in (31) do not behave like *R*-nominals either. Their subject is an argument, rather than a possessor, *constant* need not occur with a plural, etc. This state of affairs raises an important issue concerning the generality of Grimshaw's account. If *Ev* is assigned by the derived nominals in (31), the absence of event modification, event control, etc. becomes mysterious. If, on the other hand, *Ev* is not assigned by the derived nominals in (31), the presence of an argument structure identical to that of the source adjectives alongside the non-*R*-nominal properties of (31) must be argued to have a source distinct from the assignment of *Ev*. But if argument structure and non-*R*-properties can be assigned in (31) without an *Ev* argument, then the putative link between *Ev* and argument structure can no longer be generally maintained, and whatever mechanism is developed to account for the properties of (31) would need to be explicitly excluded in the domain of nominals derived from verbs.

One could suggest that some derived nominals assign *Ev-stative* while others are assigned *Ev-eventive*. In Grimshaw's system, however, such assignment would have to be stated entirely independently of the derivational history of the relevant nouns, making the fact that stative interpretation is associated with nouns derived from adjectives, but not with nouns derived from verbs (and vice verse) a pure coincidence. In turn, of

course, it could be suggested that the derived nominal inherits the nature of the *Ev* argument from the source verb or adjective, making a noun derived from an (eventive) verb *eventive,* and a noun derived from an adjective *stative*. That, of course, would be a fully workable solution, but here, again the conclusion must be that the source of any event interpretation as well as argument structure cannot be the derived nominal itself, but must be related in some fashion to the verb/adjective from which it is derived.

Suppose, then, that we assume that the arguments as well as the type of event involved are related in some crucial sense to the event complex dominated by the *AS*-nominal, an event complex which is headed by the very L-stem which incorporates into the nominalizer. What would be the ramifications of such an approach? Note that it has immediate ramifications for the level of phonological abstractness of EIs, or, for that matter, lexical items. To the extent that *AS*-nominals are precisely those which are morphologically derived from phonologically attested verbs or adjectives, and reflect directly a morpho-phonological relationship with them, we must assume that at least in this case, we are dealing with phonologically concrete objects, and not just with an abstract set of semantic or conceptual features. To see that this is so, consider the following hypothetical derivation:

34. a. EI: [$_{TRANSFORM}$] $\rightarrow$ [$_V$TRANSFORM] $\rightarrow$ */transform/*

    b. [$_V$ TRANSFORM]+NOM $\rightarrow$ [$_N$TRANSFORMATION] $\rightarrow$ */transformation/*

    c. [$_N$ TRANSFORMATION]$\rightarrow$ */metamorphosis/; /shift/; /turn/* (etc.)

Suppose, specifically, that an EI with the semantic and conceptual properties of [$_{TRANSFORM}$] is inserted into an appropriate verbalizing structure, giving rise to [$_V$TRANSFORM]. Still maintaining its conceptual and semantic nature, now also associated with the syntactic category V, but still devoid of any phonological specification, [$_V$TRANSFORM] may now give rise to [$_N$TRANSFORMATION], associated with conceptual and semantic structure, as well as a category, but no phonological, or morpho-phonological information. However, whatever semantic and conceptual properties are associated with the noun [$_N$TRANSFORMATION] are also associated with [$_N$ SHIFT], [$_N$ METAMORPHOSIS] or [$_N$ TURN], making the phonology of any of these nouns a proper phonological form for [$_N$TRANSFORMATION], in some post-derivational component. In turn, however, the derivation in (34c) must be blocked. If it is allowed, we would predict, contrary to fact, that *metamorphosis/shift/turn* may have argument structure associated with the event complex headed by [$_V$TRANSFORM]. While any ad hoc blocking of (34c) is, of course, possible, the near total absence of any such correlations, that is, the absence of phonological realizations for *AS*-nominals which do not record an actual morpho-phonological history of having been derived from a verb or an

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adjective, cannot be explained unless we assume that representations such as (34) must be rejected and replaced, at the very minimum, with the representations in (35), where π is a reference to an indexed phonological representation of some abstraction, and where EIs are sets referring both to some semantic/conceptual features and to some such phonological index:[12]

35. a. EI: (TRANSFORM, π) $\rightarrow$ ([$_V$ TRANSFORM], π) $\rightarrow$ */transform/*

    b. ([$_V$ TRANSFORM], π)+NOM $\rightarrow$ ([$_N$ TRANSFORMATION], π) $\rightarrow$
       /transformation/

    c. ([$_N$ TRANSFORMATION], π) $\rightarrow$ **/metamorphosis/,/shift/, /turn/*)

    The contrasts in (36)-(37) illustrate a similar effect in Hebrew. *Transformacia* is a borrowed word, meaning 'transformation'. *Šinui* is a (native Hebrew) nominal, derived from the verb *šina*, 'change, transform'. While the latter can occur both as an *AS*-nominal and as an *R*-nominal, the former, without any morpho-phonological derivational history in the language, can occur only as an *R*-nominal:

36.a. ha-šinui šel merkaz ha-'ir 'al yedey ha-'iriya
       the-transformation/change of center the-city by city hall
   b. ha-šinuy haya madhim
      the-change/transformation was amazing

37.a. *ha-transformacia šel merkaz ha-'ir 'al yedey ha-'iriya
       the-transformation of center the-city by city hall
   b. ha-transformacia hayta madhima
      the-transformation was amazing

    The assumption that event structure in *AS*-nominals is associated with the verbal or the adjectival stem in turn has other consequences. As verbs and adjectives, themselves EIs, cannot have arguments as such, it follows that we must assume, within *AS*-nominals, a fully projected event complex, complete with whatever functional structure is responsible for the projection of argument structure. At the minimum, then, *breaking*, or *destruction* when occurring as an *AS*-nominals, must embed a structure that includes not only *break* or *destroy*, but also a full VP and a full functional structure associated with whatever arguments *break* or *destroy* would otherwise be associated

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[12] A reviewer objects that *metamorphosis, shift, turn* and *transformation* might, in actuality, be sufficiently semantically distinct so as to make their interchanging in (35) impossible. We note that while one may subscribe to the view that true synonyms do not exist, and every encyclopedic entry, or lexical entry is maximally unique, at least the Hebrew example below shows that what is at stake here is very clearly the derivational history, and not the cluster of relevant meanings.

with. If we assume that e.g., (38) is the structure associated with *break* (transitive) or *destroy*, then we must assume that the structure in (39) is associated with the *AS*-nominals *breaking* or *destruction*:

38. a. Kim broke/destroyed the vase
    b. [$_{EP}$ *Kim* [$_{TP}$ [$_{ASPQ}$ *the vase* [$_{L-D}$ *break/destroy*]]]]   (L-D → VP)
39. a. Kim's breaking/destruction of the vase
    b. [$_{NP}$ -*tion*$_{NOM}$/-*ing*$_{NOM}$ [$_{EP}$ *Kim* [$_{ASPQ}$ *the vase* [$_{L-D}$*break/destroy*]]]] (L-D → VP)

   In accordance with an already established practice, L-D in (38)-(39) would become a VP, verbalized by ASP$_Q$, and *break* or *destroy,* its head, will become a verb. Argument structure and event interpretation will emerge exactly as they do for active proposition with *break* or *destroy*, having an identical structure (TP aside). In turn, we may assume, for concreteness sake, that the verb, be it *break* or *destroy* merges copies through the successive functional heads in (39) to -*ing*$_{NOM}$ or -*ation*$_{NOM}$, where *breaking* or *destruction* emerge, following the association of the appropriate morphological structure with the output of the head-to-head movement.

   The evidence for the fact that the argument structure, for derived nominals, comes from the presence of some structure external to the nominal itself is surprisingly simple and straightforward. Consider, specifically, *R*-nominals, as in (40):

40. a. the destruction was devastating
    b. the examination is over
    c. the formation is complete

   R-nominals, by definition, do not have an *Ev* interpretation, and do not have an event argument structure. Yet, morphologically, they are clearly very much the same creatures as *AS*-nominals, and must be assumed to be derived, morphologically, in an identical fashion. If we take the relevant morphological structure deriving both *AS*-nominals and *R*-nominals to be as in (8a-b), we can assume that morphological structure to be associated with the output of head-to-head movement in (39), but to be associated directly with some EI, within the conceptual array, in the case of *R*-nominals, as illustrated, for *formalize*, by (9b). Effectively, this means that a category neutral EI such as *form*, residing in the L-domain of (41a) as part of the conceptual array, may be associated, in the L-D, with an inserted nominal (and verbalizing) affix –*ation*, a member of the functional lexicon, to give rise to the structure in (41b). Of course, following the insertion of the relevant morphological structure *formation* is an N. If it is to become the

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head of L-D, it will force the existence of an NP, and would only allow the projection of nominalizing functional structure, e.g., DP, NumP, etc., but not the projection of verbalizing functional structure, such as TP or ASP_Q:

41.a. [$_{L\text{-}D}$ *form*   ]   b. [$_{L\text{-}D}$ N   ]

                                                                form   *-ation*

   c. ([$_{DP}$) ([$_{NumP}$) [$_{NP}$ *formation*]
   d. *[$_{TP}$ [$_{ASPQ}$ [$_{NP}$ *formation*]

     That *formation*, as an *R*-nominal, does not have any argument structure in the representation in (41) emerges directly from the derivation. There is no argument structure here, quite simply because the nominalization was, so to speak, too low, and any attempt to add argument structure to it would involve the projection of structure that is incompatible with the existence of an N-head. Nothing else needs to be said. Much, however, must be said - and has been said - by any theory which assumes that either verbs or nouns assign argument roles, be they eventive or otherwise. Such theories must assume either that nouns are special in that their argument assignment properties are optional, unlike verbs in general, or the verbs from which they are directly derived (in essence Chomsky, 1970 and much subsequent literature) or alternatively, as Grimshaw assumes, that nouns are ambiguous, and that they are not related, argument-wise, to their source verbs. None of these complications, with their empirical and conceptual inadequacies, emerge if we assume that neither the noun *formation*, nor the verb *form* embedded within it have any arguments to assign.

     Supposing this to be on the right track, there is a VP (or an AP) inside all *AS*-Nominals, alongside full functional event structure similar to that otherwise attested in propositions. On the other hand, *R*-nominals are simple nominal structures, with a nominalizing morphological structure as well as whatever compatible functional structure may co-exist with it.

     That there is, indeed, a VP inside derived nominals has been, in turn, argued for extensively in a broad range of languages, including French (Valois, 1991), Hebrew (Hazout, 1990, 1995; Borer, 1993), Chinese (Fu, 1994), Russian (Schoorlemmer,1995) among many others, as well as most recently for English (Fu, Roeper and Borer, 2001), and I will assume the fundamental correctness of these approaches. Suppose we turn, however, to another question concerning the relations between particular nominalizing affixes and the resulting properties of *AS*-nominals. Grimshaw (1990) claims that *–ation* nominals are always ambiguous between an *Ev* and an *R*

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reading, that *–ing* nominals are always *Ev* nominals, and that $\varnothing$-derived nominals are always *R*-nominals, thus crucially linking the $\pm Ev$ property with nominalizers, rather than the stems from which they are derived. As I have now argued that event structure is never associated with nominals, but specifically with the event complex which is headed by the incorporated L-stem, these generalizations, if indeed correct, must be explained.

5. Do N-affixes determine event structure?

It has been claimed by Grimshaw (op. cit.) and others that different nominalizing affixes have different effect on the output derived nominals, and that specifically, the picture in (42) holds, such that $\varnothing$-nominalizers only give rise to *R*-nominals, *-ing* nominalizers only give rise to *AS*-nominals, and *–ation* is ambiguous. That $\varnothing$-nominalizers, with few exceptions, do, indeed, give rise to *R*-nominals is very clear from the data in (43): [13]

42. Grimshaw: $\varnothing(\boldsymbol{R})$; *-ation*($\{\boldsymbol{R},\boldsymbol{Ev}\}$); *-ing*($\boldsymbol{Ev}$)
43. a. *the/John's drive of this car
    b. *the/Mary's walk of this dog
    c. *The/Kim's break of the vase
    d. *the airforce's murder of innocent civilians

It is less than obvious, however, that Grimshaw is correct in suggesting that *–ing* nominals are always *Ev* nominals, *AS*-nominals in our terms. Certainly, the *–ing* nominals in (44) are not **result** nominals, but as we have already seen, *R*-nominals need not be result nominals, and may be, instead, event nominals, or as the case appears to be at least for some of the nominals in (44), nominals denoting state.

44. a. *a good living, a strong craving, a strong beating, a reading, (leftist) leaning, (good) standing, (one) sitting,* etc
    b. "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
    c. (this kind of) *fighting, fraternizing, parenting, writing* etc.

In turn, if, indeed, both *–ing* and *–ation* allow freely *AS*-nominals and *R*-nominals, showing that at least for these two affixes the choice of N-affix

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[13]Alas, like all generalizations concerning WF, this one, too, has counterexamples. Thus while at least some speakers reject (i)-(iii), others find them acceptable:
   i. My constant change of mentors from 1992-1997
   ii. The frequent release of the prisoners by the governor
   iii. The frequent use of sharp tools by underage children

is not the determinant of event structure, an important question concerns the absence of an *AS*-Nominal reading for Ø-nominalization, especially since at least prima facie, the relationship with the source verb is the most transparent, at least in (43a-c), and most so-called Ø-derived nominals do, indeed, have a salient event denotation:

45. a. the walk lasted for five hours
    b. the jump occurred before dawn
    c. the (responsive) read took place in the law review office
I suggested that the structure for *AS*-nominals with either *–ing* or *–ation* is in essence as in (39b). It would appear, then, that for some reason, the structure in (46) is not available, although the structure in (47), that of *R*-nominal with Ø, is available:

46. [$_{NP}$Ø$_{NOM}$ [$_{EP}$ *Kim* [$_{ASPQ}$ *the vase* [$_{L-D}$ *break*]]]] (L-D $\rightarrow$ VP)

47. [$_N$ [$_V$ *break*] Ø]

    Viewed differently, however, the absence of *AS*-nominals with Ø-morphology is fully explained, if we assume that what appears as a Ø-morpheme is in actuality a category neutral stem, unmarked for being either a noun or a verb. In effect, we suggest, English does not have a Ø-morpheme which mediates conversion from verbs to nouns or from nouns to verbs. Rather, English has category neutral EIs, inserted into particular structures which render them verbs or nouns, syntactically. Consider, specifically, how such an account would work for the absence of *AS*-nominals with neutral stems, taking *break* as an example. For *R*-nominals, the derivation is straightforward. Rather than assume a Ø-affix, as in (47), consider instead a derivation in which a category neutral EI is inserted in L-D, and L-D becomes an NP as it is embedded under nominal functional structure (e.g., DP):

48. a. [$_{L-D}$ *break*]
    b. [$_D$ *the*   [$_{L-D}$ *break*] L-D $\rightarrow$ NP, [$_L$ *break*] $\rightarrow$ [$_N$ *break*]
The derivation of a verbal *break,* within a propositional context, is likewise straightforward. As soon as ASP$_Q$ (or TP) project, L-D will be verbalized, and one of its constituents will be targeted as a possible head, in turn verbalized as well:

49. a. [$_{L-D}$ *break, Kim, vase*]
    b. [$_{ASPQ}$ *the vase* [$_{L-D}$ *break, Kim,* [$_{DP}$ ~~*vase*~~]]
       L-D $\rightarrow$ VP, [$_L$ *break*] $\rightarrow$ [$_V$ *break*]

    Consider, however, *AS*-nominals. We suggested that a full VP event complex is projected within *AS*-nominals. This means that for a nominal

such as *the breaking of the vase,* the merger of an ASP$_Q$ with L-D is essential, to give a landing site for *the vase*. Likewise, a *subject-of-quantity* argument associated with *break* must project in the specifier of ASP$_Q$. Thus in attempting to derive (43d), we must start by projecting the structure in (50):

50. [$_{EP}$ *Kim* [$_{ASPQ}$ *the vase* [$_{VP}$ [$_V$*break*], [$_{DP}$***Kim***], [$_{DP}$ ***vase***]]

As in the case of (49b), ASP$_Q$ will verbalize L-D as well as its head, *break*. If, e.g., *–ing* merges above EP in (50), an *AS*-nominals does emerge. However, if indeed English does not have Ø-nominalizers, and all Ø-alternations between verbs and nouns are instances of category-neutral stems, the representation in (50) cannot become nominalized without an overt nominalizer, and an *AS*-nominal derivation for [$_N$*break*] is expected to never occur. As in the case of the missing arguments for *R*-nominals, here as well it is hard to see how a theory which attributes role assignment to lexical entries can likewise capture these facts.

6. More on the absence of Ø noun-verb alternations

We have, now, an interesting prediction. If, indeed, English does not have Ø-categorizing morphology, and all stems that appear to alternate between categorial types are, in actuality, category neutral stems categorized by the syntactic structure, we predict that the great freedom attested in English which allows any noun to be inserted in a verbal frame and any verb to be inserted in a nominal frame should be only attested with respect to category neutral stems, which is to say, stems that are not associated with any category morphology.

That this is indeed the case, can be immediately illustrated by the ungrammaticality of (51b-c):

51. a. *form, floor, table, chair, run, kiss, break, closet, wardrobe, telephone, brother, dog, cat*; etc.
    b. **a formalize, *a fatten, *an enclose, *a bemoan* etc.
    c. **to formation, *to brotherhood, *to government*;

The generalization here cannot be based on morphological complexity. Note that the forms in (52) are morphologically complex:

52. *rerun, rebound, transport, import, export, subcontract*

Further, note that primary compounds do display a Ø N⇔V alternation:

53. a. to grandstand, to blackboard, to chicken-wire, to wall-paper etc.
    b. a white-out, a take-off, a sell-out, a buy-up; a take-over, etc.

Rather, it seems that Ø N⇔V alternations are possible providing the morphological head is a category neutral EI. As prefixes in English do not

change category, and neither do particles, as in (53b), the head remains a category neural stem. Likewise, in primary compounds, the head, the right member, may be category neutral (but not so in synthetic compounds, note). Some illustrations of primary compounds that cannot enter Ø N⇔V alternations precisely because the right stem, the head, is not category neutral, as in (54):

54. *to company executive; *to compound director; *to school teacher; *to university professor*; etc.

The derivation for primary compounds as verbs such, as *wallpaper* is given in (55). We may assume, specifically, that both *wall* and *paper* are members of the conceptual array, being compounded by a morphological rule. In turn, the morphological rule assigns a morphological head status to the right stem, and either an N or an A category to the left stem. In turn, the entire compound, if headed by a category neutral EI, is categorized by the functional structure, as in (55b):[14]

55. a. [L *wall…*] [L *paper*]
   b. [L [A/N *wall*] [L *paper*]]   (by the compounding rule)
       i. [D   [L [A/N *wall*] [L *paper*]]   L → N
       ii. [Asp   [L [A/N *wall*] [L *paper*]]   L → V

Note that the structure in (55a-b) would be the identical one to that assigned to exocentric compounds, in essence putting forth the claim that all primary compounds in English with underived right member are syntactically exocentric.

While, of course, some counterexamples do exist, we note that of approximately 1300 denominal verbs studied by Clark and Clark (1979) and excluding instrumentals, there is a total of six counterexamples to the claim that nouns with categorial morphology do not participate in Ø-N⇔ V alternations: *to launderette, to laundress, to blockade, to allowance, to tourist,* and *to lover* (other than *blockade,* all rejected by native speakers). In the instrumental class, 12 out of 117 forms listed as possible verbs are derived, including *to elevator, to accelerator, to stopper, to trailer, to glider*, and others, very clearly re-analyzed and re-entered as independent EI.[15],[16]

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[14] But see fn. 6 on the possibility that adjectives are never categorized by the structure, leaving N as the only possibility for the left member in (55).

[15] Kiparsky (1982) argues that the Ø-affix converting verbs to nouns is unproductive and belongs to Level I morphology, while the Ø-affix converting nouns to verbs is fully productive and belongs to Level II morphology. The examples in (53b) as well as those in (54) are a straightforward counter-example to the level ordering assumed by Kiparsky, as is

7. On the Growth-Potential of Theories Based on *growth*

The account for the properties of *R*-nominals as well as for the absence of an *AS*-nominal reading for '∅-derived' nominals relied heavily on two assumptions. The first concerned the claim that EI, as such, do not have any formal syntactic or morphological properties. To varying degrees, this claim is the defining feature of constructionist as well as neo-constructionist approaches, including the present one. The second the assumption involved the claim that the functional structure which is associated with the assignment of all direct (event) arguments is a verbalizer (or alternatively possibly an adjectivizer), and most specifically, that it cannot be associated with an N-head. This, we note, is not a necessary assumption within a neo-constructionist approach, and in actuality, it does differentiate the account presented here from those put forth by Picallo (1991), Ouhalla (1991), and most recently Marantz (1997) and Alexiadou (1999) (and see also Harley and Noyer, 1998a,b). In all these accounts, which are neo-constructionist to varying degrees, it is assumed that in *AS*-nominals the L-D is headed by an N. To consider specifically Alexiadou (1999), who shares with the analysis presented here both a neo-constructionist approach to category determination, as well as the assumption that *AS*-nominals involve an articulated event structure separating the head from the DP, she nevertheless assumes that the relevant structure fundamentally does not have a verbalizing function, and that for e.g. *destruction of the city*, the structure (somewhat schematically) is as in (56a), where neither ASP (grammatical aspect) nor *v*, in essence an event licensing node (but not an external role assignor), are verbalizers, and hence L may be realized in situ as an N, and LP as NP, if dominated by a DP. In turn, non-event nominals involve the

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the ungrammaticality of *to transformation* and *to professor*. We also note that contra Kiparsky, V→ N alternations are extremely common and spontaneously produced on a regular basis, including cases which one would assume should be prohibited by blocking, such as *give it a think*. See Borer, forthcoming, for a fuller review.

[16] We note as an open issue here the mixed behavior of forms such as those in (i), where we have the appearance of a the nominal suffix *–tion*, but where there is no source morphological L-stem (or in turn, a source so drifted in meaning so as to give rise to the plausible assumption that the form has been entered separately in the encyclopedia from its erstwhile morpho-phonological source, as in the case of *proposition*). While some of these forms easily lend themselves to 'verbalizations', others seem more resistant, for reasons that do not seem obvious:

i.   a. *to portion, to position, to condition, to proposition, to audition, to ration, to question*, *to motion*
      b. **to nation, *to ambition, *to potion, *to notion*

projection of a DP structure without the event node *v* (and without grammatical aspect) schematically as in (56b):[17]

56. a. $[_{DP}[_{ASP}$ $[_v$ $[_{LP}$ $\sqrt{destroy}$ *the city(theme)* $]]]]$ L$\rightarrow$ N
     b. $[_{DP}$………. $[_{LP}$ $\sqrt{destroy}$ $]]]$ L$\rightarrow$ N

Structures such as those in (56) fail, I believe, in two crucial ways. First, they entirely fail to predict the fact that only nominals that are morphologically derived from verbs (or from adjectives) may give rise to *AS*-nominals. There is nothing in the structure in (56a) which allows it to be sensitive to any morpho-phonological considerations. $\sqrt{destroy}$ is nominalized in the context of DP, on a par with the nominalization of $[_N dog]$ or $[_N table]$ or $[_N transformation]$, or, for that matter, on a par with the nominalization of $\sqrt{destroy}$ in the *R*-nominal in (56b). Secondly, the representations in (56) entirely fails to predict the fact that Ø-alternations cannot occur as *AS*-nominals.

Ironically, (56a-b), at first sight so different from the lexicalist approach put forth by Grimshaw (1990), fail precisely where Grimshaw (1990) fails. Upon a closer look, this is not surprising, as they representit is a syntactic execution of her very idea, endowing some nominals, but not others, with event structure. Both Grimshaw's (1990) analysis and Alexiadou (1999)'s structures thus differ from the analysis presented here, whereby event structure is never associated with N, as such, but is always a property of an event structure embedded under a nominal head and associated with a distinct lexical head.

The analysis put forth by Alexiadou (1999) shares one more property with Grimshaw's account, in disallowing in principle, the projection of an external argument within *AS*-nominals. For Alexiadou (1999), following Marantz (1997), this follows from the fact that while neither *v*P nor EP in (56a) are verbalizers, a *v* which assigns an external argument is a verbalizer. Thus when such a node projects, a root embedded under it would become a v, rather than an N, and a derived nominal, quite simply, would not emerge. In the analysis proposed here, and regardless of whether or not *v* is, indeed, the relevant functional structure for the licensing of an external argument, nominalization crucially occurs above the event complex, which is always a verbalizer, and is possible because it gives rise to a verbal event complex

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[17] Note that Alexiadou (1999), following Marantz (1997) also continues to subscribe to the view that internal arguments (but not external ones) are assigned by the root (our EI), and not through the structure, thereby requiring a special mechanism to allow its omission in *R*-nominals, involving, specifically, the presence vs. absence of structural case.

embedded within a nominal structure. Thus there is little reason to assume that in principle external arguments are not possible within *AS*-nominals, contra Marantz (1997) and Alexiadou (1999).

Empirically, much of the support for the absence of external arguments within *AS*-nominals comes from Chomsky's (1970) account for the well-known ungrammaticality of (58a) with a transitive interpretation, as well as the ungrammaticality of (58b-c):

57. a. The farmer grew the tomatoes
    b. The tomatoes grew
58. a. The growth of tomatoes (intransitive reading only)
    b. *the farmer's growth of tomatoes
    c. *the growth of tomatoes by the farmer

Chomsky (1970), and following him, Marantz (1997), suggest that the ungrammaticality of (58a) with a transitive reading as well as the ungrammaticality of (58b-c) derive from the fact that transitive *grow* is, in actuality, a complex form consisting of CAUSE+*grow*. If one assumes that CAUSE is an abstract entry which assigns an external *causer* role, say *v,* and that *v* is a verbalizer, it follows, for Marantz (1997), that *v* cannot occur within *AS*-nominals, as its projection would lead immediately to the verbalization of the root embedded underneath it, blocking a nominal. Hence, the only possible derivation for *grow* would be one which does not involve *v*, i.e., an intransitive derivation.

Marantz notes, nevertheless, that (59b) is grammatical, as is (59a) with a transitive derivation:

59. a. the destruction of the city
    b. the enemy's destruction of the city

To accommodate this, he assumes, along lines assumed by Grimshaw (1990) for similar structures, that *the enemy's* in (59b) is a possessor, and that the possessor may have a free interpretation in cases such as (59), including an interpretation that happens to coincide with that of *agent*. That such an interpretation is barred for (58) follows, in turn, from the lexical semantics of the root *grow* which requires an *external causer*, not a possible interpretation for the possessor.[18]

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[18] We note that by appealing to the lexical semantics of *grow* to exclude (58) Marantz effectively resurrects a lexical semantics for roots which determines not only the internal argument of an emerging form, but also its external argument, if only by means of excluding

There are a number of problems with the analysis, however, not the least of which being the grammaticality of (60) (and see also (61) as well) already noted by Chomsky (1970) as problematic for the CAUSE analysis which he, himself, proposes:

60. a. Mary's growing of the tomatoes
    b. The growing of the tomatoes (ambiguous)
61. a. The navy's sinking of the ship
    b. Bill's melting of the wax
    c. Kim's breaking of the vase

Nor is the grammaticality of (60)-(61) an artifact of some putative difference between –*ing* nominals and others (see Marantz, 1999). Harely and Noyer (1998a), investigating precisely this issue, cite the following examples in which an external argument interpreted as an *external causer* does appear licensed within *AS*-nominals with –*ation* nominalizers, in contrast with (58):

62. a. Kim's accumulation of dust
    b. The accumulation of dust (ambiguous)
    c. Robin's separation of Kim and Pat
    d. The separation of Kim and Pat (ambiguous)
    e. The government's unification of the city
    f. The unification of the city (ambiguous)

And finally, a restriction against an external argument within *AS*-nominals as deriving from the impossibility of the projection of *v* has the hallmark of a linguistic universal. However in Hebrew where the forms for transitive *grow* and intransitive *grow* are morpho-phonologically related, but distinct, and each has a separate derived nominal, both are attested without any resulting ungrammaticality:

63. a. gidul   ha-'agvaniyot ('al yedey ha-'ikarim)
       growth.trans   the-tomatoes   (by farmers)
       'The growing(trans) of tomatoes'
    b. gdilat   ha-'agvaniyot
       growth.intrans   the-tomatoes
       'The growing (intrans) of tomatoes'

We therefore conclude that *growth* is rather isolated in exhibiting the behavior in (58), and that what is called for is an explanation for the exceptionality of *growth,* rather than an account which generalizes from its

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some roots, and thus effectively some syntactic structures, in the context of some types of external arguments.

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properties, thereby making wrong predictions for a broad range of derived nominals. What, then, could possibly be the reason for the ungrammaticality of (58)? Following the lead of Pesetsky (1995), but with a very distinct execution, we would like to propose that the ungrammaticality of (58) has a morpho-phonological, language specific source, and not a syntactic one. We note that Pesetsky's claim, whereby *growth* is ungrammatical because it involves a Ø-affix attached to *grow.intrans* together with the assumption that ∅-affixation blocks all further affixation, could not possibly be adopted, or it would rule out, incorrectly, the transitive *AS*-nominals associated with *accumulation, separation* and *unification,* in a parallel fashion (Pesetsky does assume *–ing* is special).[19]

Rather, I would like to propose that *grow* and *growth* do not represent a derivational relationship, but rather, they are stem allomorphs, much like what we find in *destroy/destruct(ion), prógress/progréss, louse/lice, break/broke* etc. We do not have here an actual derivational process, but rather, the selection of a particular allomorph from a paradigmatic set in particular morpho-phonological or morpho-syntactic environments. Thus *destruct* is a verb allomorph which is inserted in bound contexts, just like *broke* is the stem allomorph that is inserted both in past tense contexts and in bound contexts to give rise to *broken*. On the other hand *eat* is the stem allomorph that is inserted in present tense contexts and in bound contexts, to give rise to *eaten*. In neither case is the form *eat* present or *broke* past, or we would have to claim that *–en* is sometimes attached to past tense forms, and sometimes to present tense forms.

In turn, if *growth* is a stem allomorph inserted in nominal contexts, rather than an actually derived form, then whatever rationale applies to other category-neutral forms must apply to it – it may not be embedded within *AS*-nominals, quite simply because in order for an event complex, an inherent verbalizer, to become nominal, an overt nominalizer is required, but *–th* by definition is not such a nominalizer. Thus *growth,* in actuality, is an *R*-nominal, and *the growth of the tomatoes* has the same properties and the

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[19] The second half of Pesetsky's claim, according to which *annoyance* and similar nominals derived from psyche-predicates cannot be transitive, due to the presence of a Ø-causative affix which blocks -*ance* affixation, could not be adopted because unlike the behavior of *growth,* which is clearly language specific and morpho-phonologically conditioned, the behavior of *annoyance* is not language specific, and is not conditioned by the morpho-phonology. Thus in Hebrew, transitive nominalizations equivalent to *annoyance* are ungrammatical as well, although as in the case of *growth,* no Ø-affix could be assumed, and the transitive form and the intransitive forms are morpho-phonologically distinct.

same structure as *yesterday's/the return of the Jedi (*in a day)* or *the design of the furniture.*

To support this claim, consider the distribution of nominals with *-th* in English which actually have a corresponding noun or adjective:

64. a. *(birth), breath, death, growth, stealth, health* (appears to be an exhaustive list)

b. *width, length, strength, warmth, truth, breadth, dearth* (appears to be an exhaustive list)

The list here is very limited indeed, nor is *–th* in any sense productive in the language. Consider, more strikingly, however, the following forms (with thanks to S. Anderson, p.c.):

65. **length***en,* **strength***en.* (and note also **height, height***en,* R. Kayne, p.c.)

As is well known, *-en* attaches to adjectives to give rise to verbs:

66. *redden, blacken, thicken, fatten, shorten*, etc.

As is further well known, *-en* is morpho-phonologically constrained, and may not attach to adjectives which have a final sonorant, and hence (67):

67. a. *-en* attaches to adjectives   (*[+sonorant]#en)

b. *greenen, **thinen, *bluen,* yellowen, *brownen* etc.

Consider, in view of this, (65). Both *long* and *strong* could not be affixed with *–en*, as both end in a sonorant, and such an affixation would give rise to *longen or **strongen.* Instead, we find *lengthen* and *strengthen*, and also *heighten*, because the adjective *high* is similarly constrained, and here, too, *height* is a stem allomorph. If, now, we assume that *-th* forms are stem allomorphs, inserted, in the case of *lengthen* and *strengthen* in a morpho-phonologically conditioned environment, rather than derived forms, not only do we account for (65), but we also resolve the mystery surrounding the impossibility of (58), without needing to assume that the event complex within *AS*-nominals is different in crucial ways from that attested in propositions.[20]

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[20] Marantz (1997) cite one more case which appears to pattern with *grow*, i.e., that of *rise/raise*, pointing, specifically, to the ungrammaticality of cases such as those (ia), when contrasted with the grammaticality of (ib):

i.   a. *Jane's raise of the crane

b. The rise of the sun

8. By way of summary

By way of summarizing this paper, we consider briefly a number of interesting questions which arise here, in principle, and which are clearly worth pursuing. Note, first, that categories such as V, N, as associated with terminals, may emerge from this picture as not being universal, in the sense that there may be languages which do not distinguish between nouns and verbs on the **terminal** level (i.e., any lexical item may be either a noun or a verb). On the other hand, the distinction between NP and VP is a universal one, and follows from the assumption that the inventory of functional structures is both limited and universal, giving rise to tense, argument structure, DP structure, etc. A stem which is neither a verb nor a noun may exist, but in the context of a VP (so verbalized by functional structure, e.g. TenseP) or in the context of an NP (so nominalized by functional structure, e.g. DetP), they will be formally equivalent to either N or V, by virtue of heading a categorially coherent constituent.

We further note that if the system outlined here concerning the licensing of the past and the future values in English is correct, and if, indeed, we are correct in assuming that functional structure is largely licensed through either the insertion of independent functional morphemes, or through head movement, then these are not inter-grammatical variations, but rather, intra-grammatical variations. This, in turn, raises the distinct possibility that there are no grammar-specific parametric settings, and instead, language variation represents a mix and match of universally available strategies, not always consistently used in any given language, but determined by the arbitrary phonological properties of the inventory of grammatical formatives.

Recalling, now our discussion of the *feed/eat* problem we note that the encyclopedia obviously is not a pure conceptual component but an interface level. At the very least, it has phonological representations which may tease apart some related concepts and list them separately, as arbitrarily determined by a specific language's vocabulary. This, in turn, gives rise to

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Note, however, that (ii) is morphologically well-formed, although it is both morphologically and semantically related to the transitive *raise*, and not to the intransitive *rise*:

ii.   I was given a raise this month

The problem here, then, is that the *raise* does not appear to have an *AS*-nominal derivation, rather on a par, it would appear, with '∅-derived' nominals in general, of which *raise* is certainly one. As such, it patterns exactly with our claim about the nature of *growth*, likewise, we suggested, a '∅-derived' nominal, subject to an allomorphy rule.

typical interface questions. How does the encyclopedia relate to the conceptual system proper, and how many more language specific properties, in addition to phonological index, could it support? At least in the case of idioms, it might appear that some syntactic information might be in order, resulting precisely in the rigidity typically associated with idioms.

And finally, we note, contra many current accounts, that morpho-phonological representation cannot be divorced from the grammar. Any attempt to disenfranchise it, so to speak, is empirically and explanatorily costly, precisely to those very computational systems which its elimination is an attempt to simplify.

References

Alexiadou, A. 1999. *On the Syntax of Nominalization and Possession: Remarks on Patterns of Ergativity*. Habilitation, University of Potsdam.

Anderson, S. 1992. *Amorphous Morphology*. Cambridge, UK: Cambridge University Press.

Baker, M. 1985, 1988. *Incorporation*. Chicago, Illinois: University of Chicago Press.

Borer, H. 1991/1993. "Derived Nominals." Ms., University of Massachusetts, Amherst.

Borer, H., 1994. "The projection of arguments," in E. Benedicto and J. Runner (eds.) *UMOP* 17, GLSA, University of Massachusetts, Amherst.

Borer, H. 1998. "Passive without θ-grid," in S. Lapointe, D. Brentari and P. Farrell (Eds.) *Morphological and Its Relations to Phonology and Syntax*, CSLI, Stanford University.

Borer, H. 2001. *The Exo-Skeletal Trilogy, Books I, II*, Ms. University of Southern California

Borer, H. forthcoming. *The Exo-Skeletal Trilogy, Book III*, Ms., University of Southern California

Carrier, J. and J. Randall, 1992. "The argument structure and syntactic structure of resultatives", *Linguistic Inquiry* 23, 173-234

Chomsky, N. 1965. *Aspects of the Theory of Syntax*, Cambridge, Mass: MIT Press

Chomsky, N. 1970. "Remarks on nominalizations," in R. Jacobs and P. Rosenbaum, P. (eds.) *Readings in English Transformational Grammar*. Waltham, MA: Blaisdell, pp. 184-221.

Clark, E. and Clark, H. 1979. "When nouns surface as verbs", *Language* 55.4, pp. 767-811.

Dowty, D. R. 1991. "Thematic proto-roles and argument selection." *Language* 67:547-619

Fillmore, C. and P. Kay. 1997. *The Formal Architecture of Construction Grammar*, ms., University of California, Berkeley

Fu, J.-Q. 1994. *On Deriving Chinese Derived Nominals*. Ph.D. dissertation, University of Massachusetts, Amherst.

Fu, J., T. Roeper and H. Borer. 2001. "The VP within process nominals", *Natural Language and Linguistic Theory* 19: 549-582.

Goldberg, A. 1995. *Constructions: A Construction Grammar approach to argument structure.* Chicago, Illinois: University of Chicago Press.

Grimshaw, J. 1990. *Argument Structure.* Cambridge, Mass: MIT Press,

Harley, H., 1995. *Subject, Events and Licensing*, Ph.D. dissertation, MIT.

Harley, H. and R. Noyer. 1998a. "Formal vs. encyclopedic properties of vocabulary: evidence from nominalizations," ms., University of Pennsylvania.

Harley, H. and R. Noyer. 1998b. "Mixed nominalizations, object shift and short verb movement in English", in Proceedings of NELS 28, University of Massachusetts at Amherst: GLSA

Hazout, I. 1991. *Verbal nouns: theta theoretic studies in Hebrew and Arabic*. Ph.D. Dissertation, University of Massachusetts, Amherst.

Hazout, I. 1995. "Action nominalization and the Lexicalist Hypothesis." *Natural Language and Linguistic Theory* 13: 355-404.

Hout, A., van. 1992. "Linking and projection based on event structure", ms, Tilburg: Tilburg University.

Hout, A., van. 1996. *Event Semantics of Verb Frame Alternations*, TILDIL Dissertation Series, 1996-1.

Jackendoff, R. 1990. *Semantic Structure,* Cambridge, Mass: MIT Press.

Johnson, K. 1991. "Object positions," *Natural Language and Linguistic Theory* 9, 577-636.

Kiparsky, P. 1982. *Lexical Phonology and Morphology*, ms., MIT.

Kratzer, A. 1994. *The Event Argument*, ms., Amherst: University of Massachusetts.

Kratzer, A. 1996. "Severing the external argument from the verb", in J. Orrick, and L. Zaring (eds.) *Phrase structure and the Lexicon*, [Studies in Natural Language and Linguistic Theory] Dordrecht: Kluwer.

Krifka, M. 1992. "Thematic relations as links between nominal reference and temporal constitution." In Ivan A. Sag and Anna Szablocsi (eds.) *Lexical Matters*. Stanford: CSLI

Levin, B. and M. Rappaport-Hovav, 1995. *Unaccusativity*. Cambridge, Mass: MIT Press.

Marantz, A. 1996. "Cat as a phrasal category", ms., MIT.

Marantz, A. 1997. "No Escape from Syntax," In A. Dimitriadis, I. Siegel et. al, (eds.) *University of Pennsylvania Working Papers in Linguistics*. 4.2., pp. 201-225.

Marantz, A. 1999. *Lecture Notes*. MIT, Cambridge.

Ouhalla, J. 1991. *Functional Categories and Parametric Variations*. London: Routledge.

Pesetsky, D. 1995. *Zero Syntax*. Cambridge, Mass: MIT Press.

Picallo, C. 1991. "Nominals and nominalization in Catalan", *Probus* 3: 279-316.

Reichenbach, H. 1947. *Elements of Symbolic Logic*, New York: McMillan.

Reinhart, T. 1996. "Syntactic effects on lexical operations: reflexives and unaccusatives. Utrecht University, Utrecht: UiL OTS Working papers

Reinhart, T. 2000. "The theta system: syntactic realization of verbal concepts," Utrecht University, Utrecht: UiL OTS Working papers.

Runner, J. 1995. *Noun Phrase Licensing and Interpretation*, Ph.D.. dissertation, University of Massachusetts, Amherst.

Schoorlemmer, M. 1995. *Participial Pawsive and Aspect in Russian.* Ph.D. dissertation, Utrecht University.

Sciullo, A.-M. di and E. Williams. 1987. *On the Definition of Word.* Cambridge, Mass: MIT Press.

Valois, D. 1991. The internal structure of DP, Ph.D. dissertation, University of California, Los Angeles.

Williams, E. 1981. "Argument Structure and morphology", *The Linguistic Review* 1, 81-114

Zucchi, A. 1989. *The Language of Propositions and Events: Issues in the Syntax and Semantics of Nominalization*, Ph.D.. dissertation, University of Massachusetts, Amherst.

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