Noun–verb conversion without a generative lexicon

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Abstract

This paper discusses different types of zero-derived de-verbal nominals with a focus on result nominals, simple event nominals and complex event nominals. I argue that zero-derived nominals should be treated on a par with overtly derived nominals. I claim that verbs that have related zero-derived nominals have nominal gender features in their lexical entries in addition to verbal features, like Proc and Res, and that merging a gender feature on top of an event-structure representation results in a nominal. To capture the fact that verbal entries can be inserted in both nominal and verbal contexts, I apply the principle of underattachment, or underassociation, that allows lexical entries to be inserted in the syntax even when not all of the features in the lexical entry are present in the syntax (see e.g. Ramchand 2008 and Caha 2009). In verbal contexts, no gender feature is inserted, and in some of the nominal contexts, only a subset of the verbs event features are present. I further argue that the only function of overt nominalizing suffixes is to lexicalize a gender feature. If the lexical entry of a verb already contains a gender feature, no overt nominalizing suffix needs to be inserted.

1. Introduction

In many languages, including Swedish, there exist homophonous verb-noun pairs that seem to be related to the same underlying concept, as exemplified below for Swedish:

(1) a. *pussa*$_{\text{verb}}$ - *en puss*$_{\text{noun}}$ ('kiss')
b. *cykla*$_{\text{verb}}$ - *en cykel*$_{\text{noun}}$ ('bike')
c. *kvittra*$_{\text{verb}}$ - *(ett) kvitter*$_{\text{noun}}$ ('chirp')
d. *stapla*$_{\text{verb}}$ - *stapla*$_{\text{noun}}$ ('pile')
e. *misshandla*$_{\text{verb}}$ - *misshandel*$_{\text{noun}}$ ('manhandle/assault')

The nouns above seem to be related to the verbs in different ways, e.g., in (1b) the noun refers to the instrument used in the action, in (1d) the noun refers to the result of the event, and in (1e) the noun refers to the event itself. In this paper, I will focus on the event-denoting and the result-denoting nominals. I will focus on the following questions:

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1. What are the possible semantic relations between the verb and the corresponding noun, and to what extent is the interpretation of the noun predictable given the meaning and syntactic behavior of the verb?

2. To what extent is noun-verb conversion a productive process in Swedish?

3. What is the division of labour between the lexicon and the syntax, i.e., could verb-noun-conversion be captured as (i) a lexical process, (ii) a syntactic process, or (iii) should we treat sense-related, homophonous verbs and nouns as independent lexical entries with no formal relation between them.

The last question above needs some further elaboration. To be able to answer it, a fairly detailed definition of the "lexicon" and "syntax" is required. In section 3, I will briefly describe four frameworks that have treated either category-changing operations or argument structure-changing operations (passivization, anti-causativization) in slightly different ways, and with the help of that discussion, question number three above can hopefully be given a meaningful answer. Otherwise, I will try to argue for the following answers to the questions above:

1. The semantic relation between the verb and corresponding noun is in most cases transparent and predictable, taking the argument and event structure of the verb as the starting point.

2. Noun-verb conversion is a somewhat productive process in Swedish, though there is always some process of "coining" involved, or more specifically - morphosyntactic and/or semantic features must be added to an already existing root: either information about gender class is added to verbal root, or event- and argument structure information is added to a nominal root. In other words, lexical items that can surface either as nouns or verbs, need to carry explicit marking about this in the lexicon(see details in 3.4).

3. One and the same lexical entry can be targeted in both nominal and verbal contexts. Lexical entries contain a set of features of which only a subset need to enter the syntax. (see 3.4).

In the next section I will give some basic background on verbs and nouns, and most importantly, deverbal nouns (i.e. nominalizations). In section 3, I quickly review a couple of attempts to capture category changing and valency changing operations (all within the generative framework), including the very framework followed here. In section 4, I discuss different groups of zero-derived de-verbal nouns, and how to derive the differences between them. Section 5 summarizes the paper.

2. Verb, noun or in between

It is more or less impossible to discuss verb-noun conversion without touching on the broader topic of (de-verbal) nominalizations. Verbs and nouns differ from each other in a number of ways. For example, cross-linguistically verbs tend to carry tense marking, person and number agreement and they can assign accusative/structural case to their complements. Further, verbs often select for a specified number of arguments, that usually have to surface in the syntax. Nouns on the other hand tend to co-occur with determiners, and they tend to carry number and gender marking that reflects the number and gender of the noun itself. They further do not assign accusative case to complements. Semantically, verbs tend to denote events, while nouns tend to denote objects. Nominalizations, or (de-)verbal nouns can inherit some of the verbal traits, and they can also show a number of the typical nominal traits. I will briefly exemplify this using English. In (2) a transitive finite verb is given, with tense marking and person agreement, and two arguments carrying structural case.

(2) He paints pictures featuring the recent disturbances in Los Angeles.

In (3), three different types of nominalization of the same verb (*paint*) are given, all derived with the suffix -*ing* (see .e.g. Lees 1964, Chomsky 1970, Ross 1973 and Abney 1987 for discussion of different types of *ing*-nominals). The three examples show a declining amount of verbal properties:

(3) a. [John's painting a picture featuring the recent disturbances in Los Angeles] caused a huge riot among the art people.
b. A classic example is [John L's painting of a picture featuring the recent disturbances in Los Angeles].
c. [A painting (*of a picture featuring the recent disturbances in Los Angeles) by John L] hung on the wall

The so-called POSS-*ing* in (3a) shows many of the typical verbal properties: it assigns accusative case to its internal argument, and it denotes an event, just like its full verbal counterpart in (2). It however doesn't carry tense marking and person agreement. Further, the subject is marked as a possessor, and the whole nominalized phrase occupies a typical DP/NP position (subject position). In (3b), a so-called *ing of*-nominalization (or 'mixed' nominalization) is given. It retains the eventive properties of the full verb and the POSS-*ing*, but it cannot assign accusative case to its internal argument, which instead surfaces with the preposition *of* (Genitive Case). In (3c) a result nominalization is given, that doesn't refer to an event at all. In this context the internal argument cannot surface.

The nominalizations in (3) are all derived with the help of a suffix. When it comes to zero-derived nouns, the verbal traits they can carry are fewer. First, there are no zero-derived nouns that can assign accusative

case, like the the Poss-*ing* in (3a). It has however been noticed that they can denote events, just like the *ing-of*-nominal in (3b), as exemplified below (from Harley 2009).

(4) a. the frequent defeat of the Korean forces
b. the frequent outbreak of disease in refugee camps
c. the frequent murder of journalists

In Swedish, accusative assigning nominalizations, like the English POSS-ing in (3a), are absent. We do have event denoting nominals though, which can be formed by one of the two productively used suffixes *-e/a-nde* or *-(n)ing*. Zero-derived de-verbal nouns can also be event denoting, and there are further a couple of non-productively used suffixes that give rise to event denoting nominals (i.e. *-tion* and *-an*). Nominals formed with *-e/a-nde* only very rarely denote results or objects (see Lundquist 2008 for discussion), while *(n)ing*-nominals and zero-derived nominals can denote both events and objects. As was shown in (1), zero-derived nominals can in fact denote many different types of objects (i.e. results and instruments), and as is shown in the list below, *(n)ing*-nominals also show a great variability in meaning (the groups are taken from Loman 1964):

1. Nomina acti: Refers to the result or product of an event:
   - *öppning* -'opening', *anteckning* -'note', *samling* -'collection', *bosättning* -'settlement', *stickning* -'knittings', *uppfinning* -'invention', *packning* -'luggage', *korrigering* -'correction', *markering*- 'marking'.
2. Nomina agentis: Refers to the agent of the action (though only from habitual events):
   - *regering* -'government', *ledning* -'management'
3. Nomina instrumenti: refers to the instrument or the means of the action:
   - *betalning* - 'payment', *kompensering* -'compensation', *fyllning* - 'filling', *stoppning* -'stuffing'
4. Nomina loci (denotes the place for the event):
   - *parkering* -'parking lot', *mottagning* -'reception'
5. Nomina temporis (denotes the time of the event):
   - *gryning* -'dawn', *skymning*-'dusk'

It seems like *(n)ing*-nominalizations and zero derived nominals have the same range in meaning.[1] Below I give a list of types of verbs and their nominalizations, that show that *(n)ing*-nominals and zero-derived nominalizations are in complementary distribution. Two verbs from each type of verb class have been chosen, where one of the verbs has a *(n)ing*-derived nominal, and the other one has a zero-derived nominal:

- Sound emission:[2]

(5) a. Jag hörde ett rop/ ??en ropning
I heard a shout/ ??a shout.NOM
'I heard a shout'
b. Jag hörde en viskning/ ??ett visk
I heard a whisper.NOM/ *??a whisper*
'I heard a whisper'

- Activity verbs:

(6) a. Under dansen/??dansningen började jag bli
during dance.DEF/*??dance*.NOM.DEF *started I get*
trött.
tired
'During the dance I started to get tired'
b. Under vandringen/*vandren började jag bli trött.
during hike.NOM.DEF/*hike*.DEF *startet I get tired*
'During the hike I started to get tired'

- Result nominals:

(7) a. Det står en hög stapel/ #stapling med gamla lådor
it stand a tall pile/ #pile.NOM *with old boxes*
på golvet.
on floor.DEF
'There's a tall pile of old boxes on the floor'
b. Han har en stor samling/ *sam(m)el med gamla
he has a big collect.NOM/ **collect with old*
serietidnignar.
cartoons
'He has a big collection of old cartoons'

[1] This paper will say nothing about the place (*loci*), time *temporis* and agent *agentis* nominals listed above, though it should be noted that there exist zero-derived nominals expressing these relations as well: $sponsra_{verb}$ - $sponsor_{noun,Agent}$ ('sponsor'), $lagra_{Verb}$ - $lager_{Noun,Place}$ ('store - storage'), $festa_{verb}$ - $fest_{noun,temp?}$.

[2] The glosses that will be used below are the following: NOM – nominalizing suffix, DEF – definite, CG – common gender and NEUT – neuter, PAST – past, PART – participle, SG – singular, PL – plural, POSS – possessive, AUX – auxiliary.

- Achievement verbs/event denoting nominals:

(8) a. Vid köp/ *köpning av hus är det viktigt att tänka
*at buy/ *buy.*NOM *of house is it important to think*
på ...
on...
'When buying a house, it is important to think about...'

b. Vid säljning/ *sälj av hus är det viktigt att tänka
*at sell.*NOM*/ *sell of house is it important to think*
på...
on...
'When selling a house it is important to think about...'

The examples above give a slightly skewed picture of reality though. A more thorough investigation shows many verbs have both related zero-derived nominals and *(n)ing*-nominals, as shown below:

(9) a. Det står en hög stapel/# stapling med gamla lådor på
*it stand a high pile/# pile.*NOM *with old boxes on*
golvet.
*floor.*DEF
'There is a high pile of old boxes on the floor.'

b. Efter staplingen av tunga lådor var vi ganska trötta.
*after pile.*NOM.DEF *of heavy boxes were we rather tired.*PLUR
'After the piling of old boxes we were rather tired.'

(10) a. Han använde paddeln för att ta sig fram genom
*he used paddle.*DEF *for to take* REFL *front through*
kanalerna.
*channel.*PLUR.DEF
'He used the paddle to move through the channels. '

b. Efter paddlingen var vi ganska trötta.
*after paddle.*NOM.DEF *were we rather tired.*PLUR
'After the paddling we were rather tired.'

In the examples above, the *(n)ing*-derived nominal denotes an event, while the zero-derived nominal denotes a result (9a) or an instrument (10a). There is no verb in Swedish (that I am aware of) that has an event denoting zero-derived nominal, and a instrument/result/place-denoting *(n)ing*-nominal. There are however both event denoting zero-derived nominals, and instrument/result/place-denoting *(n)ing*-nominals. However, when a verb has both a zero-derived nominal form, and a *(n)ing*-nominal, the *(n)ing*-nominal will always lie closer to the full verbal form in meaning (and syntactic behavior) than the zero-derived nominals (in short, the *(n)ing*-nominal carries more event entailments than the zero-derived nominal). It seems like *(n)ing*-nominals can carry all type of relations to the

verb that Loman (1964) mentioned (see above), but for many verbs, the *(n)ing*-nominal is blocked in one or many of its potential functions by a zero-derived nominal. Given the fact that *(n)ing*-nominalizations and zero-derived nominals can have the same relations to a verb, it is clear that zero-derived nominals should be treated as a form of nominalization.[3]

My main claim is that for verbal lexical entries, it has to be listed if the item can surface as a nominal without overt marking. The suffix *(n)ing* can be inserted if no such listed information is present. The most economical way for marking that a verb can surface as a noun, is to add gender or noun class information to the lexical entry (in addition to conjugation class features, and event and argument structure features). I will here hypothesize that interpretable gender or noun class features on the stem is a prerequisite for a lexical item to surface in a nominal environment. I will further assume that nominalizing morphology does nothing but provide gender features to a lexical item that lacks gender features.

The general structure of a syntax and a lexicon where the type of effects shown above can be captured will be shown in section 3.4, but first I will go through a couple of theories that have tried to capture similar phenomena.

3. Attempt to capture instability

The topic of this paper is in many ways a subtopic of the bigger topic that can be labeled "verbal polysemy", or "instability in valency". More familiar issues within this topic are for example causative-inchoative alternations (11) and double object/dative alternations (12), as exemplified below:

(11) a. He sank the boat (causative)
b. The boat sank (inchoative)

(12) a. He gave John a book
b. He gave a book to John

The alternations above differ from noun-verb-conversion in that the category of the predicate doesn't change in the examples above. Mostly because of convention, many linguists want to treat category changing operations in a different way from valency changing operations (see e.g. Wasow 1977). As will be argued below, category changing operations need not be viewed as qualitatively different from valency changing operations. In the end, we are dealing with the same issue, i.e., how to capture the phenomenon whereby one and the same root can fit into many different (morpho)syntactic contexts. A more intuitive example that will show the point is the passive, as exemplified below:

[3]People might argue that in some cases, verbs are de-nominal, and in other cases nouns are de-verbal. This distinction might be possible to make on diachronic grounds, but synchronically the distinction is, I think, pointless.

(13) a. Johan misshandlade Tommy. (Active)
John assault.PAST *Tommy*
'John assaulted Tommy.'
b. Tommy blev misshandlad av Johan. (Passive)
Tommy AUX.PAST *assault*.PART.SG *of John*
'Tommy was assaulted by John.'

The category of passive participles has been the center of much debate during the last 50 years or so in generative grammar (and in other frameworks as well, of course). We know that in Swedish, passive participles have basically the same distribution as adjectives, and they show the same type of inflection as adjectives. From that we can simply conclude that passive participles are derived adjectives just like nominalizations are derived nouns. If my claim that zero-derived de-verbal nouns are just another form of nominalization is true, we should be able to use the same mechanism for explaining noun-verb conversion as we use for capturing passive-active alternations. In (13b) we use a copula plus a derived adjective to refer to the same event as is referred to in (13a) with a verb, and similarly, in (14) we use a noun to refer to that very same event (differences in interpretation between (14) and (13) presumably have their origin in absence or presence of Tense and Mood, and not in the predicate itself):

(14) Johans misshandel av Tommy
John.POSS *assault of Tommy*
'John's assault of Tommy'

As we have seen above, many nominalizations (overtly derived or zero-derived) don't refer to an event, but rather to, for example, the result of the verb. In other words, they seem to have a reduced argument or event structure. That is also the case of causative-inchoative-alternations, as shown above, and also the case of many passive participles, as shown in (15):

(15) Dörren är fortfarande stängd.
door.DEF *is still close*.PART.SG
'The door is still closed.'

(15) does not make reference to an event of closing the door, but only to a state where the door is closed (it is silent about whether the door closed itself or someone closed the door— the door might never have been open as far as we're concerned). Again, anyone who wants to capture the relation between a passive participle and an active verb with the help of a syntactic or lexical rule, should also be interested in capturing the relation between an active verb and a nominalization (overtly derived or zero-derived) with a syntactic or lexical rule.

Below I will go through a couple of theories that have tried to capture the instability in category and/or valency in a more or less systematic way.

In 3.4, I sketch the program I follow myself, which in many respects builds on ideas that originate within the other suggestions sketched below.

3.1. Pustejovsky (1995)

Pustejovsky's *Generative Lexicon* captures a lot of cases of polysemy in both the nominal and verbal domain, for example causative–inchoative alternations (in the verbal domain) and mass–count-alternations (in the nominal domain). Pustejovsky does not discuss noun–verb conversion in detail, and his general take on nominalization is rather opaque. Pustejovsky's system has two important features that I will keep in my analysis: (1) a rich lexicon, i.e. a lexicon where each entry carries a lot of information (i.e. "features") and (2) a mechanism which allows only a subset of the features in the lexical entry to surface in the syntax (via the operation Type Coercion or Selective Binding). I will not go into the details of his system here. My analysis will not involve a generative lexicon, though I think that it can capture most of the regular processes that Pustejovsky treats as lexical.

3.2. Hale and Keyser (2002)

Hale and Keyser (2002) devote a lot of energy trying to capture the relation between lexical categories and different classes of verbs. They take as a starting point the fact that many verbs in English and in other languages have a nominal or adjectival base, as shown below:

(16) a. John coughed. (de-nominal verb)
b. The door opened. (de-adjectival verb)

They argue that these verbs are created by merging something of the category N (as in *cough*) or A (as in *open*) with a verbalizing head, or, as they put it, by conflating a noun or an adjective with a V head. In other words, a verb can be an adjective or noun plus something, i.e., nouns and adjectives are structurally subsets of verbs. They further notice that intransitive de-adjectival verbs usually are unaccusative (the single argument is theme- or patient-like), while de-nominal verbs usually are unergative (the single argument is agent-like), as can be seen in the fact that de-adjectival verbs easily causativize, while de-nominal verbs do not:

(17) a. The door opened.
b. John opened the door.

(18) a. The baby coughed.
b. *He coughed the baby.

From this fact (among others) they conclude that adjectives require the presence of a specifier, whereas nouns do not. They state that adjectives are +predicate, whereas nouns are −predicate, and +predicate items require a specifier, which is not provided by the category A by itself, but by a verbal

head.[4] Also other types of verbs can be described as nouns or adjectives that conflate with different types of predicates (like DO, HAPPPEN and SPATIAL COINCIDENCE).

Though I will not be able to fully lay out the details in this paper, I will adopt Hale and Keyser's proposal that there is a strong connection between the argument–event structure of the verb, and the availability of related nouns and adjectives. There are however two problems with their approach, which become evident when looking at Swedish:

1. Not all nouns can conflate with a verbal head. In many cases, it seems rather unpredictable which nouns have corresponding verbs. Compare for example the nouns *anfall* ('attack') and *räd* ('raid'), which have similar properties as nouns, but only one of them can surface as a verb:

   (19) a. ett anfall/en räd mot staden
   *an attack/a raid towards city.*DEF
   'an attack on the city'
   b. Vi ska anfalla/*räda staden.
   *we will attack.*INF*/raid.*INF *city.*DEF
   'We will attack the city.'

   In Swedish in general, a lot of nouns do not have corresponding verbs (most of them, probably), while in English noun-verb-conversion seems to be more common, though it still doesn't extend to all nouns. The difference between the lexical items *anfall* and *räd* has to be stated somewhere, and I will claim below that it has to be stated in the lexical entries.

2. Verbs that seem to be based on typical nominal concepts do not necessarily have a corresponding zero-derived nominal. Examples of this were given above, where zero-derived and *(n)ing*-derived nominals were compared. Below I repeat the examples based on the verbs *dance* and *hike* — two verbs that in English have related zero-derived nouns. In Swedish only one of these verbs (*dansa*) has a zero derived nominal, while the other (*vandra*) does not, but has a nominal in *-ing*.

[4] The full lexical categories paradigm looks like this according to Hale and Keyser (1993):

(i) a. Noun: -complement, -predicate
b. Verb: +complement, -/((+)predicate
c. Adjectives: -complement, +predicate
d. Adpositions: +complement, +predicate

(20) a. Under dansen/??dansningen började jag bli
*during dance.*DEF*/??dance.*NOM.DEF *started I get*
trött.
tired
'During the dance I started to get tired.'

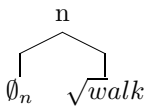
b. Under vandringen/*vandren började jag bli trött.
*during hike.*NOM.DEF*/hike.*DEF *started I get tired*
'During the hike I started to get tired.'

I will return to Hale and Keyser in section 4.1, and show that their analysis is to some extent correct, though it needs to be extended to cover some types overtly derived nominalizations as well, and also different types of participles (in addition to the adjectives).

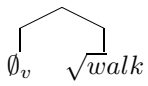
3.3. Distributed Morphology

One of the most popular branches within generative grammar of the last ten years is Distributed Morphology (henceforth DM) (see Halle and Marantz 1993 and Harley and Noyer 1999). An important point within DM has been to show that the syntax is the only generative component in human language. There is in other words no generative lexicon in DM, and both words and sentences are built up in the syntax with help of the same mechanisms (basically Merge). The DM'ers make a strict distinction between lexical material or "roots" and functional material. The roots are taken to all be category neutral, i.e. not specified for lexical category. Lexical category is assigned to the roots in the syntax with help of functional categories (like n(oun), v(erb) and a(djective)) as shown below:

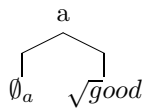
(21) a.



b.



c.



Even though DM easily captures the syntactic/categorical instability of lexical items, it vastly over-generates, and it has no way of capturing the fine-grained lexical patterns shown by e.g. Pustejovsky (1995), or the relations between category and argument structure pointed out by Hale and Keyser (1993).

3.4. Nanosyntax

The three suggestions above all have their merits and their flaws. The desired system would have the following qualities:

- A system with highly specified lexical entries, or more specifically, a lexicon where each entry carries a lot of features (as in Pustejovsky 1995).
- A syntax/lexicon interface that allows some of the features of the lexical items to not be realized in the syntax (i.e., some type of coercion/selective binding, in terms of Pustejovsky 1995).
- A system that captures the relation between verb type (i.e. Unergative vs. unaccusative) and underlying category (i.e. adjective/participle vs. noun/nominalization), as in Hale and Keyser (1993).
- A system where lexical category is not straightforwardly determined at the lexical level, as in Distributed Morphology.

In Lundquist (2008) I use a system that has all the properties listed above to deal with nominalizations and participles. The properties listed above all fit into Nanosyntax, as being developed by a number of researchers based at the University of Tromsø — see Starke (2009) for an overview, and Ramchand (2008), Caha (2009), Muriungi (2005) and Svenonius (2006) for work in this spirit.

In this paper, I will not have space to lay out the program in detail (and many details are still under discussion). I will instead just give a couple of points that are relevant to verbal syntax, semantics and morphology below:

1. Verbal entries carry information about event structure and argument structure (at least).
2. The verb phrase can be decomposed into two or more subevents, as in Pustejovsky (1995) or Ramchand (2008).

   (a) Pustejovsky: Process → Result

   (b) Ramchand: Initiation → Process → Result

   In this paper, I will only make use of two sub-events (i.e., the Pustejovsky system), but I will follow Ramchand (2008) in the general architecture of the syntax/semantics. To capture all the relations between verbs and their corresponding nominals, a more fine-grained decomposition of the verb phrase is needed.
3. Arguments receive their thematic interpretation by binding an index in the sub-eventual heads (as in Baker 2003, see Ramchand 2008 for a different account). A couple of examples of lexical entries are given below:

(22) a. *stänga*$_{\text{Transitive}}$ ('close'): Proc$_i$, Res$_j$
b. *samla*$_{\text{Transitive}}$ ('collect'): Proc$_i$, Res$_j$
c. *försvinna*$_{\text{Unacc}}$ ('disappear'): Proc$_i$, Res$_i$
d. *skratta*$_{\text{Unerg.}}$ ('laugh'): Proc$_i$

4. There are two principles for lexical insertion that will be of importance for capturing the conversion studied in this paper.

   - Late insertion: The syntax operates on abstract morpho-syntactic features, like PLURAL, PROC and RES. These features are taken from a list of atomic semantico-syntactic features. Once the hierarchical structure is built up, lexical insertion takes place, whereby the abstract features get replaced by lexical items.

   - Underattachment (or underassociation): A verb can be inserted in a context where all or a subset of its features are present. For example, *stänga* and *samla* could be inserted in the following contexts (at least):

     (23) a. [Proc$_i$ [Res$_j$]]
     b. [Res$_i$]

     Försvinna could be inserted in the following two contexts (at least):

     (24) a. [Proc$_i$ [Res$_i$]]
     b. [Res$_i$]

   - Note that *stänga* and *samla* could not be inserted in the following context:

     (25) a. [Proc$_i$ [Res$_i$]]

     Note that *försvinna* could not be inserted in the following context:

     (26) a. [Proc$_i$ [Res$_j$]]

This mechanism of underassociation is in many senses similar to Pustejovsky's selective binding. The difference is mainly that in the system sketched above, underassociation is strictly a spell-out related phenomenon, and it is not forced by a selective head. The system sketched above also intertwines argument structure and event structure — taking care of both in the same hierarchical structure (see Ramchand 2008 for more detailed discussion). This makes it easy to handle argument and event structure changing operations in the syntax (instead of in the lexicon, where, at least in the Pustejovsky lexicon, the features are not hierarchically organized).

Combining subeventual heads, or introducing single (sub-)eventual heads, the outcome usually is a verb, but in certain contexts the outcome might be a noun (or nominalization) or an adjective (or participle). Since this paper is about (de-verbal) nouns, I will just focus on what is required for a structured set of sub-eventual heads to surface as a noun.

Nouns differ from verbs and adjectives in that they have lexically specified gender values (in Swedish, common gender or neuter). I will add gender/noun class information to the entries that can have a zero-derived nominal outcome. Below I give some potential lexical entries for verbs that have related zero-derived nominals:[5]

(27) a. *skiv* ('slice'): Common gender, Proc_i, Res_j (at least)
b. en skiva av brödet
a.CG *slice of bröd*.DEF
'a slice of the bread'
c. Jag skivade brödet.
I slice.PAST *bread*.DEF
'I sliced the bread.'

(28) a. *saml* ('collect'): Proc_i, Res_j (at least)
b. Han samlade (på) fjärilar.
he collect.PAST *(on) butterflies*
'he collected butterflies.'
c. en samling med över 100 recept
a.CG *collect*.NOM *with over 100 recipies*
'a collection of over 100 recipes'

The verb *skiva* in (27) will have a corresponding zero-derived result-nominal, since its lexical entry contains a gender feature in addition to the event features. The verb *samla* in (28) will however have an overtly derived result nominal, since its lexical entry does not contain a gender feature. In the next section, I will go through a couple of different verb classes, and show how their morphosyntactic and semantic properties can be derived from the underlying verbs.

4. Verb-classes and their nominals

Given a bipartite verb-phrase, and the possibility of merging gender features on top of any of the two parts, we expect three types of nominalizations (not taking into account nominalizations containing vP-external material):

(29) a. Gender [Res]
b. Gender [Proc]
c. Gender [Proc [Res]]

[5] I do however think that a lot more information need to be added to the entries.

In the three structures above, a gender feature has been merged on top of typical verbal features, with a nominal as the outcome. If, for example, an aspect feature or (or Proc in (29a)) had been merged instead, the outcome could have been a typical verb, unless a gender feature had been merged higher up in the structure (yielding e.g. a Poss-*ing*-nominal).[6]

All verbs that have a Res-feature could in principle be inserted in the (29a). If the root selected for insertion also has a gender feature in its lexical entry, it can lexicalize both Res and Gender. If it does not have a gender feature, *-(n)ing* will lexicalize the gender feature. There are many different sub-types of result nominal. Two examples are given below:

(30) a. Han staplade lådorna (i en hög stapel).
he pile.PAST *box*.PL.DEF *(in a high pile)*
'He piled the boxes (into a tall pile).'
b. en hög stapel av lådor
a.CG *high pile of boxes*
'a tall pile of boxes'

(31) a. Han repade bilen.
he scratch.PAST *car*.DEF
'he scratched the car.'
b. en repa påbilen
a.CG *scratch on car*.DEF
'a scratch on the car'

Note that also unaccusative verbs have nominalizations of this type:

(32) a. Isen sprack.
ice.DEF *cracked*
'The ice cracked.'
b. en spricka i isen
a.CG *crack in ice*.DEF
'a crack in the ice'

As we have seen above, some verbal lexical entries lack gender features, and a nominalizing suffix has to be inserted:

(33) a. en samling med över 100 recept
a.CG *collect*.NOM *with over 100 recipies*
'a collection of over 100 recipes'
b. en öppning i väggen
a.CG *open*.NOM *in wall*.DEF
'an opening in the wall'

It should be emphasized that all the nominalizations in (30)-(33) have the same underlying structure, i.e., [Gender [Res]]. The verbs with correspond-

[6] I will not discuss instrument and impact nouns in this paper. Presumably, they are sub-classes of the result nominals.

ing result nominals do in general also have event denoting nominals derived by *-(n)ing*, as shown below (note that the zero-derived nominal cannot be used here):[7]

(34) a. After *stapeln/staplingen av lådorna...
*after pile.*DEF*/pile.*NOM.DEF *of box.*PL.DEF
'After the piling of boxes...'

b. Vid skivning/*skiva av melon är det viktigt att tänka
*at slice.*NOM*/*slice of melon] is it important to think*
på...
on
'When slicing a melon, it is important to think about...'

The result nominalizations formed with *-(n)ing* tend to also have event-denoting nominalizations ending in *-(n)ing* (like *vid öppningen av affären* – 'At the opening of the store'), though the nominalizations formed with *-nde* are often preferred for the latter.

At the moment, we do not have a straightforward way of explaining why the zero-derived nominals always have fewer event entailments than the *(n)ing*-nominals. I will come back to this question in the end of this section.

The second type of nominalization contains only the feature Proc, in addition to the nominalizing gender feature:

(35) Gen [Proc]

In this class we find mainly nominals based on typical atelic verbs, mainly unergative verbs. A couple of examples are given below:

(36) *dans-* 'dance', *sång-* 'song', *lek-* 'play'

However, in Swedish, most unergative verbs have *(n)ing*-nominals rather than zero-derived ones, as examplified below:

(37) *sim-ning-* 'swim', *löp-ning-* 'run', *vandr-ing-* 'hike'

That is, this type of verb does not in general seem to have a gender features in its lexical entry. A sub-class of the Proc nominals are the nominals that are formed from verbs of sound emission. Many verbs of sound emission have zero-related nouns, where the noun refers to the sound itself, as ex-

[7]The verbs of "marking" tend to have a result denoting *(n)ing*-nominal in addition to the zero-derived result nominal. The *(n)ing*-nominals however tend to add some information about intentionality, that is, that the marking was done on purpose:

(i) Sulan har en grov räffling.
*sole.*DEF *has a rough groove.*NOM
'The sole has a rough groove/ribbing.'

Below we will see similar effects in process-denoting nominalizations.

emplified below (these verbs could be taken to be onomatopoetic, or they might at least qualify as ideophones):

(38) *dundrar*-'thunder', *knastrar*-'crunch', *knattrar*-'rattle', *kuttrar*-'coo', *kvittrar*-'chirp', *muttrar*-'mutter', *pladdrar*-'babble', *slamrar*-'clatter', *sluddrar*-'slur', *fnittrar*-'giggle'

The nouns formed from the verbs above are all mass denoting. There are also a lot of count denoting zero-derived sound-emission nouns like *rop* ('shout') and *skrik* ('scream'). Both sub-classes above usually only have one type of nominal. This is what we expect, since there is basically only one structure that can be nominalized (i.e., Proc). Sometimes though if the zero-derived nominal is a mass-noun, there is a *(n)ing*-nominal with additional +count, +intentional flavor, for example, *viskning* ('whisper') and *springning* ('running')). This suggests that splitting the verb phrase into two subevents is probably not enough. However in this paper, I will not elaborate on what a more finely de-composed VP would look like.

Complex events have both a process (or an initiation event) and a result event associated with them. The structure of the complex events should therefore be the following:

(39) Gender [Proc [Res]]

Only verbs that have both Res and Proc in their lexical entries, plus a gender feature that is associated with the first sub-event can form complex event denoting zero-derived nominals.

(40) a. köp av hus
buy of house
'house-buying'
b. stöld av pengar
theft of money
'theft of money'
c. Johans misshandel av Tommy
*John.*poss *assault of Tommy*
'John's assault of Tommy'

Many verbs that have a similar syntax and semantics to the ones in (40) have no related zero-derived nominals. Instead, for these verbs, the default gender marker *-(n)ing* has to be used, as in (41):

(41) a. polisens arrestering av boven
*police.*poss *arrest.*nom *of criminal*
'the police's arresting of the criminal'
b. avrättingen av X
*execute.*nom *of X*
'the execution of X'

c. säljning av hus
*sell.*NOM *of house*
'selling of house'

The difference in lexical entries between the ones in (40) and the ones in (41) is sketched below:

(42) a. *köp*: [Gender (neut), Proc_i, Res_j]
b. *sälj*: [Proc_i, Res_j]

Notice that the verbs of this class that have zero-derived nominals in general lack *(n)ing*-nominals altogether:

(43) a. ??köpning av hus
*buy.*NOM *of house*
int. 'buying of house'
b. *stjälning av pengar
*steal.*NOM *of money*
int. 'theft of money'
c. *mördningen av politikern
*murder.*NOM *of politician*DEF
'the murder of the politician'

This is predicted, given that we don't want to add the default gender marker *-(n)ing* to something that already has a gender value.[8]

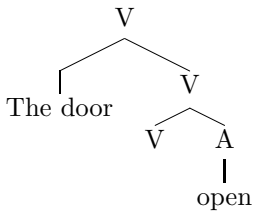
Exactly why the Gender feature is associated with the process sub-event is not clear. It could be the case that the first sub-event is not suitable as a noun - i.e., it could be based on a predicate-like relation rather than a entity (i.e., the solution could be captured in a fashion similar to Hale and Keyser). Another possibility is that a lot of the encyclopedic content of these verbs is associated with the process sub-event, and that therefore this sub-event has to be present in the syntax for the lexical item to be licensed. This could potentially be taken care of by assuming with Pustejovsky (1995) that verbs are "headed", i.e., one of the sub-events has a more prominent status than the other one. It would be desirable to say that the lexically stored gender feature always is located in the most deeply embedded sub-event. If this were the case, we could straightforwardly explain why we have pairs like $\textit{skiva}_{result}$ – $\textit{skiv-ning}_{event}$, but not any pairs where the result denoting nominal carries the *-(n)ing* suffix, and the eventive nominal is zero-derived. I will not try to give a final answer to this question in this paper.

[8]Note though that *misshandling* is well-formed (more or less), and is specifically often used in the plural, which seem to be correlated the slight weirdness of the plural ?*misshandlar*. I don't know why though.

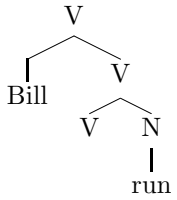
4.1. The noun-adjective parallel

In this section I wish to re-adress some questions raised in the work of Hale and Keyser (Hale and Keyser 1993 and Hale and Keyser 2002), that deal with the relation between argument structure and lexical categories. The structures Hale and Keyser assign to de-verbal and de-adjectival verbs are in the end identical, with the label of the most deeply embedded node being the only thing that differs, as illustrated below:

(44) a.



b.



The difference between nouns and adjectives according to Hale and Keyser is that adjectives require arguments, while nouns don't. The idea is that the argument in (44a) is somehow selected by the adjectival root (though licensed by the light verb), while the argument in (44b) is selected by the light verb. An extra light verb can be merged in the causative construction, introducing a causer argument. To capture the fact that de-nominal verbs usually don't have causative counterparts, you have to say that you can only have one lightverb per verb phrase that introduces its own argument.

In the system I sketched above on the other hand, the difference between an unergative and an unaccusative verb will not be in the category of the most embedded argument. Rather, unaccusative verbs will have both a Res feature and a Proc feature, while only the Proc feature will be present in the unergative verb. As has been shown above, unaccusative verbs can have related result nominals, that are either zero-derived or overtly derived, as seen below:

(45) a. a break in the stick
b. an opening in the wall

Unaccusative verbs can have either zero-derived or overtly derived "result" adjectives, as shown below:

(46) a. The TV is still broken (overtly derived adjective/participle)
b. The door is still open (zero-derived adjective)

The reason why the verb *break* has a zero-derived result nominal, while *open* only has an overtly derived nominal, is only a lexical accident. The entry for *break* has a gender feature, while the lexical entry for *open*doesn't. The reason why *open* has a zero-derived adjective, while *break* does not, would presumably also be a lexical accident in such case (though I do not want to speculate here what the adjective feature would be).

If the reasoning above is correct, there is no true correlation between lexical category and argument structure. All types of verbal structures could be turned into nouns or adjectives at any level. Whether the noun or adjective will come out as a zero-derived noun or adjective, or as an overtly derived nominalization or participle, would just depend on the features on the lexical entry of the verb targeted for insertion.

There are however many reason to believe that the reasoning in Hale and Keyser's work is in some way fundamentally correct, that is, that there is some correlation between argument structure (or event structure) and (lexical) category. However, the group of de-nominal verbs, in terms of Hale and Keyser (1993), needs to be extended to also include verbs that have overtly derived nominals with similar behavior as the zero-derived nominals. The group of de-adjectival verbs should also include verbs that have corresponding stative participles.

On the other hand, the fact that supports the Hale and Keyser hypothesis is the fact that unergative verbs basically never have corresponding zero-derived adjectives. Further, as argued in Lundquist (2008), unergative verbs can only be turned into adjectives once some additional structure has been merged on top of the ProcP. This is seen in the fact that participles, either present participles or passive (past) participles, formed from unergative verbs always have a fairly transparent semantic and syntactic structure associated with them. It is also the case that many verbs, most notably many unaccusative verbs, simply do not have any corresponding result nominalizations, though they have corresponding adjectives or stative participles. This suggests that the difference between nominals and adjectives should be structurally encoded. Gender features would in that case select for only certain structures and not others. I will not speculate here about what these structures would look like, or how they would differ from adjectival structures (but see Lundquist (2008) chapter 1 and chapter 8 for further discussion).

5. Summary

In many syntactic theories, people have tried to handle operations like passive formation and causative-inchoative alternations in a systematic fashion. In this paper I have tried to argue that any theory that wants to have a systematic account of e.g. passive formation, should also be able to handle noun-verb conversion in a similar fashion.

I have further sketched a system that in theory easily can handle noun-

verb-conversion, and that also captures the relation between zero-derived nominals and overtly derived nominals. In short, there are two factors that need to be taken into consideration when describing the relation, and for capturing the slightly irregular distribution of zero-derived nouns: (1) the event structure of the verb, and (2) the necessity of stored gender features in "verbal" roots. If no gender or noun class features are present in the lexical entry, the nominalizer *(n)ing* kicks in to form a nominal.

While there are still a lot of details that need to be worked out, I have tried to show that a theory which allows feature-rich lexical entries, together with a system of selective instantiation of those features (i.e., underassociation), has the potential to handle the richness and complexity of the patterns shown here, while still capturing the intuitive identity between lexical items showing up in quite different syntactic environments (e.g. N vs. V).

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