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Deverbal nouns as hybrids: some textual aspects

1. Introduction

Nominalization has for several decades been a central area of research in general linguistics. The early works of Lees (1960) and Vendler (1967, 1968) had a great influence on later treatments such as Chomsky's analyses in the seventies (Chomsky 1970). The main discussion was whether nominalization was primarily a syntactic or a lexical phenomenon.

Jane Grimshaw's MIT dissertation concentrated on deverbal nominalizations and claimed that certain types of deverbal nouns had argument structure and that the presence of argument structure in nouns correlated with some basic aspectual characteristics of the denotation of these nouns (Grimshaw 1990).

Grimshaw used English data only, but these properties turned out to be relevant for other languages as well, and the semantic and syntactic structure of basic deverbal nouns have been investigated for several languages of the world. However, the pragmatic and text linguistic aspects of the phenomenon have been studied to a much lesser degree.

As far as studies in the field of terminology and LSP are concerned, surprisingly few extensive works on the subject are available. This is rather surprising considering the fact that most introductory text books on terminology and LSP focus on the fact that nominalization is one of the most salient features of LSP texts of all sorts.

Michael Halliday's works constitute an exception to this generalization. His treatment of the role of nominalizations in the development of English scientific writing from Newton and Priestly to the

present day is both stimulating and interesting reading (Halliday/Martin 1993).

Against this background I found the need to have a closer look at this type of word formation in Norwegian technical writing. I have gathered my data from one of the system manuals from the Gullfaks A-platform system "Dampsystemet" (Steam Generation and Distribution System), an instruction manual for Norwegian technical personnel at the platform. The dominant text type in the manual is instruction with some passages of pure description. There are no explanatory or expository parts.

2. Deverbal nouns

But first: What is a deverbal noun? A deverbal noun is a noun which is derived from or corresponds to a verb, as in *aktivering*, activation (from *aktivere*, 'to activate'), *sjekk*, 'check' (from *sjekke*, 'to check'). The manual contained 154 deverbal nouns counted as types (the number counted as tokens is considerably higher).

There are several different morphological classes of deverbal nominal suffixes. A number of studies have shown that the different classes tend to behave differently on all levels of description and it is important to distinguish between them.

3. Morphological classes in Norwegian

The most productive of the Norwegian deverbal morphological classes is *-ing*. A list showing the number of occurrences with this suffix and the others in the manual is given in Table 1 where the *-ing* suffix marks more than 50% of the deverbal nouns.

Morphological type	sum
-(n)ing	88
[root]	31
-sjon	16
-asje	5
Infinitive	4
-anse	2
-sel	2
-skap	1
-t	1
-else	4
Total	154

Table 1. Occurrences of morphological types.

All the nominal types have different types of compound structure. Some forms are simple nouns, like *styring* ('control'), *drenering* ('drain') and *arbeid* ('work'). Others are compound nouns where the first element in the compound may correspond to a sentence constituent function of the corresponding verb, like the direct object in *slangetilkopling* ('hose connection') (*kople slange til noe* ('connect a hose to something'), an adverbial in *kraftforsyning* ('power supply') (*for-syne med kraft*, 'supply with power') or a predicative element as in *rengjøring* ('back washing') (*gjøre noe rent*, literally 'to make something clean'). These compound words may also occur as phrases where the first element occurs in postnominal position as a prepositional modifier. It is generally known that sentence functions like the subject and the direct object are marked in a different manner than adverbial functions (called adjuncts) in the nominalization process. The grammatical subject is usually marked by a possessive construction and the direct object is marked by the preposition *av* ('of'), as in:

- (1) Arbeiderens overvåking av dampforsyningen
(‘The workers’ surveillance of the steam production’).

However, the possessive subject is hardly ever realised in these kinds of technical texts.

3.1 -ing nominals

The *-ing* nominals are the most productive morphological type in Norwegian. A list of some of the *-ing* words are given in List 1.

List 1. *-ing* nominals

Innledning ('introduction'), distribuering ('distribution'), rengjøring ('back wash'), plassering ('location'), fordeling ('distribution'), avblåsing ('blow down'), vannbehandling ('water treatment'), forutsetning ('precondition'), rutinesjekking ('routine checking'), styring ('control', 'stabbing'), overvåking ('monitoring'), aktivering, ('activation'), avstenging ('shut down'), levering ('delivery', 'supply'), produksjonsboring ('production drilling'), regulering ('regulation'), gjennomføring ('completion'), utløsning ('activation'), tilsetning ('addition'), kraftforsyning ('power supply'), isolering ('isolation'), slangetilkopling ('hose connection'), utblåsingssikring ('blow out prevention', 'blow out preventor'), sikring ('securing', 'fuse'), nødavstenging ('emergency shut down'), utprøving ('commissioning'), tilbakemelding ('feed back'), feilsøking ('trouble shooting'), feilretting ('fault removal'), alarmregistrering ('alarm registration'), handling ('action'), opplæring ('training'), erfaring ('experience'), oppbygging ('construction'), skadevirkning ('harmful effect'), langtidsvirkning ('long term effect'), påvirkning ('impact'), drenering ('drain'), trykkavlastning ('pressure release'), åpning ('opening', 'port').

The distribution of morphological types on phrase level for the direct object and word level are given in Table 2. As we can see, transitive derivation with phrase marked derived direct object (the type *tilkopling av slange*, 'connection of hose') is very common with *-ing* nominals.

Morphological type	Phrase with derived direct object	Word		sum
		Compound	single	
-(n)ing	39	20	29	88
[root]	6	16	9	31
-sjon	1	4	11	16
-asje	0	3	2	5
infinitive	1	2	1	4
-anse	0	2	0	2
-sel	0	0	2	2
-skap	0	0	1	1
-t	0	1	0	1
-else	3	1	0	4

Table 2. Distribution of morphological types on the phrase level (with derived direct object) and word level.

Phrase with derived object: *behandling av vann* ('treatment of water')

Compound: *vannbehandling* ('water treatment')

Single word: *behandling* ('treatment')

3.2 Root nominals

Another common type of derivation is the root nominalization where the corresponding nominal is formed with zero derivation from the stem (also called conversion). A list of these is given in list 2:

List 2 Root nominals

Start ('start'), stopp ('stop'), rengjøringsarbeid ('back wash work'), sjekk ('check'), kaldstart ('cold start'), anleggssjekk ('field check'), feltpanelsjekk ('field panel check'), ventilsjekk ('valve check'), uttak ('outlet'), kraftforbruk ('power consumption'), avvik ('deviation'), leveringstrykk ('discharge pressure'), driftstans ('shut down'), prosessvedlikehold ('process maintenance'), utdrag ('abstract'), krav ('demand'), vedlikehold ('maintenance')

In addition there were seven other morphological types, but none of these are productive suffixes in Norwegian. A survey is given in list 3.

List 3 Low productive types

-*sjon*, as in dampproduksjon ('steam production'), aksjon ('action'), operasjon ('operation'), konstruksjon ('construction'), modifikasjon ('modification'), korrosjon ('corrosion'), isolasjon ('isolation').

-*asje*, as in lekkasje ('leak'), pakningslekkasje ('gasket leak').

-*else*, as in arbeidstillatelse ('work permit'), utstedelse ('issue'), overholdelse, forståelse ('comprehension', 'understanding')

infinitive form: skade ('damage') (from å skade, 'to damage'), miljøskade ('environmental damage')

-*anse*, as in vannleveranse ('water supply'), dampleveranse ('steam supply')

-*skap*, as in kjennskap ('knowledge')

-*t*, as in pumpedrift ('pump running').

4. Prototypical properties of nouns and verbs

Deverbal nouns are hybrid forms between the categories noun and verb. This means more specifically that they share some characteristics typical of verbs and some characteristics typical of nouns. According to Hopper/Thompson (1985) a set of characteristics for the two major parts of speech can be given. Those relevant for our purposes are listed in List 4.

List 4: Prototypical properties of nouns and verbs:

Nouns	Verbs
(Specific/anaphoric) reference,	description/no reference
Entities/objects	events
Countability	non-countability
+Pluralization	- pluralization
+ Determiner	determiner
Static meaning	dynamic meaning
Given/old information	new information
No argument structure	argument structure
Topic	Comment

Typical nouns have specific reference as opposed to typical verbs which do not refer at all. Typical nouns denote countable entities or objects and are easily pluralized as opposed to verbs. Because nouns have entity reference, they typically occur with determiners, again in contrast to verbs. Nouns typically have a static denotation as opposed to verbs, which have dynamic meaning. On the level of information

structure nouns tend to occur as sentence topics (or themes) with given or old information, whereas verbs with their associated participants tend to occur as sentence comments (or rhemes).

5. Deverbal nouns as non-prototypical nouns

Deverbal nouns do have reference, but they tend to have generic reference more often than specific reference. When expressing generic reference they often lack determiners, plural markers and have argument structure, especially a derived direct object marked by the preposition *av* ('of'). With generic reference they tend to express a dynamic meaning of process.

The ability to refer is a typical nominal property. The most typical way of reference for nominals in texts is the anaphoric reference where an antecedent is involved. This characteristic is also shared by deverbal nouns:

- (2) Ferskvann tilføres matevannstanken gjennom en tilbakeslagsventil 55-152WP. Vannets innløpstrykk kan avleses på trykkindikator 55-PIO013. Vanntilførselen blir regulert av en flottørventil, [...] (Chapter 2.2.1)
(Desalinated water is supplied to the water break tank via a check valve, 55-152 WD. The inlet water pressure is indicated on a pressure indicator, 55-PIO013. The water supply is controlled by a mechanical level control valve [...]).

The deverbal noun *vanntilførselen* ('the water supply') refers anaphorically to the first sentence *Ferskvann tilføres matevannstanken* which is the antecedent expression.

Another type of reference is exophoric reference where the sender goes outside the text to refer to events or entities which are assumed to be familiar to the receiver:

- (3) Lav-lavt nivå i tanken blir overvåket via nivåbryteren 55-LSLL017, som er innstilt på 816 mm. [...] Fellesalarm 55-UA001 blir utløst på BT i SKR, og alarm 55-LALL017 blir utløst på feltpanelet i M23. Aktivering av nivåbryter 55-LSLL017 vil også stoppe driftsmatepumpen (chapter 2.2.1).
(Level switch low low, 55-LSLL017, trips on low water levels, [...].)Activation of level switch 55-LSLL017 will ...)

The deverbial noun *aktivering av nivåbryter* ('activation of level switch') has not been introduced into the text earlier and the sender seems to imply that procedures for activation of level switch 55-LSLL017 are either taken for granted or considered to be irrelevant in the current context. Here the first alternative seems to be the most likely one.

A third type of reference is the generic reference. This is a rather special and untypical type of reference for nouns. Generic reference with typical nominals can be used in classificatory use with the definite articles in Norwegian (examples 4 and 7), and with the indefinite article in the singular (example 6) and in the indefinite plural (example 5), but the use of a naked form of the noun with generic reference is not so much used with ordinary nouns in Norwegian, especially in classificatory use, and seems to be ungrammatical in English (example 8):

- (4) Hest-en er et pattedyr. -definite article singular
The horse is a mammal.
- (5) Hest-er er pattedyr.-indefinite article plural
Horses are mammals.
- (6) En hest er et pattedyr.-indefinite article singular
A horse is a mammal.
- (7) Hest-ene er pattedyr. -definite article plural
The horses are mammals.
- (8) ?Hest-() er pattedyr.
*Horse is a mammal

However, generic reference with a naked deverbial noun as head is a very common type of reference with deverbial nouns as in example 9:

- (9) Generic reference:
Dampen blir brukt til *rengjøring av prosessbeholdere* og forskjellige andre rengjøringsarbeider på plattformen. (chapter 2.1.)
(The steam is used for *steam cleaning / purging of process vessels* and for general cleaning purposes on the platform.)

Here the reference is to *rengjøring* ('cleaning', 'purging') in general and no specific instance of activity is implied.

Table 3 shows that generic reference is the dominant one in this text.

Morphological type	Generic Non-specific	Anaphoric Specific inside text	Exophoric specific/non-specific outside text
-(n)ing	74	8	44
[root]	24	4	6
-sjon	5	9	6
-asje	2	2	2

Table 3. Distribution according to reference type.

Here the exophoric non-specific type in column 4 is a subtype of the generic type in column 2. This explains why the figures do not add up with the sums in Table 2.

Table 4 shows clearly that this type of generic reference with a naked noun is the dominant type in this text, at least with the two most productive morphological forms.

Morphological type	Naked form	Indefinite article singular	Indefinite form plural	Definite article singular	Definite article plural	Sum
-(n)ing	80	1	2	3	2	88
[root]	30	0	0	1	0	31
-sjon	7	0	3	5	1	16
-anse	0	0	0	2	0	2
-sel	2	0	0	0	0	2
-skap	1	0	0	0	0	1
-t	1	0	0	0	0	1
-else	4	0	1	0	0	4

Table 4. Form of deverbial noun (definite, indefinite article, singular, plural).

6. Logical polysemy

Most deverbals are event referring, but some have a dynamic, process meaning of an event and others refer to the result of the event and have a static, result meaning. Many deverbals can have both these meanings. This is a phenomenon called logical polysemy (Pustejovsky 1998: 31ff). Logical polysemy is a type of polysemy which is not idiosyncratically isolated to specific lexemes or terms in a language but which comprises large classes of lexemes. One of the most central and widespread types of logical polysemy concerns the distinction between process and result meanings of event referring nouns. This polysemy is closely related to deverbals but can also occur with other types of nouns. In example 10 we have process meaning and in 11 we have result meaning:

- (10) Process:
Standardprosedyre for *isolering* av reguleringsventiler (Dampsystemet chapter 4.2.4)
(Standard control valve *isolation*.)
isolering ('isolation') refers to an unspecified, generic, complex process event.
- (11) Result:
Isoleringen i veggene var brennbar
(The *isolation* in the walls was combustible.)
isoleringen refers to the result of the process of isolation, in this case the material used in the process.

In other cases the logical polysemy takes the form of an aspectual difference where the process meaning has a durative or imperfect meaning, as with the root nominal in 12, in contrast to the perfective instantiating meaning of the result meaning of the same nominal in 13:

- (12) Process:
Sjekk av manuelle ventiler må stemme overens med sjekklisten.
(Check of manual valves must agree with the check list.)
- (13) Result:
Hvis ventilen ikke åpner seg må *sjekken* tas på nytt.
(If the valve does not open the check must be performed once more.)

This is connected to the instantiating meaning of 13 as opposed to the generic meaning of 12. In 13 an important part of the meaning of the nominal is the instantiation of the general event of checking. A closely connected and important difference between 12 and 13 is that pluralization is possible in 13, but not in 12.

As we can see, there are various subtypes of process and result polysemy, but they seem to be variations of the same type of polysemy.

In the Steam Generation and Distribution System manual this polysemy type was very widespread, especially with the two most productive morphological types *-ing* and root nominals, as Table 5 shows. 69 of 88 *-ing* nominals and 29 of the 31 root nominals had logical polysemy.

Morphological type	Yes	No
-(n)ing	69	19
[root]	29	2
-sjon	11	5
-asje	5	0
Infinitive	0	4
-anse	2	0
-sel	2	0
-skap	0	1
-t	0	1
-else	2	2

Table 5. Presence of logical polysemy.

7. Argument structure

The presence of argument structure can best be detected by looking for the realization of the derived direct object at the phrase level, where it is overtly marked by the preposition *av* ('of'). The phrase type is that of: *tilkopling av slange* ('connection of hose'), where *slange* is the derived direct object of *tilkopling*.

Table 2 showed that many *-ing* nominalizations occurred on phrase level with unpacked derived direct objects. Some of the other forms also had this phrase structure. As list 4 illustrates this is a typical verbal characteristic. Table 6 further illustrates that this verbal characteristic matches with another verbal characteristic: the dynamic, process meaning. All the *-ing* nominalizations in unpacked phrase form with *av*-marked direct objects had dynamic process meaning and only one of the root-nouns had a result meaning. This is a fairly strong indication that presence of argument structure and dynamic meaning tend to merge in showing the verbal side of deverbal nouns.

Morphological type	Process	Result
-(n)ing	34	0
[root]	4	1
-sjon	1	0
-asje	0	0
Infinitive	0	0
-anse	0	0
-sel	0	0
-skap	0	0
-t	0	0
-else	1	2

Table 6. Distribution of process-result polysemy in deverbal nouns with derived direct objects marked by the preposition *av* ('of').

Table 7 shows, further, that those deverbal nouns without logical polysemy (for example those that are unambiguous) tended to have a process meaning with *-ing* nouns (the most productive type) and result meaning with root nouns. This should indicate that deverbal *-ing* nominals are more verbal than deverbal root-nominals in this technical Norwegian text.

Morphological type	process	result	place
-(n)ing	18	1	0
[root]	0	2	0
-sjon	2	3	0
-asje	0	0	0
Infinitive	0	0	0
-anse	0	0	0
-sel	0	0	0
-skap	0	1	0
-t	1	0	0
-else	0	2	0

Table 7. Sense type with absence of logical polysemy.

8. Information structure

From the point of view of information structure information in text sentences can be divided into topic (theme) and comment (rheme) positions. Topic position is the first constituent of the sentence and normally contains the grammatical subject of the sentence, which is typically the point of departure, i.e. what is talked about. The comment position is regarded as being the rest of the sentence, to put it simply. In my data I have classified the deverbal noun types according to this distribution. As is well known, topic vs comment marking typically corresponds to given vs new information.

But this distribution can sometimes be overridden for various information structure purposes. The terms 'given' and 'old' information are often used synonymously in the text-linguistic literature, but for my purposes I feel a need to make a distinction between the two:

Given information is a type of information which is previously introduced in the co-text, usually in comment form. This information is picked up again later and backgrounded by the sender, usually in topic position. Old information, on the other hand, is a type of information that the sender assumes to be known to the receiver without prior introduction. This information may be classified as what Clark (1994) calls common ground knowledge.

Both given and old information are typically linked to reference types of typical nominal expressions. Given information is associated with anaphoric reference where the earlier introduced information is the antecedent (as in example 2 above). Old information is associated with exophoric reference, where the nominal expression refers to a piece of information which is outside the text in the assumed common ground knowledge space of the sender and the receiver (as in example 3 above).

Table 8 illustrates the distribution of the morphological types according to information structure. As we can see the topic and given/old information go together as expected (see also the final item on list 4, where topic position is the typical position of ordinary nouns).

But deverbal nouns can also occur as comments with new information or even with given or old information. This seems to be typical especially of instruction texts. In the manual the instruction passages had almost exclusively the form of imperative clauses. Imperative clauses do not have the regular topic-comment structure and are normally topicless constructions. So the most likely interpretation of the non-typical occurrence of deverbal nouns in comment position is the result of the instruction text type rather than the result of the non-typical character of the deverbal nouns.

Morphological type	Topic and given information	Topic and old information	Comment and new information	Comment and given / old information	Topic and new information
[root]	15	14	25	9	0
-sjon	12	5	7	1	0
-asje	5	1	8	1	0
infinitive	1	0	3	1	0
-anse	0	0	4	0	0
-sel	0	2	0	0	0
-skap	0	1	0	1	0
-t	0	1	0	0	0
-else	1	0	3	0	0

Table 8. Distribution according to information structure.

9. Conclusions

This survey shows that deverbal nouns share characteristics of both nouns and verbs. The proximity to the two major parts of speech can be defined in terms of typical features of the two word classes. This has previously been demonstrated on the syntactic level in a number of morphosyntactically-oriented studies in linguistics, but this investigation shows that this is also the case on the textual, pragmatic level.

The study shows that the most productive morphological types are the ones which are closest to the verb, and the relative distance is also revealed by the logical process-result polysemy of the deverbal nouns. The process nominals are closer to the verb than the result nominals, as their semantics would indicate.

The process *-ing* nominals also exhibit argument structure revealed in the derived direct object construction on the phrase level with the argument transfer preposition *av* ('of'). The lack of determiners and modifiers with the nominals in the text and the frequent use of generic reference are further evidence that these nouns are non-typical nouns. These nouns are also quite common as exophoric reference and are thus important as indicators of the professional character of these texts.

This preliminary pilot investigation also shows, I think, that there is a need to study deverbal nominalizations further in LSP. My study has not touched the difficult question of terminology. As Dressler (1989) has pointed out, there are several questions of terminology to be solved.

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