Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Noun-Verb Conversion without a Generative Lexicon

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Workshop on Clausal and Nominal Parallels
November 20-21, University of Aarhus, Denmark

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Overall theme and goal:

- **Overall Theme:** The lexicon-syntax interface
- **Goal:** Give a sketch of a model that systematically can handle Noun-Verb conversion, and show how this theory handles a couple of the cases exemplified in (1) below.

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Verb-noun pairs that seem to be related to the same underlying concept (from Swedish):

(1)   a.   pussa$_{verb}$ - en puss$_{noun}$ ('kiss') (Impact)
      b.   cykla$_{verb}$ - en cykel$_{noun}$ ('bike') (Instrument)
      c.   kvittra$_{verb}$ - (ett) kvitter$_{noun}$ ('chirp') (Sound)
      d.   stapla$_{verb}$ - stapel$_{noun}$ ('pile') (Result)
      e.   misshandla$_{verb}$ - misshandel$_{noun}$ ('manhandle/assault')
           (Event)

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

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.

I argue for the following answers:

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

1. The semantic relation between the verb and corresponding noun is in most cases transparent and predictable, taking the argument/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/declension class is added to verbal root, or event/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 4).

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

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

General sketch of the architecture of the system:

- A lexicon without any generative power.
- Highly specified lexical entries (each entry carrying a set of hierarchically ordered syntactically relevant features).
- A spell-out mechanism that allows lexical items to be inserted when only a subset of their features is present in the syntax.
- A fine-grained, semantics-oriented syntax.

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Structure of talk:

Section 2: Brief note on nouns, verbs and nominalizations

Section 3: Previous relevant work

Section 4: Sketch of framework

section 5: Some results

Section 6: Concluding notes

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Properties of nouns, verbs and nominalizations
Zero-derived nominals
Swedish nominalizations

Verb, noun or in between

- **Typical characteristics of verbs:**

  1. Morphology: Tense marking, Person agreement
  2. Syntax: Assign case to internal argument, select for a certain number of arguments, modified by (non-agreeing) adverbs.
  3. Semantics: Denote events

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Properties of nouns, verbs and nominalizations
Zero-derived nominals
Swedish nominalizations

- **Typical characteristics of nouns:**

  1. Morphology: Definiteness, number and gender marking (that mark number and gender properties of the noun itself, i.e., not agreement)
  2. Syntax: Occupy argument positions, do not assign accusative case, modified by (agreeing) adjectives.
  3. Semantics: denote objects

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Properties of nouns, verbs and nominalizations
Zero-derived nominals
Swedish nominalizations

- Nominalizations: in between

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Properties of nouns, verbs and nominalizations
Zero-derived nominals
Swedish nominalizations

Example from English:. A transitive finite verb with tense marking and person agreement, and two arguments carrying structural case.

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

Below , 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, Abney 1987 and Grimshaw 1990 for discussion of different types of *ing*-nominals).

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Properties of nouns, verbs and nominalizations
Zero-derived nominals
Swedish nominalizations

- POSS-*ing*:

> (3) [John's painting a picture featuring the recent disturbances in Los Angeles] caused a huge riot among the art people.

Verbal properties:

- Accusative case

- Denotes an event

- (Aux/pass)

Nominal properties:

- Possessive "subject"

- No tense

- Occupies an argument position

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Properties of nouns, verbs and nominalizations
Zero-derived nominals
Swedish nominalizations

- *ing of*-nominalization (or 'mixed' nominalization):

  (4)   A classic example is [John L's painting **of** a picture
         featuring the recent disturbances in Los Angeles].

Verbal properties:

- Denotes an event
- Internal argument

Nominal properties:

- Possessive "subject"
- No tense
- Occupies an argument position
- Genitive internal argument

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Properties of nouns, verbs and nominalizations
Zero-derived nominals
Swedish nominalizations

- Result nominal:

    (5)   [A painting (*of a picture featuring the recent
            disturbances in Los Angeles) by John L] hung on the
            wall

                              Nominal properties:

                              - Possessive "subject"

Verbal properties: - No tense

  - —   - Occupies an argument position

                              - No internal argument

                              - denotes an object

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Properties of nouns, verbs and nominalizations
Zero-derived nominals
Swedish nominalizations

Zero-derived nominals

Zero-derived nominals can never assign accusative case, but can denote events (examples from Harley 2007):

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

Zero-derived nominals can have the same properties as overtly derived de-verbal nouns (e.g., *-ing of*-nominalizations)

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Properties of nouns, verbs and nominalizations
Zero-derived nominals
Swedish nominalizations

Nominalizations in Swedish

- No accusative assigning nominalizations (like e.g. POSS-ing in English, or infinitival based nominals in e.g. German and Spanish)

- Two productively used nominalizing suffixes: *(n)ing* and *a/e-nde* (almost only used in event-denoting contexts, see Lundquist 2008 for details about the two nominalizations). Both of them have properties similar to the English mixed nominalizations.

(N)ing can take on a wide range of meanings (on top of the event-denoting) as shown in the next slide (from Loman 1964):

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Properties of nouns, verbs and nominalizations
Zero-derived nominals
Swedish nominalizations

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'

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Properties of nouns, verbs and nominalizations
Zero-derived nominals
Swedish nominalizations

- Zero-derived nominals (and nominals derived by a couple of non-productive suffixes) seem to have the same range in meaning as *(n)ing*-nominals. (in this talk I will say nothing about the place (*loci*), time *temporis* and agent *agentis* nominals listed above).

- Judging from the following data, *-(n)ing* and ∅ seem to be in complementary distribution. Are they allomorphs? Do they "block" each other?

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Properties of nouns, verbs and nominalizations
Zero-derived nominals
Swedish nominalizations

Blocking?

- Sound emission:

  (7) 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'

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Properties of nouns, verbs and nominalizations
Zero-derived nominals
Swedish nominalizations

Blocking?

- Activity verbs/event nominals:

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

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

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Properties of nouns, verbs and nominalizations
Zero-derived nominals
Swedish nominalizations

Blocking?

- Result nominals:

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

   b. Han har en stor samling/   *sam(m)el med
        he has a big collect.NOM/ *collect   with
        gamla serietidnignar.
        old   cartoons
        'He has a big collection of old cartoons'

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Properties of nouns, verbs and nominalizations
Zero-derived nominals
Swedish nominalizations

Blocking?

- Achievement verbs/event denoting nominals:

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

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

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Properties of nouns, verbs and nominalizations
Zero-derived nominals
Swedish nominalizations

Clear asymmetry between *(n)ing*-nominals and zero-derived
nominals, as shown below:

(11) a. Det står en hög stapel/# stapling med gamla lådor
          på golvet.
          There is a high pile of old boxes on the floor.
      b. Efter staplingen av tunga lådor var vi ganska trötta.
          After the piling of old boxes we were rather tired.

(12) a. Han använde paddeln för att ta sig fram genom
          kanalerna.
          He used the paddle to move through the channels.
      b. Efter paddlingen var vi ganska trötta.
          After the paddling we were rather tired.

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Properties of nouns, verbs and nominalizations
Zero-derived nominals
Swedish nominalizations

	Result/Instrument	Event
ATTESTED	$(\emptyset)$	$\emptyset$
ATTESTED	$\emptyset$	-(n)ing
ATTESTED	-(n)ing	-(n)ing
UNATTESTED	-(n)ing	$\emptyset$

If both zero-derived and -(n)ing-derived nominalizations are
available, the (n)ing-nominalizations always have more event
entailments than the zero-derived.

Claim: Verbal lexical entries that have related zero-derived nouns
need to contain noun features in addition to verb-features.
Noun-features = Gender/Noun-class features. Nominalizing
suffixes provides Gender/Noun class when these features are not
present in the lexical entry (i.e., for a verb that lacks a zero-derived
nominal).

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Pustejovsky (1995)
Hale and Keyser (2002)
Distributed Morphology

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.

- How to capture the fact that one and the same root can fit into many different (morpho)syntactic contexts?

(13) a. Johan misshandlade Tommy (Active)
          'John assaulted Tommy'
      b. Tommy blev misshandlad av Johan (Passive,
          Adjective)
          'Tommy was assaulted by John'
      c. Johans misshandel av Tommy
          'John's assault of Tommy' (Nominal)

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Pustejovsky (1995)
Hale and Keyser (2002)
Distributed Morphology

- How to capture the fact that one and the same root can give rise to different (but related) semantic interpretations?

Stative passive:

(14)   Dörren är fortfarande stängd
       'The door is still closed'

Resultative nominals:

(15)   en repa
       a scratch

Causative/inchoative pairs:

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

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Pustejovsky (1995)
Hale and Keyser (2002)
Distributed Morphology

- Anyone who wants to capture the relation between 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.

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Pustejovsky (1995)
Hale and Keyser (2002)
Distributed Morphology

Intermediate conclusions

1. Zero-derived de-verbal nouns should be treated as a type of nominalization.

2. Nominalizations should be treated as other valency and/or category changing operations (i.e., passives, participle formation, causativizations etc.)

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Pustejovsky (1995)
Hale and Keyser (2002)
Distributed Morphology

Previous attempts, Pustejovsky 95

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). 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/features (the features a verbal root carries will help determine the interpretation of the zero-derived nominal)

2. a mechanism which allows only a subset of the information/features in the lexical entry to surface in the syntax (via the operation Type Coercion or Selective Binding).

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Pustejovsky (1995)
Hale and Keyser (2002)
Distributed Morphology

Hale and Keyser

Relationship between lexical category and argument structure:

(17)   a.   John coughed (de-nominal verb) – [do [cough$_n$]]
         b.   The door opened (de-adjectival verb) – [happen/do [open$_a$]]

(18)   a.   *He coughed the baby.
         b.   John opened the door.

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Pustejovsky (1995)
Hale and Keyser (2002)
Distributed Morphology

- Adjectives require arguments – nouns don't ("Adjectives project a specifier").
- Arguments of de-nominal verbs are licensed or selected by the light-verb.
- Arguments of de-adjectival verbs are selected by adjective, but licensed by light-verb. The light-verb can select an argument of its own as well (creating a causative construction).
- Chierchia and Turner (1988): Adjectives are predicable individuals, and need to "located' in another individual to be able to denote. Nouns are non-predicable, and can denote something in themselves.

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Pustejovsky (1995)
Hale and Keyser (2002)
Distributed Morphology

Two problems with Hale and Keyser's approach

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'

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Pustejovsky (1995)
Hale and Keyser (2002)
Distributed Morphology

2. Verbs that seem to be based on typical nominal concepts do not necessarily have a corresponding zero-derived nominal.

(20)   a.   Under dansen/??dansningen började jag bli trött.
            'during the dans/dance-ing I started to get tired'
       b.   Under vandringen/*vandren började jag bli trött.
            'During the hiking/hike I started to get tired'

Participles/de-verbal adjectives further illustrate this point:

(21)   a.   The door is still closed/*close
       b.   The door is still open/*opened

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Pustejovsky (1995)
Hale and Keyser (2002)
Distributed Morphology

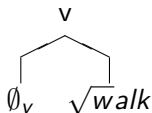Distributed Morphology (DM, see Halle and Marantz 1993 and
Harley and Noyer 1999):

1. Syntax is the only generative component in human language
   (i.e., no generative lexicon).
2. Both words and sentences are built up in the syntax with help
   of the same mechanisms (basically Merge).
3. Strict distinction between lexical material/roots and
   functional material.
4. Roots are category neutral, i.e. not specified for lexical
   category.
5. Lexical category is assigned to the roots in the syntax with
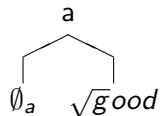   help of functional categories, like n(oun), v(erb) and
   a(djective).

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Pustejovsky (1995)
Hale and Keyser (2002)
Distributed Morphology

Lexical categories in DM

Noun:

$$
\begin{array}{c}
n \\
\diagup\diagdown \\
\emptyset_n \quad \sqrt{walk}
\end{array}
$$

Verb:

$$
\begin{array}{c}
v \\
\diagup\diagdown \\
\emptyset_v \quad \sqrt{walk}
\end{array}
$$

Adjective

$$
\begin{array}{c}
a \\
\diagup\diagdown \\
\emptyset_a \quad \sqrt{good}
\end{array}
$$

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Pustejovsky (1995)
Hale and Keyser (2002)
Distributed Morphology
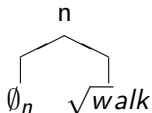
Even though DM easily captures the syntactic/categorical instability of lexical items, it vastly over-generates, and it has no way of capturing the fine-grained lexical patterns shown by e.g. Pustejovsky (1995), or the relations between category and argument structure pointed out by Hale and Keyser (2002).

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

The desired system

- A rich lexicon, 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).

- A system where lexical category is not straightforwardly determined at the lexical level (as in Distributed Morphology).

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

See e.g. Lundquist (2008) for a system with the properties mentioned above.

The ideas building loosely on Nanosyntax – see Starke (2009) for an overview, and Ramchand 2008, Caha 2009, Svenonius 2006, and Taraldsen to appear for work in this spirit.

A couple of important ingredients:

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

- Verbal entries carry information about event structure and argument structure (at least).

- The verb phrase can be decomposed into two or more subevents, as in Pustejovsky (1995) or Ramchand (2008).

    1. Pustejovsky: Process → Result
    2. Ramchand: Initiation → Process → Result

    (in this talk, I will only make use of Process and Result)

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

- 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.)

  (22) a. Stänga $_{Transitive}$ ('close'): Proc$_i$, Res$_j$
        b. Samla $_{Transitive}$ ('collect'): Proc$_i$, Res$_j$
        c. Försvinna $_{Unacc}$ ('disappear'): Proc$_i$, Res$_i$
        d. Skratta $_{Unerg.}$ ('laugh'): Proc$_i$

- Specification in verbal entries: Co-reference relation between arguments of a verb, temporal relation between sub-events and presence/absence of sub-eventual heads (see Pustejovsky 1995 and Ramchand 2008).

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Lexical insertion

- **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.

- **Under-attachment:** A lexical item can be inserted in a context where all or a subset of its features are present.

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

E.g. *stänga* ('close') and *samla* ('collect') could be inserted in the following contexts (at least):

(23)   Stänga/samla$_{Transitive}$: Proc$_i$, Res$_j$

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

But not this one:

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

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

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

    (26)   Försvinna$_{Unacc}$ ('disappear'): Proc$_i$, Res$_i$

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

But not in the following:

    (28)   [Proc$_i$ [Res$_j$]]

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

- Combining subeventual heads, or introducing single (sub-)eventual heads, the outcome usually is a verb – though nominalizing morphology or participial morphology can be merged instead of e.g. T, or Asp (or whatever you have above the verb phrase)
- Nouns differ from verbs and adjectives in that they have lexically specified gender values (in Swedish, common gender or neuter).

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Verbs with corresponding zero-derived nouns have
gender/noun-class features in addition to the verbal features:

(29) a. skiv ('slice'): Common gender, Proc_i, Res_j (at least)
     b. en skiva av brödet
        'a slice of the bread'
     c. jag skivade brödet
        'I sliced the bread'

(30) a. saml ('collect'): Proc_i, Res_j (at least)
     b. han samlade (på) fjärilar
        'he collected butterflies'
     c. En samling med över 100 recept
        'a collection of over 100 recipes'

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

The nature of nominalizing morphology

- Nominalizing morphology: Default gender/noun-class information.
- Gender (maybe) provides a referential index (see Baker 2003)
- Otherwise, nominalizing morphology is semantically vacuous – temporal and aspectual information is provided by the complement of the nominalizer (i.e., the underlying verb + potential tense/aspect markers).
- Nominalizing affixes are specified for a specific "attachment height", which makes it look as if they have some inherent semantics.
- Nominalizing morphology (i.e., default gender), can still not attach to everything that lacks an inherent gender feature – but only to non-predicable individuals (Chierchia and Turner 1988)

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

How to capture the "competition"

(31) köp - *köpning
      buy - buy-ing

You cannot add gender features to something that already has gender features.
Inherent gender features of verbs seem to be located in the most deeply embedded layer.

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Different types of Results
Different types of Processes/activities/simple events
Different types of Complex Events

Results

A lot of different types of verbs have corresponding resultative nominals. The structure for these nominals is given below:

(32)   Gen [Res]

Only items that have a res-feature can be inserted in this contexts. If the item you want to insert don't have a gender feature in its lexical entry, use *(n)ing* for lexicalizing Gen. If the lexical item has a gender feature (and a res-feature), it can lexicalize both Gen and Res.

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Different types of Results
Different types of Processes/activities/simple events
Different types of Complex Events

Collecting/Arranging

(33)   a.   Han staplade lådorna (i en hög stapel)
            'He piled the boxes (into a tall pile)'
       b.   En hög stapel av lådor
            'a pile of boxes'

Other verbs of this kind are given below:

(34)   Bunta, lista, rada (upp)
       bundle, list, line (up)

These verbs do have corresponding event-related *-(n)ing*-nominals
(*stapling av lådor*)

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Different types of Results
Different types of Processes/activities/simple events
Different types of Complex Events

Taking apart

- (35) a. han skivade melonen (i tunna skivor)
          'he sliced the melon (in thin slices)'

  b. en tunn skiva av melonen
      'a thin slice of the melon'

- (36) strimla, splittra(mass)[1], dela, filéa, ?stycka, skiva, smula

Event-denoting with *(n)ing*:

- (37) [vid skivning/*skiva av melon] är det viktigt att tänka på...
          'When slicing a melon, it is important to think about...'

---

[1]*splittrING* can be inerpreted as an object-denoting count-noun: "en splittring i partiet"

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Different types of Results
Different types of Processes/activities/simple events
Different types of Complex Events

Marking

- (38) a. han repade bilen
          'he scratched the car'
       b. en repa på bilen
          'a scratch on the car'

- (39) skrynkla, räffla, märka, mönstra, skada
       wrinkle, groove, mark, pattern, injure

Also result-denoting -(n)ing-nominals – "intentional marking"

- (40) sulan har en grov räffling
       the sole has a rough groove/ribbing

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Different types of Results
Different types of Processes/activities/simple events
Different types of Complex Events

Processes, activities, simple events

(41)   Gen [Proc]

(42)   dans, sång, lek
        dance, song, play

More often, *-(n)ing*-nominals:

(43)   sim-ning, löp-ning, vandr-ing
        swim-NOM, run-NOM, hike-NOM

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Different types of Results
Different types of Processes/activities/simple events
Different types of Complex Events

Sound

(44)   dundrar, knastrar, knattrar, kuttrar, kvittrar, muttrar,
        pladdrar, slamrar, sluddrar, smattrar, fnittrar
        thunder, crackle, clack, coo, chirp, blabber, clanging, slur,
        smatter, giggle

Both sub-classes above usually only have one of the nominal –
though if the zero-derived nominal is a mass-noun, there is usually
a *(n)ing*-nominal with additional +count, +intentional flavor.

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Different types of Results
Different types of Processes/activities/simple events
Different types of Complex Events

Complex events

(45)   Gen [Proc [Res]]

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

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Different types of Results
Different types of Processes/activities/simple events
Different types of Complex Events

(46)   a.   köp   av hus
            buy$_N$ of house
            'House-buying'
       b.   stöld av pengar
            theft of money
       c.   Johans misshandel av Tommy
            John's assault of Tommy

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Different types of Results
Different types of Processes/activities/simple events
Different types of Complex Events

Many verbs that have a similar syntax/semantics as the ones in
(46) have no related zero-derived nominals. Instead, for these
verbs, the default gender marker *(n)ing* has to be used, as in (47):

(47)   a.   polisens arrestering av boven
              The police's arresting of the criminal

        b.   Avrättingen av X
              'The execution of X'

        c.   säljning av hus
              'selling of house'

(48)   a.   Köp: [Gender (neut), $Proc_i$, Res_j]

        b.   sälj: [$Proc_i$, Res_j]

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

Different types of Results
Different types of Processes/activities/simple events
Different types of Complex Events

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

(49) a. *köpning av hus
          'buy-ing of house'
     b. *stjälning av pengar
          steal-ing of money
     c. *mördningen av politikern (cf. mordet på(?av)
          politikern)
          murder-ing of the politician (cf. the murder of the
          politician)

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

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.

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

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/declension class features in "verbal" roots. If no gender/declension class features are present in the lexical entry, the nominalizer *(n)ing* kicks in to form a nominal.

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

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, 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).

Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

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Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

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Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

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Intro
Verb, noun or in between
Previous attempts to capture instability
Framework/Tromsø/Nanosyntax
Types of relations
Summarizing
References

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