

Nominalizations: A Probe into the Architecture of Grammar Part I: The Nominalization Puzzle

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Abstract

Nominalizations have remained in the center of linguistic discussion at least since 1960, and one might be correct in stating that they are still much of a puzzle. In this paper, I offer a partial historical overview of the literature on nominalizations, beginning with a discussion of Chomsky's Remarks on nominalization, surveying the lexicon vs. syntax debate that characterized the research in this area during the 80s and 90s, and concluding with the presentation of some work that focuses on event structure and aspectual properties of nominalizations.

1. Introduction

It is often said that the classification of words into distinct categories or 'parts of speech' is one of the oldest linguistic discoveries, going back to at least Dionysius Thrax. Dionysius classified parts of speech into main two categories, nouns and verbs. The former inflect for case; the latter, for person and tense. From a semantic point of view, verbs denote events and take arguments (participants in the event), while nouns are referential expressions denoting concrete entities.

In spite of this long tradition, as pointed out by Baker (2005), linguists still disagree as to how exactly these primitives are defined, and whether they are primitives at all (see e.g. Ross 1972; Borer 2005; Marantz 1997 and subsequent work, Kayne 2008). In addition to this general classification problem, there exists a class of constructions referred to as *trans-categorical* or simply *mixed category* constructions, which poses a more severe problem, as it involves elements that seem to be core members of more than one category simultaneously. One of these constructions is nominalizations, and this paper deals with the problems they raise for linguistic theory.

Nominalizations have remained in the center of linguistic discussion at least since 1960, and one might be correct in stating that they are still much of a puzzle. What is the source of our fascination and bewilderment with nominalizations? Let me illustrate this with the following example. At a superficial level, the example in (1a) is similar to the one in (1b):

- (1) a. The teacher's examination of the students went on for 3 hours *derived nominal*
b. The teacher examined the students.

In (1a), although a noun, *examination* behaves like the verb *examine* in that it takes two arguments (*the teacher*, *the students*). Specifically, in both (1a) and (1b), *the teacher* is felt to be the Agent of the act of examining, and *the students* is interpreted as the Patient. In addition, the noun *examination* is morphologically related to the verb *examine*. The obvious difference between the two has to do with the fact that the nominalization externally behaves as a noun, as it can occupy an argument position in its own right. This is suggestive of a mixed categorial behavior (nominal and verbal).

How can the mixed properties of nominalization be accounted for? Lees (1960) proposed that derived nominals are both deverbal and desentential, i.e. basically (1a) is derived from (1b) via a number of transformations. While this was the prevailing analysis of nominalizations up to 1970, it soon became clear that matters are not that simple. To begin with, (1a) is not the only possible construction that relates to (1b). Along with (1a), the nouns (2) can also be formed:^{1,2}

- (2) The teacher's examining of the students *mixed nominal*
- (3) a. The teacher's examining them *gerund*
 b. The teacher/Him examining them
 c. Examining them

In fact, (3) seem more verbal than (1a) and (2), as in these examples the internal argument *them* receives the same case marking as its verbal counterpart, namely accusative. To make matters worse, the noun *examination* does not need to appear with any arguments. This is impossible, however, for the verb *examine*:

- (4) a. We were shocked by the results of the examination.
 b. *We examined.

This simple paradigm makes clear where the problems lie. On the one hand, we observe a semantic similarity and a morphological relationship between the verb and the nominals that can be derived from it. On the other hand, however, the noun is simply not quite like the verb in a number of ways.

First, it does not obligatorily license arguments. For this reason, several linguists, e.g. Anderson (1983), Higginbotham (1983), Dowty (1989), and more recently Kayne (2008) among others, argued that nouns crucially differ from verbs in that the former, unlike the latter, do not take arguments. Their reasoning is as follows. Given that nouns fundamentally differ from verbs in that they only optionally take arguments, they must lack argument structure (AS) altogether. Others, as we will see in the next section, have argued that either nouns inherit the ASs of their corresponding verbs, or optionally do so.

Second, more than one nominal form corresponds to the same verb, and it is unclear whether these forms are systematically related to one another and to the verb. More important is how they differ from one another. In addition, if verbs and nouns are considered primitives of grammar, items that show a mixed categorial behavior are a puzzle, as it is not clear how they can be incorporated within our general theory of grammar.

In this paper, I present the way our view on nominalizations has developed during the last 40 years. I mainly focus on deverbal nominalizations (see Roy (forthcoming) on de-adjectival nominalizations) and their analysis within the generative tradition here (see Hudson 2003; Heyvaert 2003 for discussion of nominalizations in other frameworks; see Koptjevskaja-Tamm 1993 for a comprehensive typological study).³

In view of the richness of the discussion, the discussion is divided into two parts. Part I is structured as follows: In section 2, I discuss the impact of Chomsky's (1970) *Remarks on Nominalization*. In section 3, I turn to the lexicon vs. syntax debate that characterized the research during the 80s and 90s. In section 4, I will be focusing on Grimshaw's (1990) event structure perspective. In section 5, I will turn to recent observations concerning nominalization and event structure. In part II, I will first provide lexicalist and syntactic accounts of the empirical observations on aspect made in part I, before turning to a discussion of some open issues. Finally, I will offer some general conclusions.

Sections 2–4 of part I are rather brief, as by now a number of good sources for these matters exist, and I do not intend to re-summarize them here. Some recent overview articles/books include Alexiadou (2001), Alexiadou et al. (2007), Alexiadou and Grimshaw (2008), Newmeyer (2008), Roeper (2006), Siloni (1997), Borer (2003, Forthcoming), Ackema and Neeleman (2004); the contributions in Borsley (2000), Alexiadou and Rathert (Forthcoming), Kornfilt and Whitman (Forthcoming), and in Giannakidou and Rathert (2009).

2. The Impact of ‘Remarks on Nominalization’

The way of viewing the paradigm in (1–3) crucially changed in 1970, following the publication of Chomsky’s *Remarks on Nominalization*. Chomsky pointed out that the nouns in (1)–(3) are not equal. While gerunds are clearly deverbal, derived nominals and mixed nominals have more nominal properties, in the sense that their internal structure looks like that of a simple noun, as opposed to gerunds. This is manifested by the fact that they e.g. take a prepositional phrase as a complement, they can be introduced by determiners, and they can be modified by adjectives and do not license negation and auxiliaries. See (5) for an example of a derived nominal.

- (5) a. the stupid refusal of the offer
- b. *the refusal stupidly of the offer
- c. *the not refusal of the offer
- d. *the have refusal of the offer

A second point raised by Chomsky is that the semantic relations between the associated sentence and the derived nominal are quite varied and idiosyncratic. On the contrary, the properties of the gerunds are transparently those of the underlying verbal element, e.g., while both the verb *ignore* and the gerund *ignoring* have the meaning ‘pay no attention to’, *ignorance* has a different meaning (lack of knowledge).

While the verbal nature of gerunds was never a point of controversy, the proper analysis of derived nominals and mixed nominals is a much-debated issue.⁴ The problem is that if both gerunds and derived/mixed nominals are derived in the same way in the syntactic component, then the more verbal nature of gerunds is unexpected. Thus, Chomsky concluded that derived nominals are not desentential (i.e. not derived via transformation from the associated sentence), as opposed to gerunds.

3. Lexicon vs. Syntax

Chomsky’s paper made the claim that the similarity between *John refused to come* and *John’s refusal to come* is not derived transformationally but lexically, where lexically is understood as follows: ‘by appeal to the subcategorization and selectional and semantic features of a single item *refuse* which is neutral between verbal and nominal status’. The difference then between verbs and their corresponding nominals, on this view, will show up in the phonological information. More or less in an idiosyncratic manner, the entries will specify *refuse* as the spelling for the item when it surfaces as a verb, and *refusal* as the spelling when it surfaces as a noun.⁵ Crucially, while the gerund *refusing* necessarily makes reference to a pre-existing verb *refuse*, the noun *refusal* and the verb *refuse* are both derived from a category-neutral item (see Picallo 1991; Pesetsky 1995; Marantz 1997; Harley and Noyer 1999; Alexiadou 2001; Embick Forthcoming; for more recent implementations of this idea, cf. Alexiadou 2009; Harley 2009; Borer 2003, Forthcoming).

According to Chomsky, derived nominals and the related verbs share the same lexical structure. This means, among other things, that inheritance involves (sub)categorical information. Thus, they can both assign theta roles in the same way.

However, most linguists interpreted Chomsky's claim as suggesting that derived nominals are built in the Lexicon, while gerunds are built in the syntax. On this understanding of *Remarks*, the *Lexicon* is seen as a system for assembling primitives into complex objects, in a way that is different from the way syntax does this. What does that mean for the analysis of derived nominals? Assuming, following Lieber (1981), but see Jackendoff (1975) and Aronoff (1976), that the lexicon contains morphemes that are specified for lexical category, affixation of *-al* to a verbal base *refuse* forms the noun *refusal* in the lexicon. The regularity of argument licensing is explained by assuming that the formal realization of arguments is determined by their thematic roles with respect to the head. In other words, it is not the syntactic structure which is directly inherited from the verb by the nominal, but simply the thematic grid, see Giorgi and Longobardi (1991), and Amritavalli (1980), Hoekstra (1986), Rappaport (1983), or Rozwadowska (1988) for various implementations of this idea.

On the contrary, for a number of researchers, the verb-like properties of derived nouns similar to those of gerunds result from the presence of verbal syntactic structure, at least a VP, see for example, Lebaux 1986; Picallo 1991; van Hout and Roeper 1998; Fu et al. 2001; Borer 1993, 2003, forthcoming; Borsley and Kornfilt 2000; Alexiadou 2001, 2009). This view suggests that only nouns which are related to corresponding verbs have AS. On this view, both derived nominals and gerunds contain a DP,⁶ where they might differ is the type and amount of verbal structure they include.

The most convincing arguments in favor of the view that a VP is present inside nominalizations would be examples where crucial properties standardly associated with VPs appear with nominals. Two obvious cases are adverbial modification and assignment of accusative case. For gerunds, the presence of a VP is not controversial (see Abney 1987 and much subsequent work): they allow adverbial modification as well as the assignment of accusative case. But the problem arises with derived nominals, which lack both of these properties [see (5) above]. Thus, the behavior of English-derived nominals alone will not be sufficient to settle this issue, although Borer (1993) argued that these are passive nominals and Alexiadou (2001) analyzed them as ergative structures. However, other languages such as Hebrew permit adverbs as well as license accusative case in derived nominals [(6), Borer 1993, 2003; Hazout 1995 for Hebrew, but cf. Siloni 1997 for a different analysis of the Hebrew paradigm]:⁷

- (6) Harisat ha-cava et ha-kfar be-axzariyut
 destruction the army ACC the-village with cruelty
 'The army's destroying the village cruelly'

Under the standard assumption that adverbs modify VPs and not NPs (see Jackendoff 1977) and that nominals have a structure similar to that of other DPs, the presence of adverbs in derived nominals is unexpected. It can straightforwardly be accounted for, however, if we assume that a VP is present within such nominals.

In section 5, we will see that current discussion on the syntax of nominalizations is concerned with the division of labor between nominal and verbal functional layers. If nominalizations constitute a mixed category, this is reflected in their structure: while all nominalizations are DPs, they differ in the amount of verbal structure contained within nominal structure, again of variable size. The task is to develop criteria to specify the relevant layers (Borsley and Kornfilt 2000; Alexiadou 2001; Borer 2003, forthcoming; van Hout and Roeper 1998 among others).

4. The Event Structure Perspective

Grimshaw (1990) seminal work introduced a new focus in the research on nominalization. Grimshaw pointed out that derived nominals do not form a homogenous class. In fact, they can be divided into three main classes, which she called ‘complex event nominals’, ‘simple event nominals’, and ‘result nominals’. Only the former obligatorily license AS, while the other two lack AS. For this reason, here I follow Borer (2003) and I take the relevant distinction to be between AS nominals and R(eferential) nominals:

- (7) 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
- (8) R-nominals
 - a. the instructor’s examination/exam
 - b. John’s collections
 - c. these frequent destructions

The two classes are systematically distinguished in the following way (from Borer 2003: 45):

(9) Table 1

AS-Nominals	R-Nominals
theta-assigners,	non-theta-assigners,
obligatory arguments	no obligatory arguments
event reading	no event reading
agent-oriented modifiers	no agent-oriented modifiers
subjects are arguments	subjects are adjuncts
<i>by</i> phrases are arguments	<i>by</i> phrases are non-arguments
implicit argument control	no implicit argument control
Aspectual modifiers	no aspectual modifiers
<i>frequent, constant</i> , etc. possible	<i>frequent, constant</i> , etc. possible
without plural	only with plural nouns
mass nouns	count nouns

For Grimshaw, the verbal properties of AS nouns result from the event structure and AS of the DPs that they head. By ‘event structure’, Grimshaw means a representation of the elements and structure of a linguistic event, not a representation of the world. For example, a verb is associated with an event structure. The event structure decomposes verbs into aspectual sub-parts. An accomplishment verb (see the discussion in the next section) like *x constructs y* is analyzed as an activity in which *x* engages in construction plus a resulting state in which existence is predicated of *y* (Grimshaw 1990: 26). This can be represented as in (10):



Argument structure includes an aspectual dimension in that argument relations are jointly determined by the thematic properties of the predicate (i.e. the thematic hierar-

chy) and by the aspectual properties of the predicate, its event structure. The argument that participates in the first sub-event ('activity') is more prominent than the argument which participates in the second sub-event ('result'). Grimshaw hypothesizes that a predicate lacking an event structure will also lack an AS and will never take any grammatical arguments at all.

Grimshaw thus proposes that the real distinction in the nominal domain is that between nouns that have an associated event structure and nouns that lack an event structure. AS nominals are amenable to an event structure analysis and hence are capable of licensing arguments, similar to verbs. A complex event/AS nominal, by definition, denotes an event with an internal aspectual structure. For example, the noun *replacement* has the (obviously simplified) representations in (11) for its two readings, from Alexiadou and Grimshaw (2008:5):

- (11) a. *replacement*: the individual 'z' in <x replaces y with z> No aspect
 b. *replacement*: the event <x replaces y with z> Aspect – telic

In (11a), the noun corresponds to an argument of the verb, and in (11b), it corresponds to the event encoded by the verb: the noun is telic, like the base verb. According to this hypothesis, all derived nouns are represented with the same syntactic structure. They are simply extended projections of NPs, their difference lying in AS—which in turn is critically related to event structure in the way sketched in Grimshaw (1990), Siloni (1997) among others: there is a representation of the event structure of a noun (or verb), which is linked to an AS.

Grimshaw's work predicts that only those nominalizations that contain a complex event structure will license arguments. That this cannot be correct has been argued most prominently by Borer (2003) on the basis of de-adjectival nominalizations. See also Markantonatou (1992), Kolliakou (1995), who discuss Greek AS nominalizations that derive from verbs lacking a complex event structure, e.g. stative verbs (see section 5.1).

Another issue of controversy concerns the general question of whether the event and subsequently AS of a predicate (verb or noun) is determined by the semantics of a lexical entry or if it is determined by the syntactic structure (see the discussion in the next section, and Borer 1993, 2003, forthcoming; Travis Forthcoming; Ramchand 2008).

For the area of nominalization in particular, Grimshaw's work has raised the question of how to capture the differences between AS and R nominals, and not between gerunds and derived nominals, although gerunds are unquestionably AS nominals. While gerunds are necessarily AS nominals, derived nominals are systematically ambiguous. (11) shows how this is performed in a 'lexical' approach. In syntactic approaches (Picallo 1991; Alexiadou 2001; Borer 2003, forthcoming), the difference between AS nominals and R nominals relates to the number of functional layers that are contained within these nominals. Unlike AS nominals, R nominals do not contain layers that partake of AS licensing.

5. Event Classes and Aspect

Zooming in now on details of aspect and event classification, we will see that across languages, nominalization patterns have a systematic distribution related to aspect. We find two instantiations of this phenomenon. In one case, nominalizations are sensitive to a particular aspectual verbal base. In a second case, certain nominalization patterns trigger aspectual shifts, similar to what we know from the verbal domain (e.g. progressive).

Some clarification is in order regarding the terms *aspect* and *event*. They have been used in various ways in the literature, and it is often difficult to understand what is meant in a

given use of each term. For current purposes, the crucial distinction is between inner and outer aspect, as put forth in Verkuyl (1993). These two are seen as contributing different aspectual information, see Borik (2002) and others. The former conforms to what Smith (1991) labels situation aspect/*Aktionsart*; the latter to what Smith calls viewpoint aspect. Outer aspect focuses on a temporal perspective of the event and includes the progressive and (im)perfective. To keep these two notions distinct, I will use the term ‘outer aspect’ for viewpoint aspect/sentential aspect and ‘inner aspect’ for what others refer to as event structure/situation aspect/lexical aspect/*Aktionsart*.⁸

5.1. INNER ASPECT CLASSIFICATION

Vendler (1967) proposed a four-way classification of verbs. According to Vendler, all verbs can be classified as denoting states, activities, achievements, or accomplishments. These can be defined and exemplified as follows:

- (12) a. activities: events that go on for a time, but do not necessarily terminate at any given point.
 - b. accomplishments: events that proceed toward a logically necessary terminus.
 - c. achievements: events that occur at a single moment, and therefore lack continuous tenses (e.g., the progressive).
 - d. states: non-actions that hold for some period of time but lack continuous tenses.
- (13) *Activities*: Mary danced for an hour.
- (14) *Accomplishment*: Mary built three houses in a year.
- (15) *Achievements*: The window broke.
- (16) *States*: Mary knows the answer.

Smith (1991) added a fifth class called *semelfactives* (instantaneous events). This class includes verbs such as *knock* and *cough*. According to Smith, achievements are instantaneous culminating events, while semelfactives are instantaneous non-culminating events.

While early work on event classification took the object of classification to be the verb, it was later noted that characteristics of the object, adjuncts, and other materials in the clause contribute to the event type of the entire clause. Hence, a number of authors, e.g. Verkuyl (1972), Dowty (1979, 1991), Tenny (1987, 1994), and Ritter and Rosen (1996), have all argued that classification must be compositional, not exclusively verb-based.⁹

Following much recent work (Ramchand 2008; Borer 2005; Harley 2005 and others), I will take the domain of the (decomposed) VP to correspond to the domain of inner aspect, and AspectP to be the locus of outer aspect information, as in (17), see Belletti (1990), Cinque (1999), Abraham (1996). AspectP hosts features that encode $\pm$ perfective, $\pm$ generic, $\pm$ progressive:

- (17) [AspectP [VP]]

In the next section, we will see that certain inner as well as outer aspectual restrictions apply across languages, which seem to correlate with the distribution of specific nominalization affixes/patterns, see also Brinton (1995), Snyder (1998).

This picture suggests that *-m-* and *-s-* affixation gives grammatical results only under certain conditions: (i) *-m-* combines only with those verbal bases that can receive a continuous interpretation. Hence, *destruction* as well as *assassination* is out with *-m-*, as they cannot be interpreted as activities, and (ii) *-s-* combines only with those verbal bases that lack a continuous interpretation and is telic.

The state of affairs presented above is very reminiscent of what Borer (2005) notes for the English nominalizer *-ing* that appears in mixed nominals. Specifically, Borer (2005: 239ff.) notes that the affix used for the formation of mixed nominals (*-ing* of), nominalizer *-ing*, as she calls it, is sensitive to the Aktionsart of the VP involved; it is OK with non-culminating events [activities and semelfactives in (22)].

- (22) a. the sinking of the ships
b. the falling of the stock prices
c. the jumping of the cows

According to Borer, nominalizer *-ing* is out with achievements, causing an anti-telicity effect:

- (23) a. *the arriving of the train
b. *the erupting of Vesuvius
c. *the exploding of the balloon

This is not the case for gerund formation and other derived nominals, which are compatible with all types of inner Aspect.

- (24) a. the arrival of the train *derived nominals*
b. The train arriving at 5 pm is unlikely. *verbal gerund*

Similar observations have been made for Spanish (Fabregas and Varela 2006; and Fabregas Forthcoming), Italian (Melloni 2007), French (Meinschaefer 2005), German *-ung* nominalizations (Roßdeutscher Forthcoming), and Romanian (Iordachioaia and Soare 2008). I demonstrate the Spanish, Romanian, and Italian patterns below.

Spanish has two types of nominalized infinitives: verbal and nominal ones. Miguel (1996) takes the distribution of the nominative vs. PP subject as the main distinction between the two types of infinitives in Spanish. This is illustrated in (25a&c). Note that the verbal infinitive can also assign accusative Case (25b):

- (25) a. el murmurar la gente
the murmur.INF the people.NOM
'the murmuring of the people'
b. [el cantar yo la Traviata] traera malas consecuencias
the sing.INF I.NOM the Traviata.ACC bring-about bad consequences
c. el murmurar **de** las fuentes
the murmur.INF of the fountains
'the murmuring of the fountains'

The nominal infinitive shows an inner aspect sensitivity: it is fine with activities, but out with achievements (26b) and accomplishments (26c), as well as state verbs (26d):

- (26) a. El trabajar de Juan en el campo
the work-INF of John in the garden
b. *El intenso llegar de Pedro a la habitación (fue presenciado).
Lit. The intense arrive.INF of Pedro to the room (was watched).
c. *El rápido construir la casa de los albañiles (fue presenciado).
Lit. The fast build.INF the house by the workers (was watched).
d. *El saber inglés de Paula (fue presenciado).
Lit. The know.INF English of Paula (was watched).

Achievements and accomplishments become acceptable in the iterative reading:

- (27) el constante llegar tarde de Juan durante seis años
the constant arriving late of John for six years

In Romanian, there are two productive nominalization strategies: the infinitive and the supine. The former is not compatible with atelic bases like the activities in (28) (Cornilescu 2001).

- (28) *muncirea / *alergarea lui Ion
work.INF-the / run.INF-the of John.GEN

Italian has a number of nominalizing affixes, some of which are inner Aspect sensitive, as shown by Melloni (2007). In particular, the affix *-io* is compatible only with semelfactive verbs, and *-enza* is compatible only with state verbs (29):

- (29) a. gocciolare ‘to drop’ → gocciolio ‘sequence of drops’
b. conoscere ‘to know’ → conoscenza ‘knowledge’

5.3. OUTER ASPECT SENSITIVITY

In this section, I will summarize the evidence that across languages certain nominalizations introduce aspect shift, i.e. they alter the inner aspect of the base regardless of its kind. This behavior is similar to that of the outer aspect contributed, for instance, by the progressive in ‘The train is arriving’. These nominalizations are the ones that generally tend to be more verbal across languages.

While Greek seems to lack such a nominalization pattern, the English gerund is a good candidate for this class, as it is possible with most verbs (30) (Borer 2005) and contributes imperfective outer aspect even on telic predicates (30a), as argued by Pustejovsky (1995) and Siegel (1997).

- (30) a. John’s arriving at 5 pm is unlikely.
b. John’s eating breakfast
c. Mary’s blinking is annoying
d. John’s knowing the answer

A somewhat more interesting illustration of outer aspect sensitivity is offered by the second type of nominalization in Spanish, the *verbal infinitives*. These are clearly not sensitive to the inner aspect of the root [(26) vs. (31)]. While these lack a special aspectual contribution, they can appear in the perfective with the auxiliary *haber*, so they exhibit aspect shift:

- (31) [El *haber* él escrito novelas] explica su fama
 the have.INF he written novels explains his fame

Perhaps the clearest candidate for this pattern is the *Romanian supine* that can be formed from most verbs and shifts their inner aspect, as discussed by Iordachioaia and Soare (2008): achievements (32a), accomplishments (32b), and punctual events (32c), all telic, get a habitual reading in the supine:

- (32) a. *sositul* lui Ion cu întârziere
 arrive.SUP-the John.GEN with delay
 'John's (habit of) arriving late'
 b. *mîncatul* micului dejun pe terasă
 eat.SUP-the breakfast.GEN on terrace
 '(the habit of) having breakfast on the terrace'
 c. *Clipitul* Mariei în acest moment e enervant
 blink.SUP-the Mary.GEN in this moment is irritating
 'Mary's blinking in this moment is irritating.'

Iordachioaia and Soare (2008) note that the supine, but not the infinitive, triggers an aspectual shift that can be witnessed by the compatibility of atelic *for*-PPs with inherently telic verbs (33a vs. 33b):

- (33) a. *sositul* lui Ion cu întârziere *timp de 3 ani*
 arrive.SUP-the John.GEN with delay for 3 years
 b. *#sosirea* lui Ion cu întârziere *timp de 3 ani*
 arrive.INF-the John.GEN with delay for 3 years

Finally, Melloni (2007) points out that the Italian nominalizing affix *-ata* is sensitive to outer aspect. According to Melloni, this affix is a packaging operator that modifies the Aktionsart of the base verb: irrespectively of the input of the base, it produces a bounded event. (34) is the mirror image of the Romanian example above, see Ippolito (1999):

- (34) a. *Gli ho dato una coltellata per trenta secondi
 to him I gave a stab for thirty seconds
 b. Gli ho dato una coltellata dentro trenta secondi
 to him I gave a stab in thirty seconds

6. Conclusion

In this paper, I have attempted to show how generative grammar has been dealing with nominalizations for the last 40 years. Naturally, this article cannot do full justice to the rich work that has been devoted to this topic. It has only reviewed some important stages of the development of the theory, highlighted some new directions, and raised some (new) questions.

In the next part, I will turn to a detailed discussion of different views on aspect sensitivity. The contrasts observed here are at first sight puzzling in the sense that they point out that nominal affixes have both a semantic and syntactic function, which await formalization.

Short Biography

Artemis Alexiadou's research interests lie in theoretical and comparative syntax with special focus on the interfaces between syntax and morphology and syntax the lexicon. Her books include *Adverb Placement* (Benjamins 1997), *Functional structure in nominals* (Benjamins 2001), *Noun phrase in the generative perspective* (co-authored with Liliane Haegeman and Melita Stavrou, Mouton de Gruyter 2007). She is currently Professor of Theoretical and English Linguistics at the University of Stuttgart. Before coming to Stuttgart, she has held research positions in Berlin and Potsdam, taught at the University of Tübingen, and has been a Heisenberg Fellow at MIT, Princeton and University of Pennsylvania. She holds a BA from the University of Athens, an MA from the University of Reading, and a Ph.D. from the University of Potsdam.

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Notes

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¹ Fraser (1970) argues that these two *-ing* forms clearly receive a different semantic interpretation: the gerund is interpreted as an assertion of a fact, while the mixed nominalization is interpreted as an event. Derived nominals can almost always replace mixed nominalizations but not gerunds. I will have nothing to say about the different gerund forms here, see Pires (2006) for some recent discussion. See also Zucchi (1993).

² A note on the historical development of the two *-ing* types is in order. While the nominalizer *-ing*, found in mixed nominals, goes back to an Old English affix *-ung*, it is not clear where the gerund *-ing* derives from. A plausible hypothesis advanced in Visser (1973) and Houston (1985) is that the gerund developed out of a syncretism between the verbal participle and the nominalization and that the progressive is the pattern responsible for this. The modern English progressive derives from a structure of the following form: *I am on hunting*, i.e. the progressive is actually derived from a nominal construction embedded in a locative PP (see also Bolinger 1971). The present participle + auxiliary *be* was not originally used to express progressive semantics. In Old English, the participle was formally different from the nominal, being formed with the affix *-ende*. Because of a number of morpho-phonological changes, however, both the nominal and the participle became formally identical, ending in *-ing*. In fact the rise of verbal traits associated with verbal gerunds correlates with the rise in the use of the progressive throughout the Modern English period.

Further evidence for the hypothesis that the syncretism between the nominal and the participle in the progressive led to the emergence of the verbal gerund comes from the observation that one finds strings such as 'the reading the book', the so-called *intermediate type*. Such forms co-occur with mixed nominals and verbal gerunds from Early Modern English and until the 20th century, cf. (i).

(i) You need not fear the having any of these lords (Shakesp. Merch I, ii, 109, 1596)

Houston (1985: 185) notes that the intermediate type as it is most frequent during the period when verbal and nominal gerunds were almost equally frequent, namely in the 17th century. In the 19th century, there are occurrences of the intermediate type after a period in which no such figures are available. There could have been no other way for the intermediate form to emerge (see also Tajima 1985).

³ There are several issues that will not be discussed here. First, I will not be concerned with the question of zero affixation, see Borer (2003), Newmeyer (2008), Alexiadou and Grimshaw (2008) for some thoughts on that. Second, I will not discuss how derived nominals differ from mixed nominals, see Harley and Noyer (1999), Alexiadou

(2001), Borer (Forthcoming), Alexiadou et al. (2009), Sichel (Forthcoming). Third, I will not focus on the AS vs. referential nominal debate and how this is explained in the different systems. The reader is referred to the sources given here. I will also have nothing to say about *-er* nominals in any detail, see Rappaport Hovav and Levin (1992), Alexiadou and Schäfer (2008), Schäfer (2008), Baker and Vinokurova (Forthcoming) for an overview of this discussion and references.

⁴ As an anonymous reviewer pointed out, clearly once one looks at languages other than English, the rich patterns of nominalizations one finds get more complex than that. See Borsley and Kornfilt (2000), Alexiadou et al. (to appear), and Alexiadou et al. (to appearb) for some discussion of various sub-types of nominalizations with mixed nominal and verbal properties.

⁵ This has to be considered in the light of the organization of grammar proposed in Chomsky (1965) and in *Remarks*. The reader is referred to the two original works by Chomsky and to Carstairs-McCarthy (1987) presentation of early generative research in this area.

⁶ I assume here, following Longobardi (1994), that a nominal expression is an argument only if it is introduced via a DP layer.

⁷ The example actually contains a PP, not a bare adverb. For this reason, Siloni (1997) argues that there is no syntactic argument for the presence of a VP, while Borer (1993) argues that bare adverbs require higher levels of structure in order to be licensed.

⁸ Authors distinguish between (i) *lexical aspect* (Aktionsart), which focuses on the lexical type of verbs determined by their inherent temporal properties (cf. Rothstein 2001); (ii) *predicational* or *telicity* aspect (Verkuyl 1972, 1993; Dowty 1979), which refers to the aspectual type of the predicate and can be either telic or atelic; and (iii) *grammatical* or *viewpoint aspect* (Comrie 1976; Smith 1991). There is a certain amount of confusion in the literature, e.g. Verkuyl (1993) uses the term *terminative* as a synonym to *telic* and *durative* as a synonym to *atelic*; Tenny (1994), Levin and Rappaport Hovav (1995) and Brinton (1988) use the term *delimited* and *non-delimited* to distinguish between telic and atelic, while Krifka (1989) and Krifka (subsequent work) and Borer (2005) use *quantized* and *non-quantized*, respectively.

⁹ It has also been pointed out that the classes themselves are not primitive. Instead, classification is based on certain feature combinations, which can be used to generate the four Vendler classes. For authors such as Verkuyl (1993), the relevant features are *continuousness*, or whether the event has duration, and *boundedness*, or whether the event has a (natural) terminal endpoint. Activities and accomplishments take place over a period of time; states and achievements do not. Accomplishments and achievements have a terminal bound; states and activities do not.

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