

Valency of deverbal nouns in Czech

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Abstract

The present paper is an abstract of Doctoral Thesis *Valence deverbativních substantiv v češtině* successfully defended in October 2006, containing results obtained by the author during her doctoral study at the Faculty of Mathematics and Physics of the Charles University (MFF UK) in Prague from 1999 until 2006.

1. Introduction

The present study deals with valency properties of deverbal nouns in Czech. After an overview of Czech and foreign approaches to the valency of nouns and a summary of current knowledge concerning some special issues of valency of Czech deverbal nouns (Sections 2. and 3.1.), we present results consisting of our analysis of syntactically and semantically compact groups of deverbal nouns as well as theoretical conclusions following from the examined language material (Sections 3.2. and 4. to 7.).

We have focused our attention on Czech deverbal nouns that can be modified by a participant expressed by prepositionless dative. Such nouns were searched for in two Czech electronic corpora, Czech National Corpus (CNC) and Prague Dependency Treebank (PDT). The obtained occurrences were manually sorted and analysed and their valency behaviour is described within the theoretical framework of the Functional Generative Description (FGD).

2. Theoretical resources

2.1. FGD valency theory

Our approach to issues of valency of deverbal nouns is based on the theory of valency (especially valency of verbs) as developed in the framework of FGD (see Sgall, Hajičová and Panevová, 1986, and Panevová, 1980).

2.1.1. Verbal valency theory

In FGD, valency frames of verbs, stored in the lexicon, are reflected in the tectogrammatical representation of sentences. The following complementations (i.e. the individual dependency relations) are included in the set as they are able to fill individual slots of the valency frames of verbs:

(i) inner participants or arguments (they can be obligatory or optional): Actor (ACT), Patient (PAT), Addressee (ADDR), Effect (EFF), Origin (ORIG);

(ii) obligatory free modifications or adjuncts (especially those with the meaning of location (e.g. DIR3, LOC) and manner (MANN)).

2.1.2. Nominal valency theory

Within the concept of nominal valency in the framework of FGD (cf. Piřha, 1981, Piřha 1984 and Panevová, 2002), the meaning of the respective noun is the most important aspect. According to Kuryłowicz (1936), two basic types of the word-formative process, i.e. lexical derivation (LD) and syntactic derivation (SD), are distinguished (while in syntactic derivation only the syntactic function of

derived word differs from that of the verb, in lexical derivation not only the syntactic function, but also the lexical meaning of the derived word differs; see Kuryłowicz 1936). Therefore our description of valency of deverbal nouns is focused on three groups of nouns representing the most dominant stages of the process of substantivization, i.e. (i) nouns derived from verbs by syntactic derivation (i.e. nouns denoting an action), (ii) nouns on the boundary between SD and LD (the nouns do not denote an action anymore and gradually tend to a substantial meaning), and (iii) nouns obviously derived by lexical derivation (i.e. actor nouns, nouns denoting a result of an action, nouns denoting a place of an action and nouns denoting a tool).

While treating the valency frames assigned to deverbal nouns denoting an action (i.e. the group (i)), the same set of complementations as with verbs is used. Such nouns are expected to inherit all participants that are present in the valency frame of their source verbs. Forms of the participants reflect typical shifts in surface expressions of participants (e.g. Acc → Gen; see Section 3.1.; e.g. *vrátil knihu kamarádovi* → *vrácení knihy kamarádovi*, lit. '(He) returned the-book to-(his)-friend → returning of-the-book to-(his)-friend').

However, valency behaviour of deverbal nouns undergoing changes in their meaning (i.e. the nouns representing groups number (ii) and (iii)) is not so straightforward as with those denoting an action, and thus it requires special description. On the basis of experiences acquired by annotation of nominal valency in PDT (cf. Mikulová et al., 2005), main tendencies in valency behaviour of the nouns were formulated. The tendencies concerned the following phenomena:

(a) Meaning of a noun:

The meaning of a noun differs from the meaning of its source verb. Sometimes, the distinction can be unmistakable thanks to characteristic suffixes of the respective nouns (it concerns esp. nouns with an incorporated ACT, LOC or MANN, i.e. actor nouns (e.g. suffix *-tel*), nouns denoting a place of an action (e.g. suffix *-árna*) and nouns denoting a tool (e.g. suffix *-dlo*)). However, two basic types of Czech deverbal nouns possibly denoting an action (i.e. nouns derived from verbs by productive means, so-called verbální substantiva (VS), e.g. *honění* 'hunting', and nouns derived from verbs by non-productive means or by the zero suffix, so-called *dějová substantiva* (DS), e.g. *honba* 'hunt', *hon* 'hunt') have very often several meanings but their suffixes unfortunately do not help to identify the right one (in addition to an action, the nouns can denote esp. a result of an action, e.g. *pohoštění* 'refreshments', *stavba* 'building', a place, e.g. *stoupání* 'gradient', *vstup* 'entrance' and so on). Sometimes, it is not clear if the meaning has already changed (it is esp. the case of nouns derived from verbs by non-productive means, cf. very rare VS *prošení* 'asking' which definitely denotes an action, and its common DS counterpart *prosba* 'request' where the action meaning is not so certain). Moreover, a noun that obviously has different meanings (e.g. *vybavení*, i.e. 'furnishing' or 'furnishings', 'equipping' or 'equipment') can appear in context that does not provide sufficient information for decision which meaning of the noun we face (e.g. *Do vybavení pokoje investoval velkou částku*. 'He invested a large amount in furnishing the room' or 'He invested a large amount in furnishings (of the room).'). The process of recognition of the right meaning is very often complicated by deletions of participants of the noun (any complementation of a noun can be omitted on the surface layer).

(b) Valency complementation of a noun:

(i) Reduction of the number of slots in the valency frame of a noun:

The participants that are defined on the basis of their semantic properties rather than the syntactic ones (esp. ADDR and EFF) tend to disappear from the valency frame of the noun. In contrast, Patient is often kept. In valency frames of nouns with an incorporated participant (i.e. esp. ACT or PAT), the incorporated valency slot is missing.

(ii) Character of a valency complementation:

Nouns derived from verbs by lexical derivation can be modified by special valency complementations, called by Piřha (1984, p. 236) Partitive and Appurtenance. Partitive (or Material, MAT) is an inner

participant modifying nouns denoting a container, e.g. *skupina lidí*.MAT ‘a group of people’). Appurtenance (APP) is a free valency complementation, but with some nouns it can be obligatory (e.g. *Petrův*.APP *bratr* ‘Peter’s brother’), thus it belongs to their valency frame.

With some nouns derived by LD, a character of a valency slot changes from an inner participant to a free modification. This process was observed esp. in valency behaviour of nouns denoting a result of an action (artifacts; i.e. ORIG (inner participant) → ORIG (a free modification), e.g. *výrobek z kůže*.ORIG *od českých distributorů*.ORIG, lit. ‘a-product from leather from Czech distributors’, i.e. ‘a leather product from Czech distributors’, and Actor (ACT) → Author (AUTH), e.g. *Světová obchodní organizace*.ACT *ustanovila...* → *ustanovení Světové obchodní organizace*.AUTH ‘World Trade Organization agreed to regulate... → regulation of World Trade Organization’), and in valency frames of actor nouns (i.e. ADDR → APP, e.g. *dodává Petrovi*.ADDR → *Petrův*.APP/(ADDR) *dodavatel* ‘(he) supplies to Peter → Peter’s supplier’).

(iii) Form of a valency complementation:

Sometimes, the process of substantivization (i.e. the gradual change of the meaning from an action to a substance) may be accompanied also by new forms of a valency complementation of the noun. The forms do not undergo typical shifts in surface expressions of participants (e.g. Acc → Gen; see Section 3.1.). On the other hand, we claim that the new forms themselves cannot serve as a reason to regard the respective nouns only as lexical derivatives: the nouns may fill “gaps” in the language system and thus they may have the same role as the syntactic derivatives. Esp. the following groups single out: (A) particular DS which are considerably more frequent than their VS counterparts (cf. *účastnit se něčeho* ‘to take part in sth’, then regularly derived but rare VS inheriting the form of the participant from its source verb *účastnění se něčeho* ‘participating in sth’, and considerably more frequent DS with a new form of the participant *účast na něčem* ‘participation in sth’), and (B) nominal constructions where the new form of a participant of the noun is influenced by grammatical properties of the constructions (e.g. a tendency to avoid structural homonymy of adnominal genitive, e.g. *ministr*.ACT *varuje poslance*.ADDR or *poslanec*.ACT *varuje ministra*.ADDR → *varování ministra / poslance*.ACT/ADDR → *varování ministři / poslanci*.ADDR, lit. ‘a-cabinet-minister warns a-deputy’ or ‘a-deputy warns a-cabinet-minister’ → ‘warning of-a-cabinet-minister / of-a-deputy’ → ‘warning to-a-cabinet-minister / to-a-deputy’).

2.1.3. Valency dictionaries created in the framework of FGD

In the theoretical framework of FGD, two valency dictionaries were built up: PDT-vallex and VALLEX. PDT-vallex¹ captures valency frames of verbs, nouns, adjectives and adverbs – as they were recognised and assigned during tectogrammatical annotation of PDT (see Section 5.1.). Concerning nouns, PDT-vallex contains 3727 entries (special attention was paid to capturing valency properties of nouns derived from verbs by productive means, e.g. the noun *balení*: (i) *proces balení dárků*.PAT ‘a process of packing (of) gifts’, (ii) *dárkové balení vína*.MAT ‘a gift pack of wine’, (iii) *kniha v brožurkovém balení* ‘a book in a paperback packing’; and to nouns occurring as noun components of support verb constructions (see Section 4.), e.g. the noun *nabídka*: *učinit nabídku*, lit. ‘to make an-offer’; (i) *jejich*.ACT *nabídka architektům*.ADDR *postavit*.PAT *dům* ‘their offer to architects to build a house’, (ii) *mají širokou nabídku zákusků*.MAT ‘(they) have a wide offer of cakes’). VALLEX² contains just verbal lexical units, however, in comparison with the PDT-vallex data, the language information provided by VALLEX is richer (in addition to valency frames of all meanings of the given verb, it captures e.g. a relation of Control, and works towards an alternation-based lexical model).

¹ <http://ufal.mff.cuni.cz/pdt2.0/doc/pdt-guide/en/html/ch03.html#a-data-vallex>

² <http://ckl.mff.cuni.cz/zabokrsky/vallex/1.0/>

2.2. Other approaches to the issues of valency of nouns

Concerning foreign theories, issues of nominalizations as treated in Chomskyan generative grammar (cf. esp. Chomsky, 1972) and approaches leading to building up lexical databases should be mentioned (i.e. the FrameNet³ lexical database, related projects Nomlex⁴ and NomBank⁵, and finally Meaning-Text Theory and its Explanatory Combinatorial Dictionary of Modern Russian, cf. Mel'čuk and Žolkovskij, 1984).

Among Czech works important for our own research, there are papers of Panevová (1966), Jirsová (1966), Křížková (1968) and Prouzová (1969), and the only monograph dealing with valency of Czech nouns (in particular nouns derived from verbs by non-productive means, cf. Novotný, 1980). The thesis also reflects selected theoretical frameworks (i.e. a modified valency theory formulated by Karlík (cf. Karlík, 2000, Karlík, 2002, and Karlík, 2004), transformational generative grammar (Veselovská, 2001), and a lexicological approach applied by Čermák (cf. esp. Čermák, 1991, Čermák and Holub, 1991) and data of the only printed dictionary providing information not only about verbal valency but also about valency properties of Czech nouns and adjectives (i.e. *Slovník slovesných, substantivních a adjektivních vazeb a spojení*, Svozilová, Prouzová and Jirsová, 2005).

3. Forms of participants of deverbal nouns in relation to those of verbs

3.1. Typical shifts in surface expressions of participants

Within general description of nominal valency we paid attention esp. to forms of participants of nouns in relation to the forms of participants of their source verbs. Participants of nouns denoting an action (i.e. esp. nouns derived from verbs by productive means) undergo some regular rules. The rules were formulated esp. by Karlík (cf. Karlík and Nübler, 1998, pp. 107-111, and Grepl and Karlík, 1998, pp. 178-181) as follows⁶:

Rule (A): A valency slot with the form of nominative in an active or passive verbal construction changes within the process of nominalization to the valency slot with the form of genitive (e.g. *(náš) Petr píše* → *psaní (našeho) Petra* 'our Peter writes → writing of-(our)-Peter'; *Psi štěkají* → *štěkání // štěkot psů* 'Dogs bark → barking // bark of-dogs'; *Dopis je psán* → *psaní dopisu* 'The-letter is written → writing of-the-letter').

Rule (B): Forms of valency slots expressed in a verbal construction by a nominal group or an embedded clause, that are nor a subject with the form of nominative neither an object with the form of prepositionless accusative, do not change within the process of nominalization (e.g. *Žák naslouchá učiteli* → *naslouchání žáka učiteli* 'A pupil listens to the teacher → lit. listening of-a-pupil to-the-teacher'; *Touží po tom, aby vyhrál // vyhrát // po výhře* → *touha po tom, aby vyhrál // vyhrát // po výhře* 'He longs to win // for victory → longing / desire to win // for victory'; *Vnikl do pokoje* → *vniknutí do pokoje*, lit. 'He entered into the-room → entering into the-room', i.e. 'He entered the room → entering the room'). However, adverbs convert to adjectives (e.g. *Píše rychle* → *rychlé psaní*. '(He) writes quickly → quick writing').

Rule (C): Within the process of nominalization of a verbal construction where one valency slot has the form of nominative and the second one has the form of prepositionless accusative, just one of the

³ <http://framenet.icsi.berkeley.edu/>

⁴ <http://nlp.cs.nyu.edu/nomlex/index.html>

⁵ <http://nlp.cs.nyu.edu/meyers/NomBank.html>

⁶ The rules were freely translated from Czech by V. K.

participants can undergo the change of the form to prepositionless genitive. In Czech, a nominal construction with two participants expressed by prepositionless genitive is possible only in case when one of the participants has the form of genitive also in the source verbal construction (e.g. *Zbavil ženu starostí* → *zbavení ženy starostí*, lit. ‘(He) relieved the-women of-the-worries → relieving of-the-women of-the-worries’; according to rule (B), such a valency slot does not change its form). Karlík (2000, p. 183) distinguishes structural and non-structural cases (in a verbal construction, Nom and Acc are the structural ones), and claims that a nominal construction with two participants expressed by prepositionless genitive is possible only in case when one of the participants is a realisation of a structural case, and the second one a realisation of a non-structural case.

Rule (D): All valency slots of a source verbal construction become in the corresponding nominal construction just optional, it means they need not be expressed on surface at all.

In the present paper, the formal changes reflecting the above rules are called “typical shifts in surface expressions of participants”. As the genitive form can be a result of different shifts (i.e. Nom → Gen, Acc → Gen, and also “Gen → Gen”), in some nominal constructions a syntactic homonymy can occur (e.g. *střílení vojáků*, lit. ‘shooting of-solders’ (subject / object)).

3.2. Specific valency behaviour of nouns with a participant in prepositionless dative

When adnominal dative represents a valency complementation, it mostly has the meaning of Patient or Addressee. According to rule (B), in nominal constructions where the governing noun is modified by a participant in prepositionless dative, the dative form should correspond to adverbial dative in the source verbal construction. However, as it is shown in Section 6.2.2., adnominal dative can also be a result of some specific shifts. These specific shifts are exhibited esp. in valency frames of nouns on the boundary between syntactic and lexical derivation (but it also concerns nouns derived from verbs by productive means, e.g. *varování* ‘warning’). Moreover, in valency frames of some nouns with an incorporated participant, original adnominal dative becomes just the secondary form, while the primary one, i.e. genitive, does not obey rule (B). Such behaviour can be again qualified as a specific shift (see Section 6.2.3.).

4. Nouns as components of support verb constructions

Support verb constructions (SVCs) are combinations of a noun denoting an event or a state and a lexical verb. From the semantic point of view, the noun seems to be a part of a complex predicate rather than the object (or subject) of the verb, whatever the surface syntax may suggest. The meaning is concentrated in the noun component, whereas the semantic content of the verb is reduced or generalised. We have focused esp. on the valency properties of SVCs (i.e. valency of verbal as well as noun components, sharing of their participants and competition between the valency relation to the noun and to the support verb), and touched also issues of surface word order within SVCs. We employed conclusions of Čermák (1974) and Macháčková (1983) who dealt with SVCs in Czech, then examined treatment of English SVCs in FrameNet (cf. e.g. Fillmore, Johnson and Petrucci, 2003), and compared them with experience acquired during annotation of SVCs in the tectogrammatical tree structure of PDT (see Section 5.1.).

We concentrated on those SVCs where one of participants of the verbal component has the form of prepositionless accusative. Apart from this participant, the verbal components have also a subject in nominative, and a third valency complementation expressed by one of the following forms: prepositionless dative (e.g. *dát komu příkaz*, lit. ‘to give to-sb order’) or prepositional groups (i.e. *od+Gen* ‘from+Gen’, e.g. *dostat od koho příkaz*, lit. ‘to get from sb order’), *z+Gen* ‘from+Gen’, e.g. *nabýt z něčeho přesvědčení*, lit. ‘to gain conviction from sth’, i.e. ‘to come to believe that’, *na+Acc* ‘on+Acc’, e.g. *klást nároky na někoho*,

lit. ‘to put demands on sb’, and v+Loc ‘in+Loc’ or u+Gen ‘at+Gen’, e.g. *budit obdiv v kom / u koho*, lit. ‘to raise admiration in sb / at sb’). We studied valency behaviour of noun components of such SVCs, and observed that it can be influenced by valency properties of the verbal components. In particular, the nouns can, when they occur in the text without their support verbs, inherit a form of the third valency complementation of the verbs (it means that the form of the participant of the noun does not correspond to the form of the respective valency slot of its source verb, but to the form of the respective valency slot of the support verb). It concerns esp. the two following forms: (i) prepositionless dative (see also Section 6.2.2., e.g. *informovat někoho* ‘to inform sb’, but *dát / poskytnout někomu informaci*, lit. ‘to give / provide to-sb information’ → *informace někomu* ‘information to-sb’; *uznávat někoho* ‘to appreciate sb’, but *vyjádřit někomu uznání*, lit. ‘to express to-sb appreciation’ → *uznání někomu* ‘appreciation to-sb’; *podporovat někoho* ‘to support sb’, but *vyjádřit někomu podporu*, lit. ‘to express to-sb support’ → *podpora někomu* ‘support to-sb’; *otázat / dotázat se někoho* ‘to ask sb’, but *dát / položit někomu otázku / dotaz*, lit. ‘to give to-sb a question’ → *otázka / dotaz někomu* ‘a question to-sb’), and (ii) the prepositional group *od+Gen* ‘from+Gen’ (e.g. *ministr ujistil někoho, že* ‘secretary assured sb that’, *někdo dostal od ministra ujištění* ‘somebody got from secretary affirmation’ → *ujištění od ministra* ‘affirmation from the-secretary’).

5. Data sources

5.1. CNC and PDT

To obtain a sufficient language material providing occurrences of nouns modified by a participant in prepositionless dative, the following data sources have been used:

(i) A databank of linear texts, i.e. the Czech National Corpus⁷ (CNC; this is a representative corpus of contemporary written Czech, a part of which, called SYN2000, contains about 100 million words);

(ii) A dependency-based treebank, i.e. the Prague Dependency Treebank⁸ (PDT), which is a part of CNC annotated in several layers – morphological layer (2 million words), the shallow-parsed shape of PDT, so-called analytical layer (1,5 million words), and the so-called tectogrammatical layer capturing the underlying syntactic structures of sentences (0,8 million words).

Both used corpora are annotated (by morphological tags in the full CNC, by morphological tags, syntactic functions, functors, co-reference, and TFA in PDT). The linear corpus is very useful for searching for morphemic and lexical phenomena, including information about their frequency, but the dependency treebank is invaluable whenever one investigates syntactic relations in the sentence.

5.2. Methods of searching through CNC and PDT

5.2.1. Searching through CNC

Due to the high degree of “free” word order in Czech, many modifications of verbs or adjectives can occur as either preceding or following their governors (in contrast, most complementations of nouns occupy a position to the right of the given noun). Consequently, while searching for nouns modified in CNC by a participant in prepositionless dative, we may very often face a disagreement between the intention of the query and the obtained result (marked below by angled brackets). This concerns the case when the modification in dative following the examined noun is, in fact, a participant of another word occupying a position somewhere before or after the given noun (in the following examples, the other word, i.e. esp. a

⁷ <http://ucnk.ff.cuni.cz/>

⁸ <http://ufal.mff.cuni.cz/pdt2.0/>

verb, a noun or an adjective, is underlined: *zaklepal a předal <vzkaz muži>* ‘(he) knocked and handed the message to the man’; *o vyřízení <vzkazu manželce> požádal*, lit. ‘for delivering of-the message to-the-wife (he) asked’; ‘(he) asked for delivering of the message to the wife’; *Není Miloševičova <nabídka Moskvě> nesympatická?*, lit. ‘Is-not the Miloševič’s offer to-Moscow unpleasant?’; ‘Moscow finds the offer of Miloševič unpleasant, doesn’t it?’; we call this problem of the search “competition of complementations of two valency structures”). Thus, it is rather difficult to formulate a query about valency relations in the linear corpus.

For searching through CNC, the Graphic interface for the Corpus Query Processor (GCQP, cf. Koček, Kopřivová and Kučera, 2000), and the so-called Bonito⁹ were used. To find occurrences of concrete nouns modified by a participant in prepositionless dative the following query was formulated: ([lemma="the lemma of the examined noun"] [!(tag="[Z|R|V|J].*")]{0,4} [tag="N...[36].*"]). The query is the result of a compromise between our ambition to find as many correct examples as possible, and, at the same time, the effort to avoid examples which do not correspond to required constructions. Then all occurrences found were manually evaluated. We also tried to use general queries to collect a representative set of nouns possibly modified by a participant in dative (e.g. ([tag="N.*"] [tag="N...3.*"]), and ([tag="N.*"] [tag="[NAPC].*"] [tag="N...3.*"])), but such queries give a huge number of examples and it is almost impossible to evaluate them in a manual way.

5.2.2. Searching through PDT

PDT is smaller than CNC; however, when we intend to find all nouns which occur with a valency complementation in dative, it seems to be more advantageous to formulate a general query in a smaller corpus, because such a general query gives a result which is possible to be evaluated. Moreover, dependency structure of sentences in PDT, non-automatic lemmatization and morphological annotation entitle us to regard the results of searching through PDT as considerably more precise than those of CNC (in the dependency treebank all valency complementations depend on its governing noun, so the most often problem of the search in CNC, i.e. “competition of complementations of two valency structures”, should not occur at all in PDT).

While searching through PDT (we used its analytical layer), we applied the search tool called NetGraph¹⁰. We formulated the following general query: [tag=N*]([tag=N???3*]), and obtained 350 occurrences of about 131 different lemmas of nouns modified in PDT by a participant expressed by prepositionless dative.

6. Valency behaviour of found nouns on the basis of used corpora

6.1. Exploitation of PDT

First we manually analysed all found occurrences of nouns with a participant in prepositionless dative, and then we focused on (i) a syntactic and a semantic classification of the nouns, and (ii) a frequency evaluation of found occurrences.

6.1.1. Classification of examined nouns

Nouns found in PDT were divided into several groups reflecting their syntactic and semantic properties. The classification criteria applied to the nouns were as follows:

⁹ <http://ucnk.ff.cuni.cz/bonito/index.html>

¹⁰ <http://quest.ms.mff.cuni.cz/netgraph/>

(a) The type of the word-formative process (i.e. nouns derived from verbs by syntactic, or lexical derivation, e.g. nouns denoting an action vs. actor nouns);

(b) The origin of the dative form of the examined participant (i.e. the form of the corresponding participant of the source verb);

(c) The number and forms of other valency complementations of the nouns (special attention was paid to nouns with three participants which can potentially be expressed by prepositionless cases, cf. Section 6.2.1.);

(d) The semantic class of the nouns (e.g. nouns of giving vs. nouns of saying);

(e) The classification of nouns possibly denoting an action according to the productivity of means of their derivation (i.e. nouns derived from verbs by productive means (VS), e.g. *navrácení* ‘returning’, *odejmutí* ‘taking away’, vs. nouns derived from verbs by non-productive means or by the zero suffix (DS), e.g. *dodávka* ‘delivery’, *vzkaz* ‘message’).

6.1.2. Frequency evaluation of found occurrences

Reflecting the above classification, the evaluation concerned esp. frequencies of constructions containing particular types of the nouns. In particular, it covered:

(a) Numbers and frequencies of lemmas of the nouns:

Numbers of different lemmas of deverbal nouns with a dative complementation broadly outweigh the non-deverbal ones. Although nouns derived from verbs by productive means (i.e. VS) can be derived from almost all verbs, the number of different lemmas of VS is just slightly higher than that of DS (see Table 1 distinguishing also specific deverbal nouns, e.g. *dopis* ‘letter’). The frequencies of particular lemmas are even higher with DS.

	Deverbal nouns			Non-deverbal nouns	Total number
Number of nouns (lemmas) with a complementation in Dat	124 (94,7%)			7 (5,3%)	131 (100%)
	VS	DS	Specific deverbal nouns		
	62 (50%)	52 (41,9%)	10 (8,1%)		124 (100%)

Table 1

(b) Absolute and relative frequencies of occurrences of the nouns modified by a participant in dative:

Due to the fact that lemmas of DS are more frequent than those of VS, also absolute frequencies of occurrences of DS modified by a participant in prepositionless dative mostly rise above the VS ones. However, relative frequencies of the occurrences are higher with VS than with DS (see Table 2 illustrating four representatives of VS and DS, respectively, that were most frequently modified by a participant in dative). Thus, from this point of view, VS generally use the valency potential of their source verbs to a larger extent than DS.

Type of the noun	Lemma of the noun	Total frequency of the lemma	Absolute frequency of occurrences of the participant in Dat	Relative frequency of occurrences of the participant in Dat
VS	<i>porozumění</i> 'understanding'	45	9	20%
	<i>předání</i> 'handing over'	24	8	33,3%
	<i>navrácení</i> 'returning'	16	6	37,5%
	<i>poskytování</i> 'providing'	32	4	12,5%
DS	<i>pomoc</i> 'help'	234	38	16,2%
	<i>prodej</i> 'sale'	304	18	5,9%
	<i>pocta</i> 'honour'	23	12	52%
	<i>podpora</i> 'support'	267	10	3,7%

Table 2

(c) Percentage representation of nouns with the same valency frame (VF; see Table 3):

Most of the nouns were derived from verbs which can be modified by a valency complementation expressed by prepositionless dative as well (nouns derived from verbs with the simplified valency frame ACT(Nom) PAT(Acc) ADDR(Dat), e.g. *Petr.ACT prodal dům.PAT svému kamarádovi.ADDR* 'Peter sold the house to his friend', are the most numerous and the most frequent; it concerns esp. nouns of giving and nouns of saying). But searching through PDT has also revealed that there is a group of nouns exhibiting specific valency behaviour: In their valency frame there is a valency slot possibly expressed by prepositionless dative that, in valency frames of the respective source verbs, corresponds to the participant with the form of prepositionless accusative or genitive (e.g. *prosít někoho.Acc* 'to ask sb.Acc', but *prosba někomu.Dat*, lit. 'request to-sb.Dat'; *ptát se někoho.Gen*, lit. 'to ask of-sb.Gen', i.e. 'to ask sb', but *otázka někomu.Dat*, 'question to-sb.Dat'). This phenomenon can be described as a specific shift in the surface expressions of participants, i.e. Acc → Dat or Gen → Dat.

	Nouns with VF where Dat corresponds to adverbial Dat			Nouns with VF where Dat corresponds to adverbial Acc or Gen	Total number
	Nouns with VF potentially containing three prepositionless cases		Nouns with other VF		
	Nouns with VF ACT(Gen,poss,Instr) PAT(Gen,poss) ADDR(Dat)	Nouns with other VF			
Number of nouns (lemmas) with a participant in Dat	67 (58,8%)	6 (5,3%)	26 (22,8%)	15 (13,1%)	114 (100%)
Frequency of occurrences of the participant in Dat	145 (49,3%)	11 (3,7%)	96 (32,7%)	42 (14,3%)	294 (100%)

Table 3

6.2. Exploitation of CNC

In the next stage we selected several subsets of nouns found in PDT representing the most distinct and the most dominant subgroups of the above classification (see Section 6.1.1.) adding to them some nouns obtained by the general queries searching in CNC nouns followed by a noun in prepositionless dative, and then checked valency behaviour of each selected noun in CNC (a detailed manual evaluation was carried out for all found occurrences of 86 different lemmas of nouns modified by a participant in dative, but also the valency behaviour of some other nouns was checked to illustrate some related phenomena).

A detailed analysis of valency behaviour of nouns found in CNC not only confirmed the existence of specific shifts Acc → Dat and Gen → Dat in valency frames of the respective nouns (i.e. nouns modified by a participant in dative corresponding to adverbial accusative or genitive, see Section 6.2.2. below), but has also revealed further specific shifts in surface expressions of participants exhibited in valency frames of nouns derived from verbs by lexical derivation (this concerns specific shifts Dat → Gen / Adj_{poss}/Pron_{poss} observed especially in valency frames of actor nouns; see Section 6.2.3. below). Using the language material obtained from CNC, we have also examined valency properties of nouns that inherit the dative form of one participant from their source verbs (see Section 6.2.1.).

6.2.1. Nouns modified by a participant in dative corresponding to adverbial dative

Studying valency properties of nouns derived from verbs that can also be modified by a valency complementation expressed by prepositionless dative, we focused on two distinct semantic classes, i.e. nouns of giving and nouns of saying. According to the analysis of nouns found in PDT, nouns of giving and saying were classified as the most numerous and, from the semantic point of view, as the most compact groups of nouns with a participant in dative. As their source verbs, i.e. verbs of giving and saying, have nearly the same valency frame (it can be simplified as ACT(Nom) PAT(Acc) ADDR(Dat)), also the valency frames of derived nouns are expected to be very similar. Moreover, nominalised constructions with verbs of giving and saying potentially can occur with all three participants expressed by prepositionless cases (i.e. with the following combination of participants: ACT(Inst) PAT(Gen) ADDR(Dat)).

Concerning the fact that genitive is just one of secondary forms of expression of Patient with nouns of saying (the primary form is an embedded objective clause), we were not sure if it can modify all nouns of saying (cf. *Petr mi slíbil knihu.* → **Slib knihy však nedodržel.* ‘Peter promised me the book → However, he did not keep the promise of the book’). Thus we checked how Patient in prepositionless genitive is frequent with particular nouns of saying in CNC, and compared the results with frequencies of the corresponding verbal constructions, where Patient is expressed by prepositionless accusative. Following Daneš and Hlavsa (1987) and Grepl and Karlík (1998), we distinguished two basic ways of nominalization of this type of valency slot: the process of nominalization of the governing verb of the embedded clause (e.g. *Můj kamarád mi nabídl, že mohu pracovat v jeho firmě.* → *Můj kamarád mi nabídl práci v jeho firmě.* → *nabídka práce* ‘My friend offered me that I can work in his firm. → My friend offered me job in his firm. → offer of job’) and the process of its substitution (condensation) by the most important noun in the embedded clause (e.g. *Nabídl mi, abych si sedl na židli.* → *Nabídl mi židli.* → *nabídka židle* ‘(He) offered me to sit on the chair. → (He) offered me the chair. → offer of the chair’). It seems that different absolute and relative frequencies of found constructions reflect distinctions among particular subtypes of nouns (or verbs) of saying, however, this conclusion should be verified on the basis of richer language material.

In the next stage we dealt with the constructions where nouns of giving and saying are modified by ADDR in prepositionless dative. Comparing valency properties of nouns representing the two semantic classes, we also decided to observe differences in valency behaviour of two basic types of Czech deverbal

nouns possibly denoting an action (i.e. VS and DS). Thus we selected the same number of nouns derived from verbs of giving and saying by productive as well as non-productive means (i.e. 8 nominal lemmas representing nouns derived from verbs of giving by productive means, e.g. *věnování* ‘giving / donating’, and the same number of nouns derived from verbs of giving by non-productive means, e.g. *dodávka* ‘delivery’, and 11 representatives of both types of nouns derived from verbs of saying, e.g. *oznamování* ‘announcing / reporting’, and *návrh* ‘suggestion’). Detailed analysis of all occurrences of selected nouns modified in CNC by ADDR in dative concentrated on the following phenomena:

(i) absolute as well as relative frequencies of ADDR(Dat) modifying selected nouns, including frequencies of combinations of ADDR and other inner participants, e.g. *výdej majetku.PAT restituentům.ADDR*, lit. ‘issue of-a-property.PAT to-restituents.ADDR’;

(ii) forms of other inner participants and word order of particular slots;

(iii) support verb constructions containing the selected nouns.

It turned out that nouns representing the two semantic classes exhibit different valency behaviour, even though they potentially have a very similar valency frame. The differences are reflected esp. in the frequency and forms of expression of their Actor and in their typical position within SVCs: With nouns of giving, Actor almost does not occur, and when it is expressed it has the form of prepositionless instrumental; on the contrary, within constructions with nouns of saying Actor is considerable more frequent and its most typical forms are possessives and prepositionless genitive. While nouns of giving typically represent a nominalised verbal component of a SVC, e.g. *věnování pozornosti*, lit. ‘paying of-attention’, nouns of saying occupy the position of a noun component of a SVC, e.g. *podání návrhu*, lit. ‘giving of-suggestion’).

Nominal constructions with all three participants expressed by prepositionless cases were found only with nouns of giving (i.e. with VS and DS, respectively, e.g. VS *předání: předání výrobku.PAT výrobcem.ACT jeho pověřenému zástupci.ADDR*, lit. ‘handing-over of-the-product by-the-producer to-his accredited representative’, or DS *dodávka: dodávky tepla.PAT zákazníkům.ADDR touto společností.ACT*, lit. ‘supplies of-heat to-customers by-this company’; however, in CNC, such constructions are very rare). It seems that while nouns of giving can denote an action, nouns of saying tend to denote rather a result of the process of speaking.

Regarding comparison of valency behaviour of VS and DS representing the two semantic classes, we observed differences esp. in frequencies of particular combinations of their participants. As it has already ensued from PDT data, also data provided by CNC confirmed the fact that lemmas of DS of saying and giving are considerably more frequent than those of VS. Consequently, also absolute frequencies of particular combinations of participants of DS are mostly higher than those of VS. However, relative frequencies of the combinations of participants of VS representing the two semantic classes mostly rise above those of DS, thus also the CNC data support the hypothesis that VS generally use the valency potential of their source verbs to a larger extent than DS.

6.2.2. Nouns modified by a participant in dative corresponding to adverbial accusative or genitive

Up to now we have found 45 lemmas of nouns exhibiting specific valency behaviour that can be described as follows: the nouns can be modified by the complementation in prepositionless dative corresponding to the valency complementation of their source verbs expressed by prepositionless accusative or genitive (see also Prouzová, 1969, and Novotný, 1980, p. 116; thus we can talk about specific shifts in surface expressions of participants, i.e. Acc → Dat or Gen → Dat). The number of the nouns found in CNC was sufficient to identify several semantic classes of such nouns, i.e. the nouns of saying, e.g. *varování* ‘warning’, *otázka* ‘question’, the nouns denoting (e)valuation, e.g. *vyznamenání* ‘award’, and the nouns denoting “touch”, e.g. *polibek* ‘kiss’. Most of the nouns can also be a noun component of SVCs (e.g. *dát někomu otázku*, lit. ‘to give to-sb question’, *vyjádřit někomu uznání*, lit. ‘to express to-sb appreciation’, *dát*

pohlavek, lit. ‘to give slap’). Also a group of nouns denoting a result of an action can be distinguished (i.e. (e)valuation, e.g. *cena* ‘price’, a letter, e.g. *obsílka* ‘summons’, and an amount, e.g. *odškodnění* ‘compensation’), but for just a small number of lemmas of such nouns this group was studied marginally.

Nouns representing the most numerous group, i.e. nouns of saying, have in their valency frame three participants and that participant which can be expressed by prepositionless dative has the meaning of Addressee (denoting “by definition” an animate entity, e.g. *upozornění manažerům*, lit. ‘notice to-managers’, *informace uživatelům*, lit. ‘information to-users’). In valency frames of nouns denoting evaluation and touch, there are only two participants and the respective one has the meaning of Patient (which is mostly animate, e.g. *pocta básníkovi*, lit. ‘honour to-poet’, *políbení pikolíkovi*, lit. ‘kiss to-bellhop’, but with some nouns it can be animate as well as inanimate, e.g. *podpora prezidentovi*, lit. ‘support to-president’, but also *podpora demokracii*, lit. ‘support to-democracy’, and *úder poslanci*, lit. ‘blow to-deputy’, but also *úder morálce*, lit. ‘blow to-morality’).

Also the possibility of expression of the participant by prepositionless genitive (namely ADDR with nouns of saying and PAT with nouns denoting evaluation and touch) was verified in CNC. It has turned out that nouns derived from verbs of saying by non-productive means (e.g. *žádost* ‘request’) and some nouns denoting touch (e.g. *rána* ‘blow’) avoided that form. Other examined nouns allow for expression of the participant by both the forms (i.e. prepositionless dative as well as prepositionless genitive, e.g. *pochvala celému kabinetu*, lit. ‘praise to-whole cabinet’, *pochvala kravaty*, lit. ‘praise of-the-tie’). Nouns of saying also use prepositional groups as the form of the participant, e.g. *dotaz na vedení* ‘question to management’, *upozornění pro zákazníky* ‘notice for customers’.

Different factors supporting the specific shifts in surface expressions of participants, i.e. Acc → Dat or Gen → Dat, should be considered: the tendency to avoid the structural homonymy of the genitive form of the participant with nouns of saying (see also Section 2.1.2., paragraph (b)(iii)), and the influence of the third valency complementation of verbal components of SVCs on their noun components, esp. on nouns denoting evaluation and touch (cf. also Section 4.).

6.2.3. Adnominal dative modifying nouns with an incorporated role

We have also analysed valency behaviour of deverbal nouns with an incorporated role (esp. Actor, Patient, Location and Means), called also actor nouns, nouns denoting a result of an action, nouns denoting a place of an action and nouns denoting a tool. The examined nouns (except the nouns denoting a result of an action) were automatically generated by the derivative program (cf. Klímová, 2001) from about 450 verbs with the simplified valency frame ACT(Nom) PAT(Acc) ADDR(Dat), e.g. *dodávat* ‘to supply’. We have again concentrated on the valency slot with the meaning of Addressee. We have extracted frequencies of examples of particular nouns modified by ADDR from CNC, and we found out that this slot occurred only with nouns with an incorporated inner participant (ACT or PAT, e.g. *dodavatel* ‘supplier’, *dodávka* ‘delivery (the delivered goods)’), not with those nouns where a free modification was incorporated (i.e. LOC or MEANS, e.g. *podatelna* ‘registry’, *podavač* ‘feeder’).

With actor nouns, Addressee can be expressed by the original form of dative, which is very rare (e.g. *dodavatel zbraní Miloševičovi*, lit. ‘supplier of-weapons to-Miloševič’), but more often it has the genitive form and the alternating form of a possessive adjective or pronoun (e.g. *dodavatel Miloševiče*, lit. ‘supplier of-Miloševič’, and *Miloševičův / jeho dodavatel*, lit. ‘Miloševič’s / his supplier’). The second and the third forms (i.e. genitive and possessives) can be regarded as results of specific shifts in surface expressions of participants Dat → Gen / Adj_{poss}/Pron_{poss} (see also Šmilauer, 1966, p. 172). Actor nouns are obvious lexical derivatives, thus the meaning of the investigated modification expressed by the genitive form or a possessive can be interpreted also as a vague relation of Appurtenance (e.g. *poradce prezidenta.APP*, lit. ‘adviser of-President’, i.e. ‘adviser to President’, *prezidentův.APP poradce* ‘President’s adviser’).

7. Further results of the dissertation

In addition to the detailed analysis of three studied groups of nouns, also the following conclusions should be considered as results of the dissertation:

7.1. Overview of specific shifts in surface expressions of participants

On the basis of examined corpus-based material and remarks scattered in the works of other authors the dissertation gives an overview of specific shifts in surface expressions of participants:

(i) Nouns on the boundary between syntactic and lexical derivation

(ia) Specific shifts connected with strict constraints for occupying more than one slot expressed by prepositionless genitive in a nominal construction (cf. rule (C) in Section 3.1.):

- Nom → *od*+Gen ‘from+Gen’ (e.g. *Čeští zaměstnavatelé.Nom nabízejí práci.Acc → nabídka práce.Gen *českých zaměstnavatelů.Gen > od českých zaměstnavatelů* ‘Czech employers offer jobs → lit. offer of-job of-Czech employers > from Czech employers’);

- Acc → a prepositional group (e.g. *Diváci.Nom obdivovali herce.Acc → obdiv diváků.Gen *herců.Gen > k hercům*, lit. ‘An-audience admired actors → admiration of-an-audience *of-actors > to actors’; cf. Karlík, 2000, p. 189);

- Acc → Dat (e.g. *Řidič upozornil všechny cestující.Acc → upozornění řidiče.Gen *všech cestujících.Gen > všem cestujícím.Dat*, lit. ‘The-driver warned all passengers → warning / notice of-the-driver *of-all passengers > to-all passengers, i.e. driver’s warning / notice to all passengers’; cf. Prouzová, 1969, and Section 6.2.2.).

(ib) Other specific shifts:

- Gen / Dat → a prepositional group (e.g. *obávat se koho.Gen → obavy z koho*, lit. ‘to be afraid of-sb → fear from sb’; *křivdit komu.Dat → křivda na kom*, lit. ‘to wrong to-sb → wrong at sb’; cf. Jirsová, 1966, p. 76, and Novotný, 1980, p. 93ff);

- Instr → Gen (e.g. *kývl hlavou.Instr → naznačil kývnutím hlavy.Gen*, lit. ‘(he) nodded by-(his)-head → (he) hinted by-a-nod of-(his)-head’; cf. Křížková, 1968, p. 125);

- Gen → Dat (e.g. *Jan se otázel svého kamaráda.Gen → Janova otázka kamarádovi.Dat*, lit. ‘John asked of-his friend’, i.e. ‘John asked his friend’ → lit. ‘John’s question to-(his)-friend’; cf. Novotný, 1980, p. 116, and Section 6.2.2.).

(ii) Nouns with an incorporated participant

- Dat → Gen / *Adj_{poss}*/*Pron_{poss}* (e.g. *dluží bance.Dat → dlužník banky.Gen*, lit. ‘He owes to-the-bank → debtor of-the-bank’; *(po)radí prezidentovi.Dat → poradce prezidenta.Gen / prezidentův.Adj_{poss} poradce / jeho.Pron_{poss} poradce*, lit. ‘(He) advises to-President → adviser of-President / President’s adviser / his adviser’, cf. Šmilauer, 1966, p. 172, and Section 6.2.3.);

- a prepositional group → Gen / *Adj_{poss}*/*Pron_{poss}* (e.g. *Spolupracuje s Petrem → spolupracovník Petra.Gen / Petrův.Adj_{poss} spolupracovník / jeho.Pron_{poss} spolupracovník*, lit. ‘(He) collaborates with Peter → collaborator of-Peter / Peter’s collaborator / his collaborator’).

7.2. General tendencies in filling up particular valency positions of deverbal nouns

Regarding the frequency of typical and specific shifts in surface expressions of participants (see Sections 3.1. and 7.1.), primary as well as secondary general tendencies (or principles) have been formulated that are important for the filling up of particular positions in valency frames of deverbal nouns. Primary general principles concern typical shifts in the surface expressions of participants and describe the valency

behaviour of most Czech deverbal nouns, secondary general principles involve various specific shifts in surface expressions of participants and cover valency properties of just a limited subset of Czech deverbal nouns. However, for an exhaustive description of the valency behaviour of Czech deverbal nouns it is necessary to take into account not only the primary general principles but also the secondary ones. It is also important to realize that the dative form of a participant of a noun can, under certain conditions, compete with other forms of surface expression, i.e., in addition to various prepositional groups, surprisingly also with prepositionless genitive.

7.3. Algorithmic transduction of valency frames

The dissertation resumes previous attempts to solve the problem of an algorithmic transduction of valency frames of verbs to the valency frames of derived nouns. It also specifies questionable phenomena that should be taken into consideration while building such an algorithm in future. In particular, it claims that:

(i) It is necessary to divide such a task into several steps (branches) to be able to capture specific valency properties of particular types of nouns (i.e. esp. nouns derived from verbs by syntactic or lexical derivation, and nouns on the boundary between them).

(ii) It is very difficult to reflect, in an automatic way, specific shifts in surface expressions of participants (see Section 7.1.; e.g. it is problematic to predict forms of prepositional groups). For treatment of specific shifts Gen / Acc → Dat the following (probably incomplete) list of verbal valency frames was proposed where the shifts apply: ACT(Nom) PAT(its primary form is an embedded objective clause) ADDR(Acc/Gen); ACT(Nom) PAT(Acc) ^{yp}CAUS(za+Acc ‘for+Acc’); ACT(Nom) PAT(Acc) ^{yp}MEANS(Instr).

(iii) Although some forms of valency complementations reflecting the typical shifts (see Section 3.1.) are theoretically possible, their real usage is influenced by various limits, e.g. an “overload” of a nominal construction (e.g. very rare occurrences of nominal constructions with Actor expressed by prepositionless instrumental) or stylistic reasons (e.g. not clear acceptability of constructions where possessive adjectives have the meaning of Patient, e.g. *?Mikulášovo.PAT očekávání (dětmi.ACT)*, lit. ‘Nicholas’.PAT expecting (by children.ACT)’, i.e. ‘expecting of Nicholas by children’).

We have also proposed rules (components of “algorithms”) rendering the most typical combinations of surface expressions of participants in constructions with nouns of giving and nouns of saying.

7.4. Applicability of the results to dictionary build-up

Results of the present dissertation can also be exploited in building up valency dictionaries of Czech nouns, esp. during the future extension of existing valency dictionaries based on the valency theory of the Functional Generative Description, i.e. PDT-vallex and VALLEX, and consequently, within future annotation of valency properties of nouns in Czech corpora.

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