



Reflexives as Part of Verb Lexemes in the VALLEX Lexicon

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Abstract

Reflexivity represents one of the core research tasks in current linguistics. As the use of reflexives, encoding a variety of meanings, typically brings about changes in verb valency, the description of reflexivity is highly relevant – among others – also for valency oriented studies. In this paper, we address the reflexive in Czech categorized as a derivational morpheme (e.g., *zlomit^{Pf}* ‘to break something’ → *zlomit se^{Pf}* ‘to break; to crack’), with the focus on valency behavior of reflexive verbs as represented in the valency lexicon of Czech verbs *VALLEX*.

In the data component of the lexicon, reflexive verbs, i.e., verbs with reflexive lexemes, are captured in separate lexicon entries, represented by respective verb lemma(s) containing the free reflexive morpheme *se* or *si*. In *VALLEX*, there are 922 lexical entries for reflexive verbs described in 1 545 lexical units represented by 1 525 verb lemmas (this number covers almost one quarter of lexical units and one third of verb lemmas in the lexicon). Reflexive verbs can be divided into two groups: into those without any non-reflexive counterpart (*reflexiva tantum*, 208 lexical units represented by 177 verb lemmas) and into those for which a non-reflexive base verb can be identified (*derived reflexive verbs*, 1 337 lexical units represented by 1 348 verb lemmas). Those derived reflexive verbs that are directly related to their non-reflexive base verbs are classified into seven types on the ground of their relation to the non-reflexive counterparts, captured in the data component of the lexicon by the value of the attribute *reflexverb*.

Further, the relation of derived reflexive verbs and their respective non-reflexive counterparts is described by formal rules comprised in the grammar component of the lexicon (19 rules in total), which provide the information on changes in the mapping of semantic participants onto valency complementations.

1. Introduction

The importance of the study of reflexivity is widely acknowledged in contemporary linguistics (see esp. Genuišienė, 1987; Kemmer, 1993; Frajzyngier and Walker, 2000; König and Gast, 2008). Reflexivity – in a broad sense – covers all uses of verbs (sporadically nouns and adjectives) marked by a reflexive. As the reflexive, we mean “an element in the verb (affix, ending, etc.) or its environment (particle, pronoun etc.) which has (or once had) a reflexive meaning (of coreference of two semantic roles) as its only or one of many function” (Genuišienė, 1987, p. 25). As the reflexive is involved in a variety of meanings, which are typically associated with valency changes, their description belongs to primary tasks of valency oriented research. In Czech, two functions of the reflexive are distinguished: (i) the function of the personal pronoun and (ii) the function of a free morpheme that is seen (a) as part of the reflexive verb form or (b) as part of reflexive verb lexemes (see esp. Kopečný, 1954; Komárek et al., 1986; Panevová, 2008). From this follows that while the reflexive of the type (iia) is categorized as an inflectional morpheme, the reflexive of the type (iib) is treated as a derivational morpheme. Here we primarily focus on the valency changes brought about by the reflexive categorized as the derivational morpheme. We describe these changes as captured in the valency lexicon of Czech verbs *VALLEX* (esp. Lopatková et al., 2016).¹

The paper is structured as follows. The background valency theory of the *VALLEX* lexicon is described in Section 2. The lexicographic representation of the reflexive is outlined in Section 3, with an emphasis on the position of different functions of the reflexive in the whole architecture of the *VALLEX* lexicon. Different types of verbs with reflexive lexemes (henceforth *reflexive verbs*) were identified in the data; their treatment in the lexicon is then introduced. As our main contribution in this paper, we concentrate on a classification of derived reflexive verbs (Section 4). In this classification, we adopt a taxonomic approach similar to the one proposed by Genuišienė (1987) and for Czech outlined by Pergler (2020). We categorize different types of derived reflexive verbs on the basis of changes in their valency structure compared to their non-reflexive base verbs. It should be emphasized at the very beginning that these verbs “constitute a semantic continuum and discrete ... types distinguished are only points along this continuum” (Genuišienė, 1987, p. 59). We thus delimit individual types of derived reflexive verbs as focal points on this continuum.

¹ The changes in the valency structure of verbs associated with the reflexive pronoun, including syntactic reflexivity and reciprocity, and those brought about by the reflexive verb form, comprising deagentive and dispositional diathesis, have been thoroughly described by Kettnerová et al. (2021) and Lopatková et al. (2016), respectively.

2. Basic Concepts of the VALLEX Lexicon

2.1. Valency Theory in VALLEX

The VALLEX lexicon makes use of the valency theory formulated within the Functional Generative Description as its theoretical background (see esp. Sgall et al., 1986; Panevová, 1974–75, 1994; Panevová et al., 2014). Valency is primarily related to the so-called tectogrammatical layer in this approach, roughly corresponding to the deep syntactic layer, with a specific impact on the surface syntactic layer and the morphemic layer as well. A predicate (typically verbs, but also some nouns, adjectives and adverbs in their individual senses), is characterized by a certain set of *valency complementations*. Two types of valency complementations are distinguished: actants and free modifications.²

Actants, roughly corresponding to arguments of other syntactic theories, modify only restricted groups of predicates that can be listed and they occur in a single predicate only once. On the surface syntactic layer, they are expressed as the subject or as (direct and indirect) objects. Five actants are distinguished for verbs: Actor (**ACT**), Addressee (**ADDR**), Patient (**PAT**), Origin (**ORIG**) and Effect (**EFF**). *Free modifications*, roughly corresponding to adjuncts of other theories, can modify any predicate and they can appear in a single predicate more than once. On the surface, they are realized as adverbials. Unlike actants, they are distinguished primarily on a semantic basis. Both actants and free modifications can be either obligatory or optional on the tectogrammatical layer; this distinction is determined by the so-called dialogue test (Panevová, 1974–75).

Actants (be they obligatory or optional) and obligatory free modifications constitute a *valency frame* of a predicate. The valency frame is a set of valency positions, each standing for one valency complementation, labeled by a functor (i.e., a label representing the relation of the valency complementation to its governing predicate), and by the information on its obligatoriness. For actants, their morphemic forms are provided as well, determining their surface realization; morphemic forms of free modifications follow from their functors.

For semantic characterization of a verb and its valency complementations, the concept of a situation has appeared to be beneficial (see esp. Mel'čuk, 2004). Each verb in a given sense denotes a situation with a certain set of participants; their number, types (characterized by semantic roles)³ and relations then characterize the verb in a unique way. Any changes in this set typically indicate a change of the situation, hence a different sense of the verb. Each participant of the verb typically corresponds to one of its valency complementation.

² Plus quasi-actants, having some properties in common with actants while others with free modifications; quasi-actants thus represent the borderline category.

³ Semantic roles – despite some criticisms, see a summary in Levin and Rappaport Hovav (2005) – have proved to be a useful tool in the description of various valency phenomena.

2.2. Structure of the VALLEX lexicon

The central concept of the VALLEX lexicon⁴ is a *lexeme*, an abstract two-fold unit associating all verb forms with their *lexical units*, i.e., with their individual senses. Unlike traditional dictionaries, VALLEX treats perfective and imperfective aspectual counterparts within a single lexeme since they typically share their valency properties. Each lexeme is captured as a separate lexicon entry, represented by verb lemma(s). In the lexicon entry, individual lexical units are assigned their valency frames, examples and a gloss. Further, each lexical unit can be provided with additional syntactic and semantic information.

In VALLEX, the emphasis is put on analyzing the full spectrum of valency-related phenomena, including the syntactic structures that affect the surface expression of valency. For the description of changes in valency structure of verbs brought about by diatheses, syntactic reflexivity and reciprocity, referred to as *grammaticalized alternations*, the lexicon has been divided into two parts: a *data component* and a *grammar component* (see esp. Lopatková et al., 2016). The data component stores valency frames capturing the active, non-reflexive and non-reciprocal uses of verbs, while the grammar component stores formal rules making it possible to derive valency frames underlying passive, reflexive and reciprocal constructions. Besides these formal rules, the grammar component contains rules associating pairs of lexical units of verbs characterized by systemic shifts in their meaning, referred to as *lexicalized alternations*.

3. Reflexives in the Structure of VALLEX

In Czech, the reflexive has the clitic forms *se*, *si* and the full forms *sebe*, *sobě*, *sebou*. Whereas the full forms are undoubtedly classified as the reflexive personal pronoun, the status of the clitic forms is questionable. The clitic forms of the reflexive can be employed either as the reflexive personal pronoun⁵ or as a free morpheme representing either part of the reflexive verb form or part of reflexive verb lexemes (see esp. Kopečný, 1954; Komárek et al., 1986; Panevová, 2001; Panevová, 2008; similarly Štícha et al., 2021).

Here we only briefly (and just for completeness) mention the reflexive personal pronoun and the reflexive classified as part of the reflexive verb form and their treat-

⁴ <https://ufal.mff.cuni.cz/vallex>

⁵ Let us stress, however, that the pronominal status of the clitic reflexive is not accepted without reservation. For example, Oliva (2000, 2001), Karlík (1999) and Veselý (2018) assign the pronominal function only to the full forms of the reflexive; esp. changes in agreement of predicative complements are taken by these scholars as strong evidence against the pronominal status of the reflexive *se*.

In contrast, some scholars argue that it cannot be disregarded that the clitic and the full forms of the reflexive are functionally equivalent in some constructions, and the choice of their form is determined by topic-focus articulation (see esp. Komárek, 2001; Fried, 2004, 2007; Panevová, 2001). In VALLEX, this position, making it possible to treat functionally equivalent uses of the reflexive in the same manner, has been adopted.

ment in VALLEX, as these types have been already thoroughly described (see the references in Sections 3.1 and 3.2.1). We primarily focus on the clitic forms of the reflexive *se*, *si* that are classified as part of reflexive verb lexemes and their representation in VALLEX (Sections 3.2.2 and 4).

3.1. Reflexive Personal Pronoun

In Czech, the reflexive personal pronoun, filling one valency position of a verb, encodes referential identity of some of valency complementations of the verb in conventionalized constructions expressing either *reflexivity* or *reciprocity*. In VALLEX, these constructions are referred to as *syntactic reflexivity* and *reciprocity*, respectively (esp. Kettnerová et al., 2021). See the reflexive construction in example (1-a) and the reciprocal one in example (1-b). In this case, the clitic forms of the reflexive *se*, *si* are substitutable by the full forms *sebe*, *sobě*, respectively, if topic-focus articulation is changed.

- (1) a. *Generál Peckem se považoval za estéta a intelektuála.*⁶
 ‘General Peckem considered himself an esthete and an intellectual.’
 b. *Oba se pak vzájemně považují za lháře ...*
 ‘They then both view each other as a liar ...’

Reflexive and reciprocal constructions are derived by the syntactic operation of reflexivization and reciprocalization, respectively. In the VALLEX lexicon, syntactic reciprocity and reflexivity are treated as grammaticalized alternations, the description of which relies on both the data and the grammar component. As it was thoroughly discussed by Kettnerová et al. (2021), we leave it aside here.

3.2. Reflexive Free Morpheme

The clitic forms of the reflexive can also have the function of a free morpheme, which is distinguished into that representing part of the reflexive verb form (only the clitic reflexive *se*, Section 3.2.1) and into that standing for part of verb lexemes (the clitic reflexive *se* and *si*, Section 3.2.2); as such, they are not substitutable by the full forms.

3.2.1. Reflexive Verb Form

The clitic reflexive *se* combines with the 3rd person of indicative or conditional of a verb, constituting together the reflexive verb form. This verb form is characteristic of deagentive and dispositional constructions, see examples (2-a) and (2-b), respectively, traditionally subsumed under diatheses (see esp. Panevová et al., 2014).

⁶ Unless explicitly stated differently, examples are extracted from the Czech National Corpus, subcorpus SYNv10 (available at <https://www.korpus.cz/>).

- (2) a. *Druhý poločas se dohrával takřka z povinnosti, ...*
 'The second half-time was played out almost out of duty, ...'
 b. *Zpěvákovi se chata špatně prodávala ...*
 'The singer's cottage sold poorly ...'

Similarly to syntactic reflexivity and reciprocity (see Section 3.1), deagentive and dispositional diatheses are represented in VALLEX as two types of grammaticalized alternations. The information on these diatheses is then divided between the data and the grammar component. As the representation of different types of diatheses (including formal rules describing changes in valency structure of verbs) has been thoroughly discussed in Lopatková et al. (2016), we leave them aside here.

3.2.2. Reflexive Verb Lexemes

The clitic forms of the reflexive *se* or *si* can be an obligatory or optional part of verb lexemes as well. Henceforth, we refer to verbs with reflexive lexemes for simplicity as *reflexive verbs* here. If the reflexive is an *obligatory part of a verb lexeme*, the reflexive *se* or *si* combines with all forms (including the infinitive one) and with all lexical units of this verb,⁷ see, e.g., the two lexical units of the verb *rozplývat se impf – rozplynout se pf* 'to dissolve; to gush' in examples (3-a) and (3-b) and the lexical unit of the verb *vážit si impf* 'to appreciate' in example (3-c). If the reflexive is an *optional part of a verb lexeme*, some lexical units of the verb can be marked or unmarked by the reflexive and the reflexive does not bring about any syntactic and semantic change, see example (3-d) with the verb *naříkat, (si) impf* 'to complain' and example (3-e) with the verb *šplhat (se) impf* 'to rise'.

- (3) a. *Nepříjemné pocity se rozplývají. /*
 **Nepříjemné pocity rozplývají.* [modified]
 'Unpleasant feelings dissolve.'
 b. *Rozplývejte se nad krásami Prahy a budete mít pokoj. /*
 **Rozplývejte nad krásami Prahy a budete mít pokoj.* [modified]
 'Gush about the beauties of Prague and you will have peace.'
 c. *Svobody si váží ten, kdo zažil nesvobodu. /*
 **Svobody váží ten, kdo zažil nesvobodu.* [modified]
 'Freedom is appreciated by those who have experienced unfreedom.'
 d. *Nebudu si však naříkat na život. [modified] /*
Nebudu však naříkat na život.
 'But I will not complain about life.'

⁷ The only rare exceptions are represented by the passive participle of reflexive verbs, if available, it does not have to be marked by the reflexive, compare, e.g., *Rodiče se o děti dobře postarali.* 'The parents took good care of the children.' and *O děti bylo dobře postaráno.* 'The children were well taken care of.'

Reflexive	Lexical units	Lemmas	Lexemes
<i>se</i>	1 363	1 311	785
<i>si</i>	182	214	137
(<i>se</i>)	37	41	25
(<i>si</i>)	115	137	74
<i>se</i> or <i>si</i>	1 545	1 525	922
(<i>se</i>) or (<i>si</i>)	152	176	97
all ⁸	1 697	1 701	1 019

Table 1. The basic statistics on reflexive verbs in the VALLEX lexicon. The parentheses indicate optionality of the reflexive.

- e. *Rtuť teploměru se prudce šplhala vzhůru.* /
Rtuť teploměru prudce šplhala vzhůru. [modified]
 ‘The mercury in the thermometer was rising up sharply.’

As to the representation of reflexive verbs in the VALLEX lexicon, those reflexive verbs whose lexemes are obligatorily marked by the reflexive constitute a separate lexicon entry, represented by respective verb lemma(s) containing the reflexive as the headword of the entry, as e.g., *bát se*^{impf} ‘to be afraid of; to fear’, *přichystat se*^{pf} ‘to make ready; to prepare’, *libovat si*^{impf} ‘to enjoy; to be pleased’, *děkovat si*^{impf} ‘to thank each other’. In contrast, the verbs whose verb lexemes are only optionally marked by the reflexive are comprised in the same lexicon entry as their non-reflexive counterparts and the respective reflexive in their lemma headwords is recorded in parentheses; e.g., the verbs *spoléhat*^{impf} – *spolehnout*^{pf} and *spoléhat se*^{impf} – *spolehnout se*^{pf} ‘to rely’ are subsumed under the same lexical entry headed by the lemmas *spoléhat (se)*^{impf} – *spolehnout (se)*^{pf}.

VALLEX contains 1 697 lexical units of reflexive verbs that are represented by 1 701 lemmas forming 1 019 lexemes. This number covers almost 25% of all the lexical units and more than 36% of all the verb lemmas comprised in the lexicon. Table 1 breaks down these counts by the form of the reflexive. We can see that the verbs with lemmas that are obligatorily marked by the reflexive *se* heavily outweigh those with lemmas obligatorily marked by the reflexive *si*. However, in the case of the verbs in which the reflexive is an optional part of verb lexemes, the situation is reversed: the verbs with the reflexive *si* prevail over those with the reflexive *se*.

⁸ Note that the counts in the “Lemmas” and “Lexemes” columns do not sum up to the numbers in the “all” row as in two cases, a single verb is marked by both the optional *se* and the optional *si* (and thus it is counted twice, both in the (*se*) and in the (*si*) row), namely the verb *počínat (se)*^{impf} ‘to begin’, *počít*

Reflexive	Tantum			Derived		
	LUs	Lemmas	Lexemes	LUs	Lemmas	Lexemes
<i>se</i>	188	157	107	1 175	1 154	678
<i>si</i>	20	20	12	162	194	125
all	208	177	119	1 337	1 348	803

Table 2. The basic statistics on reflexiva tantum and derived reflexive verbs in the VALLEX lexicon (LUs stands for “Lexical units”).

Reflexive verbs whose lexemes are obligatorily marked by the reflexive split into two main subtypes: into those for which a non-reflexive counterpart can be identified (henceforth called *derived reflexive verbs*) and into those for which no non-reflexive counterpart can be found (*reflexiva tantum*). The former type is more common than the latter: 1 337 lexical units of derived reflexive verbs represented by 1 348 reflexive lemmas in 803 lexemes vs. 208 lexical units of reflexiva tantum represented by 177 reflexive lemmas in 119 lexemes. Table 2 provides the basic statistics on the distribution of the reflexive *se* and *si* in these verbs.

Reflexiva Tantum

Reflexiva tantum, by some authors also called deponents (see esp. Kemmer, 1993; Haspelmath, 2007) or inherently reflexive verbs (Karlík et al., 2016), can completely lack a non-reflexive counterpart (e.g., *narodit se^{pf}* ‘to be born’ but **narodit, potesknout si^{pf}* ‘to complain’ but **postesknout*; the so-called strong deponents in Haspelmath, 2007) or they can have a seemingly non-reflexive counterpart to which they are not, however, semantically and/or syntactically related from a synchronic point of view (e.g., *hádat se^{impf}* ‘to quarrel’ but *hádat^{impf}* ‘to guess’, *hodit se^{pf}* ‘to match’ but *hodit^{pf}* ‘to throw’; the so-called weak deponents, *ibid.*).

In the VALLEX lexicon, reflexiva tantum are represented by their respective verb lemmas containing the reflexive *se* or *si*. Those of them that have seemingly non-reflexive counterparts are distinguished from the respective non-reflexive verbs by Roman numerals, indicating that these reflexive and non-reflexive verbs are homographs, e.g., *hádat_{II} se^{impf}* ‘to quarrel’ but *hádat_I^{impf}* ‘to guess’. Further, each lexical unit of reflexiva tantum is assigned the attribute *reflexverb* with the value *tantum*. For their statistics see Table 2.

(*si*)^{pf} ‘to do’ (belonging to the same lexeme as they are semantically related in Czech) and the verb *rozmyšlet (si)^{impf}, rozmyšlet (se)^{impf}* ‘to consider; to contemplate’.

Derived Reflexive Verbs

Derived reflexive verbs are derivationally related – from a synchronic perspective – to non-reflexive verbs. The word-formation process deriving these reflexive verbs from the base non-reflexive ones is referred to as reflexivization (see esp. Genuišienė, 1987 and for Czech Petr et al., 1986). Some of lexical units of a derived reflexive verb are then typically *directly semantically and/or syntactically related* to a lexical unit of its non-reflexive counterpart (called reversible reflexives by Genuišienė, 1987). Their mutual relation can be described in terms of regular changes in their semantic and/or syntactic features. For example, the derived reflexive verb *třást se^{impf}* ‘to shiver’ in example (4-b) has its base verb in the non-reflexive verb *třást^{impf}* ‘to shake’, see example (4-a).

The lexical units of derived reflexive verbs that are directly semantically and/or syntactically related to their non-reflexive base verbs can, however, undergo subsequent semantic and syntactic shifts, resulting in separate lexical units. The resulting lexical units then have only an *indirect semantic and syntactic relation* to their non-reflexive counterparts (these are referred to as non-reversible reflexives by Genuišienė, 1987). See examples (4-c) and (4-d) with two different lexical units of the derived reflexive verb *třást se^{impf}* with the meaning ‘to be eager’ and ‘to worry about; to be afraid of’, respectively.

- (4) a. *Zima mnou třásla, až mi začaly cvakat zuby.*
 ‘The cold was shaking me so much that my teeth began to chatter.’
- b. *Třásl jsem se zimou.*
 ‘I was shivering with cold.’
- c. ... *ale o to více se třeseme na novinky ze světa celebrit.*
 ‘... but we are all the more keen on the news from the world of celebrities.’
- d. *Na 40 turistů se třásl o život v kabině lanovky nedaleko Lago Maggiore ...*
 ‘About 40 tourists were worried about their life in the cabin of the cable car near Lake Maggiore ...’

Derived reflexive verbs are captured in the VALLEX lexicon as separate lexemes in their own lexicon entries represented by respective verb lemmas (with the reflexive *se* or *si* being their part). Each lexical unit of a derived reflexive verb is assigned the attribute *reflexverb* with the value *derived*, with a suffix indicating whether the lexical unit of the reflexive verb is directly or indirectly related to a particular lexical unit of the base verb. When directly related, the suffix identifies a type of the reflexive verb, as addressed in Section 4, and the attribute provides also a reference to the respective lexical unit of the base verb. Those lexical units that have only the indirect relation to their non-reflexive base verbs are indicated by the suffix *nonspecific*, without any reference to a lexical unit of the non-reflexive counterpart. Basic statistics on derived reflexive verbs contained in the data of the lexicon show that the verbs that

Reflexive	Directly Related			Indirectly Related		
	LUs	Lemmas	Lexemes	LUs	Lemmas	Lexemes
<i>se</i>	693	902	521	482	500	318
<i>si</i>	52	73	48	110	126	80
all ⁹	745	975	569	592	626	398

Table 3. The basic statistics on derived reflexive verbs in the VALLEX lexicon (LUs stands for “Lexical units”).

are directly related to their non-reflexive base verbs slightly outweigh those that are indirectly related, see Table 3.

Further, the grammar component of the VALLEX lexicon contains a set of formal rules (19 rules in total) specifying the relation of the derived reflexive verbs that are directly related to their non-reflexive base verbs and their respective non-reflexive counterparts in terms of changes in the mapping of semantic participants onto valency complementations, as discussed in Section 4.

4. Types of Derived Reflexive Verbs in VALLEX

In the case of the derived reflexive verbs that are directly semantically and/or syntactically related to their non-reflexive base verbs, this relation can be described in terms of systemic differences in semantic and/or syntactic properties of these verb pairs. Four types of changes can be identified:

- (i) Systemic changes in a situation denoted by a reflexive verb which result in the reduction of the number of semantic participants of the reflexive verb compared to its non-reflexive base verb; as a result, the number of its valency complementations is reduced as well, compare, e.g., the non-reflexive verb *naklánít^{impf} – naklonit^{pf}* ‘to tilt’ in example (5-a) and the derived reflexive verb *naklánít se^{impf} – naklonit se^{pf}* ‘to lean’ in example (5-b). In this case, the semantic participant ‘Agent’, expressed in the subject in the non-reflexive verb, is deleted in the reflexive verb, and the number of its valency complementations is then reduced by one complementation.

⁹ Note that the “Lemmas” and the “Lexemes” counts on the line “all” here do not sum up to the numbers provided in Table 2 for derived reflexive verbs as a single lemma may simultaneously represent a lexical unit that is directly related and another lexical unit that is indirectly related to its non-reflexive counterpart (and thus it is counted twice); the same is valid for lexemes.

- (5) a. *(Nada a Nika).ACT-Agent trhali květy dál, stále víc nakláněli loďku.PAT-Theme.*
 ‘(Nada and Nika).ACT-Agent plucked flowers, tilting the boat.PAT-Theme more and more.’
- b. *Muž řeku za hodinu překoná, ovšem jeho loďka.ACT-Theme se cestou povážlivě naklání.*
 ‘The man crosses the river in an hour but his boat.ACT-Theme leans alarmingly along the way.’
- (ii) Systemic changes in a situation denoted by a reflexive verb are limited to relations between semantic participants of the situation, while their number and type typically remain preserved. These changes result in the change in the surface syntactic expression of one of the involved semantic participants, compare, e.g., the non-reflexive verb *nadávat impf* ‘to swear’ in example (6-a) with the reflexive verb *nadávat si impf* ‘to swear at each other’ in example (6-b): both semantic participants ‚Agent’ and ‚Recipient’ characterizing the non-reflexive verb are retained in the reflexive verb but their relation is presented as mutual. The mutual relation between these semantic participants is mirrored in the surface expression of the valency complementation **ADDR**, which is expressed by the dative case in the non-reflexive verb, see example (6-a), while in the reflexive verb it has the form of the prepositional group *s+7*,¹⁰ see example (6-b).
- (6) a. *Republikáni.ACT-Agent nadávají demokratům.ADDR-Recipient ... [modified]*
 ‘Republicans.ACT-Agent swear at Democrats.ADDR-Recipient ...’
- b. *Republikáni.ACT-Agent si nadávají s demokraty.ADDR-Recipient ...*
 (lit. Republicans.ACT-Agent swear with Democrats.ADDR-Recipient ...)
 ‘Republicans and Democrats swear at each other ...’
- (iii) A situation denoted by a reflexive verb, i.e., a number and a type of semantic participants as well as their relations, remains the same compared to its non-reflexive base verb but the mapping of the semantic participants onto valency complementations is changed (hence the surface expression of the involved semantic participants). As a result, the perspective from which the situation is viewed changes. Compare, e.g., the mapping of the semantic participants ‚Donor’ and ‚Recipient’ onto valency complementations in the non-reflexive verb *nakažovat/nakazovat_n impf – nakazit pf* ‘to infect’ in (7-a) and in the reflexive verb *nakažovat se/nakazovat_n se impf – nakazit se pf* ‘to become infected’ in (7-b). As a result, the situation denoted by these verbs is presented either from the perspective of

¹⁰ The Arabic numerals stand for morphological cases: 1 - nominative, 2 - genitive, 3 - dative, 4 - accusative, 6 - locative, and 7 - instrumental; in the case of prepositional groups, the preposition precedes the number indicating the respective case (prepositions are not translated as they can have various interpretations depending on their governing verbs).

the ‚Donor‘ (the non-reflexive verb, example (7-a)) or from the perspective of ‚Recipient‘ (the reflexive verb, example (7-b)).

- (7) a. *Když Kolumbus doplul do Ameriky, jeho námořníci_{ACT-Donor} nakazili domorodce_{PAT-Recipient} neštovicemi ...*
 ‘When Columbus reached America, his sailors_{ACT-Donor} infected the natives_{PAT-Recipient} with smallpox ...’
 b. *Domorodci_{ACT-Recipient} se nakazili od Kolumbových námořníků_{PAT-Donor} neštovicemi ... [modified]*
 ‘The natives_{ACT-Recipient} became infected with smallpox from Columbus’ sailors_{PAT-Donor} ...’

(iv) In limited cases, changes between reflexive verbs and their non-reflexive counterparts are restricted to the surface expression of the participant expressed in non-reflexive verbs as the accusative direct object. Compare, e.g., the verb *dohadovat₁(si) / dohodovat₁₁(si) impf – dohodnout (si) pf* ‘to negotiate; to fix’ in example (8-a) with the reflexive verb *dohadovat₁se / dohodovat₁₁se impf – dohodnout se pf* ‘to negotiate; to fix’ in example (8-b). In the non-reflexive verb, the semantic participant ‚Information‘ mapped onto PAT is expressed in the direct object while in the reflexive verb, it is realized as an indirect object with the form of the prepositional group na+6.

- (8) a. *Domáci oddíl chce s rozhodčím dohodnout termín_{PAT-Information} ... [modified]*
 ‘The home team wants to fix the date_{PAT-Information} with the referee ...’
 b. *Aliance se chce s Moskvou dohodnout na společné chartě_{PAT-Information} ...*
 ‘The Alliance wants to agree with Moscow on a collective charter_{PAT-Information} ...’

Based on the four types of changes introduced above, we distinguish seven types of the derived reflexive verbs that are directly related to their non-reflexive base verbs, namely decausative, autocausative, ‘partitive object’, reciprocal, converse, quasiconverse, and deaccusative reflexive verbs,¹¹ see Table 4. Basic statistics on individual types of these derived reflexive verbs can be found in Table 5 at the end of Section 4 (page 64.).

In VALLEX, the relation between derived reflexive verbs and their non-reflexive base verbs is described by general rules provided in the grammar component. These rules capture the correspondence between the affected semantic participants and valency complementations in a simple form of a table: Column I introduces the correspon-

¹¹ We refer to these types in line with Genuišienė (1987), as it was further used for Czech by Pergler (2020) and for Polish by Wiemer (2007).

Type of reflexive verbs	Type of changes	Semantic	Syntactic	
			Deep	Surface
decausative	(i)	+	+	+
autocausative	(i)	+	+	+
'partitive object'	(i)	+	+	+
reciprocal	(ii)	+	- ¹²	+
converse	(iii)	-	+	+
quasiconverse	(iii)	-	+	+
deaccusative	(iv)	-	-	+

Table 4. Individual types of the derived reflexive verbs that are directly related to their non-reflexive counterparts as identified in the VALLEX lexicon. The + sign in the columns "Semantic" and "Syntactic" indicates changes in semantic participants and in their deep and surface syntactic expression, respectively; the - sign indicates that semantic participants and their deep and surface syntactic expression are preserved.

dence in constructions of non-reflexive base verbs and column II in constructions of derived reflexive verbs (with the variables X and Y standing for valency complementations), see below. The information on changes in surface positions of the involved valency complementations then follows from their morphemic forms provided in respective valency frames. The symbol ∅ indicates that a semantic participant is not mapped onto any valency complementation, and hence it is realized neither in the deep syntactic structure nor in the surface structure. The rule is applied if the condition specified there is met, namely, if the attribute reflexverb, captured in the data component for individual lexical units of derived reflexive verbs, contains a required value, indicating the type and the subtype of a derived reflexive verb (and, if necessary, the affected valency complementations as well).

Type of reflexive verbs		name of the rule
Subtype of reflexive verbs		
condition	reflexverb: derived-type_subtype_X_Y	
	I	II
,Semantic participant 1'	X	Y
,Semantic participant 2'	Y	∅

¹² In limited cases, the semantics change in reciprocal reflexive verbs involves the change of the number of their participants; then this change is reflected in their deep and surface structure as well, see footnote 19.

4.1. Decausative Reflexive Verbs

Decausative reflexive verbs (referred to as anticausative, inchoative or spontaneous as well, see e.g., Haspelmath, 1993 and Fried, 2004) are typically derived from transitive causative verbs by the reflexive *se* (e.g., *navazovat se*^{impf} – *navázat se*^{pf} ‘to bind; to be attached together’ ← *navazovat*^{impf} – *navázat*^{pf} ‘to tie; to fasten sth to sth’, *otvírat se/otevírat se*^{impf} – *otevřít se*^{pf} ‘to open up’ ← *otvírat/otevírat*^{impf} – *otevřít*^{pf} ‘to open’, *uskutečňovat se*^{impf} – *uskutečnit se*^{pf} ‘to come into being’ ← *uskutečňovat*^{impf} – *uskutečnit*^{pf} ‘to make sth happen’). Their non-reflexive base verbs are characterized (in addition to other possible semantic participants) by two participants. The first semantic participant, mapped onto the nominative **ACT** expressed in the subject position, has the semantic role of ‚Agent’ or of ‚Causator’.¹³ These two roles alternate in individual uses of a single non-reflexive base verb, compare the two examples of the non-reflexive verb *obnovovat*^{impf} – *obnovit*^{pf} ‘to restore’ in (9-a). The second semantic participant has the role of ‚Theme’ or of ‚Patient’.^{14,15} It mostly corresponds to **PAT** realized by the prepositionless accusative in the direct object position, see examples in (9-a) and in (10-a).

- (9) a. *obnovovat*^{impf} – *obnovit*^{pf} ‘to restore; to renew sth’
ACT₁ **PAT**₄ **BEN**₃
A Haremheb^{ACT-Agent} *obnovil* také pořádek^{PAT-Theme} *ve Vesetu* ...
 ‘And Haremheb^{ACT-Agent} also restored order^{PAT-Theme} in Veset ...’
 ... *potěšení*^{ACT-Causator} *z pohybu* *obnovilo* příjemný pocit^{PAT-Theme} *v jeho nitru* ...
 ‘... the pleasure^{ACT-Causator} of movement restored a pleasant feeling^{PAT-Theme} inside him ...’
- b. *obnovovat se*^{impf} – *obnovit se*^{pf} ‘to be renewed’
ACT₁ **BEN**₃ **MEANS**₇
Pořádek^{ACT-Theme} *ve Vesetu se obnovil*. [modified]
 ‘Order^{ACT-Theme} in Veset was renewed.’
Příjemný pocit^{ACT-Theme} *v jeho nitru se obnovil*. [modified]
 ‘A pleasant feeling^{ACT-Theme} inside him was renewed.’

¹³ ‚Causator’, in contrast to ‚Agent’, lacks volitional features. Distinguishing these two roles is justified by the fact that decausative reflexive verbs have a systemic relation to quasiconverse reflexive verbs that operate only with ‚Causator’, see Section 4.6.

¹⁴ ‚Patient’ differs from ‚Theme’ in animate features. These two roles split the group of non-reflexive base verbs into two subgroups, syntactic constructions of which exhibit a different type of ambiguity, see the remark below.

¹⁵ For a small group of decausative verbs, the second semantic participant, being of the propositional character, has the role ‚Phenomenon’. These verbs follow the same pattern as those decausative verbs with the ‚Theme’ participant. However, in contrast to these decausative verbs, ‚Phenomenon’ can be realized by the infinitive or by dependent content clauses as well. In the grammar component, these decausative verbs are described by a separate rule.

- (10) a. *utápět^{impf} – utopit^{pf}* ‘to drown sb/sth’
 ACT₁ PAT₄
 ... *spodní zpětné proudy*.ACT-Causator *mohou ... utopit neopatrné plavce*.PAT-Patient
 ...
 ‘... lower backcurrents.ACT-Causator can drown unwary swimmers.PAT-Patient ...’
- b. *utápět se^{impf} – utopit se^{pf}* ‘to drown; to be drowned’
 ACT₁ CAUS₇
 ... *neopatrní plavci*.ACT-Patient *se mohou utopit* ... [modified]
 ‘... unwary swimmers.ACT-Patient may drown ...’
 ... *mladík*.ACT-Patient *se utopil* ... [made-up]
 ‘... the youth.ACT-Patient drowned ...’

In decausative reflexive verbs, the first semantic participant ‚Agent‘ or ‚Causator‘ is deleted. The remaining semantic participant ‚Theme‘ or ‚Patient‘ is then realized as the nominative **ACT** in the subject position. As a result, the valency structure of decausative reflexive verbs – compared to the valency structure of their non-reflexive counterparts – is reduced by one valency complementation, typically by **PAT** expressed in non-reflexive verbs by the accusative, see the valency frames and the examples of the decausative reflexive verb *obnovovat se^{impf} – obnovit se^{pf}* ‘to be renewed’ in (9-b) and of the verb *utápět se^{impf} – utopit se^{pf}* ‘to drown; to be drowned’ in (10-b).

As a consequence of the changes in semantic participants, decausative reflexive verbs are deprived of the causative feature and the event expressed by these verbs appears to be uncontrolled, spontaneous or accidental (see esp. Genuišienė, 1987; Fehrmann et al., 2014; Haspelmath, 1993 and for Czech Fried, 2004).

Remark on ambiguity. Decausative reflexive verbs are the source of two types of ambiguity, systematically related to the type of the second affected semantic participant. The first type is tied to the participant ‚Theme‘. It can be illustrated with the first sentence in example (9-b): this construction can be interpreted either as a construction of the decausative reflexive verb *obnovovat se^{impf} – obnovit se^{pf}* in the sense “the order was renewed by itself” or as a deagentive construction of the non-reflexive base verb *obnovovat^{impf} – obnovit^{pf}* with the generalized **ACT**, which is not expressed on the surface, in the sense “somebody restored the order” (see Section 3.2.1).

The second type of ambiguity is associated with ‚Patient‘, see, e.g., the second sentence in example (10-b): this sentence can be interpreted either as a construction of the decausative reflexive verb *utápět se^{impf} – utopit se^{pf}* in the sense “the youth drowned accidentally” or as a syntactically reflexive construction of the non-reflexive base verb *utápět^{impf} – utopit^{pf}* in the sense “the youth drowned himself (on purpose)”.

Representation of Decausative Reflexive Verbs in VALLEX

In VALLEX, there are 374 lexical units of derived reflexive verbs classified as decausative reflexive verbs. These lexical units are contained in 300 lexemes, represented

by 549 verb lemmas. In the data component, each lexical unit of a decausative reflexive verb is assigned the value *derived-decaus* provided in the attribute *reflexverb*. In addition, this attribute provides the link to a respective lexical unit of the non-reflexive base verb. The value *derived-decaus* is then further specified by the suffix identifying the second participant affected by the change (i.e., ‚Theme‘, ‚Patient‘,¹⁶ and ‚Phenomenon‘, see footnote 15), and thus this value uniquely determines the rule describing the relation between the decausative reflexive verb and its non-reflexive base verb.

In the grammar component, three formal rules describe differences in semantic and syntactic properties of decausative reflexive verbs. For example, rule R1, *decaus_theme*, captures the relation between decausative reflexive verbs with ‚Theme‘ (the column II) and their non-reflexive base verbs (the column I): this rule stipulates that ‚Theme‘ mapped onto **PAT** in non-reflexive base verbs corresponds to **ACT** in decausative reflexive verbs and that ‚Agent‘ or ‚Causator‘ corresponding to **ACT** in non-reflexive verbs is not mapped onto any valency complementation in decausative reflexive verbs.

Decausative reflexive verbs		Rule R1	
Theme		<i>decaus_theme</i>	
condition	<i>reflexverb: derived-decaus_theme</i>		
	I	II	
‚Agent Causator‘	ACT	∅	
‚Theme‘	PAT	ACT	

4.2. Autocausative Reflexive Verbs

Non-reflexive base verbs of autocausative reflexive verbs (e.g., *odlišovat se*^{impf} – *odlišit se*^{pf} ‘to become different’ ← *odlišovat*^{impf} – *odlišit*^{pf} ‘to differentiate’, *otáčet se*^{impf} – *otočit se*^{pf} ‘to rotate; to be turning’ ← *otáčet*^{impf} – *otočit*^{pf} ‘to turn’, *ulevovat si*^{impf} – *ulevit si*^{pf} ‘to be relieved of’ ← *ulevovat*^{impf} – *ulevit*^{pf} ‘to ease; to relieve sb’) are characterized (besides other possible participants) by two semantic participants. The first participant ‚Agent‘ is mapped onto **ACT** expressed in the nominative subject. The second participant can have either the role of ‚Patient‘ or of ‚Recipient‘, both having animate features. ‚Patient‘ mostly corresponds to **PAT**, less often to **ADDR**, realized predominantly in the direct object expressed by the prepositionless accusative, see an example of the non-reflexive verb *oženit*^{pf} ‘to marry sb to sb’ in (11-a).¹⁷ If the second seman-

¹⁶ In the case of ‚Patient‘, the valency complementation onto which this participant is mapped in non-reflexive verbs has to be provided in the suffix as well.

¹⁷ In a limited number of cases, this valency complementation can be expressed as an indirect object by the prepositionless dative, by the prepositionless instrumental or by the prepositional group *s+7*.

tic participant is represented by ‚Recipient‘, it corresponds to **ADDR** realized as an indirect object expressed by the prepositionless dative, see an example of the verb *připomínat^{impf} – připomenout^{pf}* ‘to remind sb of sth’ in (12-a).

The morphemic form of the second affected valency complementation (either **PAT** or **ADDR**) determines the choice of the reflexive deriving autocausative reflexive verbs. If it has the form of the prepositionless accusative (sporadically, of the instrumental or of the prepositional group s+7, see footnote 17) the reflexive *se* is selected, as illustrated with the verb *oženit se^{pf}* ‘to get married’, see example (11-b). The prepositionless dative underlies the choice of the reflexive *si* as the verb *připomínat si^{impf} – připomenout si^{pf}* ‘to remember’ shows, see example (12-b).

In autocausative reflexive verbs, either ‚Agent‘ and ‚Patient‘ or ‚Agent‘ and ‚Recipient‘ are conflated into a single semantic participant, involving features of both of them: the participant does an activity as ‚Agent‘ and at the same time it is either affected by this activity as ‚Patient‘, see example (11-b), or this activity is directed to him as to ‚Recipient‘, see example (12-b). As a result, the number of semantic participants of autocausative reflexive verbs, and hence the number of their valency complementations, is reduced by one participant and by one valency complementations, respectively, compared to their non-reflexive base verbs. The affected participant with the features of both ‚Agent‘ and ‚Patient‘, or of both ‚Agent‘ and ‚Recipient‘ is then mapped onto **ACT** expressed in the nominative subject, see examples (11-b) and (12-b), respectively.

Autocausative reflexive verbs are not syntactically distinguished from decausative reflexive verbs (Section 4.1). However, they differ in the characteristics of participants mapped onto their **ACT**: while **ACT** of decausative reflexive verbs corresponds to ‚Theme‘ or to ‚Patient‘, **ACT** of autocausative reflexive verbs corresponds to the participant combining the features of both ‚Agent‘ and ‚Patient‘ or ‚Recipient‘, preserving thus agentivity in these reflexive verbs. The fact is evidenced, e.g., by their compatibility with adverbials expressing intentionality (e.g., *úmyslně, záměrně, schválně* ‘on purpose’).

- (11) a. *oženit^{pf}* ‘to marry sb to sb’
ACT₁ **ADDR**_{s+7} **PAT**₄
Boženka_{ACT-Agent} před léty Arnošta_{PAT-Patient} oženila s nepraktickou bohatou Helgou ...
 ‘Years ago, Boženka_{ACT-Agent} married Arnošt_{PAT-Patient} to impractical rich Helga ...’
- b. *oženit se^{pf}* ‘to get married’
ACT₁ **PAT**_{s+7}
Před léty se Arnošt_{ACT-Agent+Patient} oženil s nepraktickou bohatou Helgou ... [modified]
 ‘Years ago, Arnošt_{ACT-Agent+Patient} got married to impractical rich Helga ...’
- (12) a. *připomínat^{impf} – připomenout^{pf}* ‘to remind sb of sth’
ACT₁ **ADDR**₃ **PAT**_{4,dcc}

*Trhovci*_{ACT-Agent} *návštěvníkům*_{ADDR-Recipient} *připomenou* stará, mnohdy už zapomenutá řemesla.

'Traders_{ACT-Agent} will remind visitors_{ADDR-Recipient} of old, often forgotten crafts.'

- b. *připomínat si*_{impf} – *připomenout si*_{pf} 'to remember'

ACT₁ **PAT**_{4,dcc}

*Návštěvníci*_{ACT-Agent+Recipient} *si připomenou* stará, mnohdy už zapomenutá řemesla.
[modified]

'Visitors_{ACT-Agent+Recipient} will remember old, often forgotten crafts.'

Representation of Autocausative Reflexive Verbs in VALLEX

In the data component of VALLEX, autocausative reflexive verbs are indicated by the value derived-autocaus provided in the attribute reflexverb (249 lexical units contained in 208 lexemes, which are represented by 372 verb lemmas). Autocausative reflexive verbs are further subclassified with respect to the second participant affected by the change, uniquely identifying the respective rule.¹⁸

In the grammar component, two rules describe the relation between autocausative reflexive verbs and their non-reflexive base verbs. For example, rule R2, autocaus_recipient, captures the changes in the mapping of semantic participants ‚Agent‘ and ‚Recipient‘ onto valency complementations in autocausative reflexive verbs (column II) and in their non-reflexive counterparts (column I). It determines that ‚Agent‘ is mapped onto **ACT** and ‚Recipient‘ onto **ADDR** in non-reflexive verbs while in autocausative reflexive verbs, these two participants are conflated into the single one (the symbol +) that corresponds to **ACT**, as examples (12-a) and (12-b) above illustrate.

Autocausative reflexive verbs		Rule R2
Recipient		autocaus_recipient
condition	reflexverb: derived-autocaus_recipient	
	I	II
‚Agent‘	ACT	∅
‚Recipient‘	ADDR	∅
‚Agent + Recipient‘	∅	ACT

4.3. ‚Partitive Object‘ Reflexive Verbs

‚Partitive object‘ reflexive verbs are derived from non-reflexive verbs by the reflexive *se* (e.g., *odvracet se*_{impf} – *odvrátit se*_{pf} ‘to turn away’ ← *odvracet*_{impf} – *odvrátit*_{pf} ‘to turn sth away’, *ovládat se*_{impf} – *ovládnout se*_{pf} ‘to control oneself’ ← *ovládat*_{impf} – *ovládnout*_{pf} ‘to

¹⁸ In the case of ‚Patient‘, the suffix of the value further specifies whether the changes involve **ADDR** or **PAT**.

control sth', *zaměřovat se^{impf} – zaměřit se^{pf}* 'to focus on sth' ← *zaměřovat^{impf} – zaměřit^{pf}* 'to focus on st'). The non-reflexive verbs from which 'partitive object' reflexive verbs derive are characterized (in addition to other possible semantic participants) by the participants ,Agent' and ,Theme'. The latter participant represents inalienable possession of ,Agent', coming from several semantically restricted domains: it can be ,Agent's body parts, characteristic features, emotions, ideas etc. ,Agent' is mapped onto the nominative ACT expressed in the subject position and ,Theme' typically corresponds to PAT, which is predominantly realized by the prepositionless accusative as the direct object, see an example of the verb *soustředovat^{impf} – soustředit^{pf}* 'to focus sth on sth' in (13-a). In limited cases, PAT is realized as an indirect object by the prepositionless instrumental, see an example of the verb *kroutit^{impf}* 'to twist sth' in (14-a).

In 'partitive object' reflexive verbs, the mapping of the semantic participant ,Agent' is preserved: it still corresponds to the nominative ACT expressed as the subject. The participant ,Theme' does not, however, correspond to any valency complementation, despite being implied by these reflexive verbs. As a consequence, the corresponding PAT complementation is deleted from valency frames of 'partitive object' reflexive verbs. These frames – compared to valency frames of their non-reflexive base verbs – are thus reduced by one valency position, see examples of the 'partitive object' verb *soustředovat se^{impf} – soustředit se^{pf}* 'to focus on sth' in (13-b) and of the verb *kroutit se^{impf}* 'to twist' in (14-b).

- (13) a. *soustředovat^{impf} – soustředit^{pf}* 'to focus sth on sth'
 ACT₁ PAT₄ EFF_{k+3,na+4}
Společnost Heineken.ACT-Agent soustředí svou pozornost.PAT-Theme na ochranu vodních zdrojů ...
 'Heineken.ACT-Agent focuses its attention.PAT-Theme on the protection of water resources ...'
- b. *soustředovat se^{impf} – soustředit se^{pf}* 'to focus on sth'
 ACT₁ PAT_{k+3,na+4}
Společnost Heineken.ACT-Agent se soustředí na ochranu vodních zdrojů ... [modified]
 'Heineken.ACT-Agent focuses on the protection of water resources ...'
- (14) a. *kroutit^{impf}* 'to twist sth'
 ACT₁ PAT_{7,s+7} DIR
Tanečnice.ACT-Agent kroutí pánví.PAT-Theme, jako by se zrovna ocitla v Riu na karnevalu.
 'The dancer.ACT-Agent twists her pelvis.PAT-Theme like she is at the carnival in Rio.'
- b. *kroutit se^{impf}* 'to twist'
 ACT₁ CAUS₇
Tanečnice.ACT-Agent se kroutí, jako by se zrovna ocitla v Riu na karnevalu. [modified]
 'The dancer twists like she is at the carnival in Rio.'

Representation of ‘Partitive Object’ Reflexive Verbs in VALLEX

In the data component of VALLEX, 54 lexical units of reflexive verbs in 51 lexemes, which are represented by 94 verb lemmas, are assigned the value *derived-partobject* in the attribute *reflexverb*. To the value, the respective valency complementation onto which ‚Theme‘ is mapped in non-reflexive base verbs is suffixed.

In the grammar component, a single rule R3, *partobject*, describes the relation between ‘partitive object’ reflexive verbs and their respective base verbs. This rule states that ‚Theme‘ mapped onto the valency complementation of a non-reflexive base verb, represented in the rule by the variable *Y*, does not correspond to any complementation in the respective ‘partitive object’ verb. Further, it stipulates that the mapping of ‚Agent‘ onto **ACT** remains the same in both partitive object verbs and their non-reflexive base verbs, compare the pair of examples (13-a) and (13-b) and of examples (14-a) and (14-b).

‘Partitive object’ reflexive verbs		Rule R3 <i>partobject</i>
condition	<i>reflexverb: derived-partobject_Y</i>	
‚Agent‘	ACT	ACT
‚Theme‘	<i>Y</i>	∅

4.4. Reciprocal Reflexive Verbs

Reciprocal reflexive verbs belong to the so-called inherently reciprocal verbs, i.e., to the verbs that express mutuality between some of their participants in their lexical meaning. Their non-reflexive counterparts are characterized (besides other semantic participants) by two participants. The first semantic participant, ‚Agent‘, is mapped onto the nominative **ACT** expressed in the subject position. The latter has either the role of ‚Patient‘ or of ‚Recipient‘. ‚Patient‘ is mapped onto **PAT**, mostly expressed by the prepositionless accusative in the direct object position, as exemplified by the verb *nenávidět^{impf}* ‘to hate’ in (15-a); in fewer cases, **PAT** is expressed by the prepositionless dative as an indirect object. ‚Recipient‘, as the latter possible participant, is mapped onto **ADDR** (sporadically onto **PAT**), typically expressed by the dative in an indirect object, as, e.g., the verb *půjčovat^{impf} – půjčit^{pf}* ‘to lend sth to sb’ in (16-a) illustrates.

The morphemic form of the second affected valency complementation (either **PAT** or **ADDR**) determines the form of the reflexive as a derivational means in reciprocal reflexive verbs. If it has the form of the accusative, the reflexive *se* is applied in the derivation, as exemplified by the reciprocal reflexive verb *nenávidět se^{impf}* ‘to hate each

other' in example (15-b). In contrast, the dative conditions the choice of the reflexive *si*, see the verb *půjčovat si*^{impf} – *půjčit si*^{pf} 'to lend sth to each other' in example (16-b).

In reciprocal reflexive verbs, the two semantic participants, ‚Agent‘ and ‚Patient‘ or ‚Agent‘ and ‚Recipient‘, are retained as well as their mapping onto valency complementations.¹⁹ However, the relation between them changes. In contrast to non-reflexive base verbs, these two participants are involved in a mutual relation. As a result, an event denoted by a reciprocal reflexive verb is conceived as a mutual action of the affected participants. The mutuality of the two participants is formally manifested by the change of the form of the second valency complementation, onto which ‚Patient‘ or ‚Recipient‘ is mapped: in reciprocal reflexive verbs, this valency complementation has uniformly the form of the prepositional group *s+7* and it is thus realized on the surface as an indirect object, see the verb *nenávidět se*^{impf} 'to hate each other' in example (15-b) and the verb *půjčovat si*^{impf} – *půjčit si*^{pf} 'to lend sth to each other' in example (16-b).

- (15) a. *nenávidět*^{impf} 'to hate'
 ACT₁ PAT_{4,inf,dcc}
Manžel.ACT-Agent *nenávidí všechny moje kamarádky*.PAT-Patient.
 'My husband.ACT-Agent hates all my friends.PAT-Patient.'
- b. *nenávidět se*^{impf} 'to hate each other'
 ACT₁ PAT_{s+7}
Manžel.ACT-Agent *se nenávidí se všemi mými kamarádkami*.PAT-Patient. [modified]
 (lit. My husband.ACT-Agent hates with all my friends.PAT-Patient.)
 'My husband and all my friends hate each other.'
- (16) a. *půjčovat*^{impf} – *půjčit*^{pf} 'to lend sth to sb'
 ACT₁ ADDR₃ PAT₄ AIM_{k+3,na+4} BEN_{pro+4}
Kamarádky.ACT-Agent *jí*.ADDR-Recipient *půjčují masky*. [modified]
 'Her friends.ACT-Agent lend masks to her.ADDR-Recipient.'
- b. *půjčovat si*^{impf} – *půjčit si*^{pf} 'to lend sth to each other'
 ACT₁ ADDR_{s+7} PAT₄
 (*Ona*).ACT-Agent *si půjčuje masky s kamarádkami*.ADDR-Recipient.
 (lit. She.ACT-Agent lends masks with her friends.ADDR-Recipient.)
 'She and her friends lend masks to each other.'

¹⁹ In limited cases, the valency structure of reciprocal reflexive verbs is changed more significantly and one valency complementation is either added (e.g., *bít se*^{impf} 'to fight with sb') or deleted (e.g., *házet si*^{impf} 'to throw a ball with each other'), and the mapping of semantic participants onto valency complementations then typically changes. In these cases, reciprocal reflexive verbs – compared to their non-reflexive base verbs – are typically subject to semantic shifts and they thus border on the derived reflexive verbs indirectly semantically and syntactically related to their non-reflexive counterparts (see Section 3.2.2).

Representation of Reciprocal Reflexive Verbs in VALLEX

In the data component of VALLEX, reciprocal reflexive verbs are assigned the value *derived-recipr* in the attribute *reflexverb* (85 lexical units in 84 lexemes, represented by 118 verb lemmas). This value is supplemented with the suffix identifying the respective rule that describes the relation between a reciprocal reflexive verb and its non-reflexive base verb. The suffix consists of the second involved participant (either ‚Patient‘ or ‚Recipient‘) followed by the valency complementation onto which the respective participant is mapped.²⁰

Two rules handle the relation between reciprocal reflexive verbs and their non-reflexive counterparts, one for each of the pairs ‚Agent‘-, ‚Patient‘ and ‚Agent‘-, ‚Recipient‘.²¹ For example, rule R4, *recipr_recipient*, applies to reciprocal reflexive verbs with ‚Recipient‘, as illustrated here with the verb *půjčovat si^{impf} – půjčit si^{pf}* ‘to lend sth to each other‘ in (16-b). The variable *Y* in the rule stands for the same valency complementation onto which ‚Recipient‘ is mapped in both reciprocal reflexive verbs and their non-reflexive base verbs (mostly for *ADDR*, sporadically for *PAT*). The rule states that both ‚Agent‘ and ‚Recipient‘ do not change their mapping onto valency complementations in reciprocal reflexive verbs (column II) compared to their non-reflexive base verbs (column I), as illustrated by the examples in (16-a) and in (16-b). The change in the morphemic form of *ADDR* or *PAT*, indicating the change in its surface expression, is captured in valency frames of reciprocal reflexive verbs provided in the data component.

Reciprocal reflexive verbs		Rule R4
Recipient		<i>recipr_recipient</i>
condition	<i>reflexverb: derived-recipr_recipient_Y</i>	
	I	II
‚Agent‘ ‚Recipient‘	ACT Y	ACT Y

²⁰ Typically, there is only one valency complementation to which the respective participant corresponds in both non-reflexive base verbs and derived reflexive verbs. When more complex changes take place, see footnote 19, two complementations come into play; then the first complementation in the suffix comes from the valency frame of a non-reflexive base verb and the latter from the frame of the respective reciprocal reflexive verb.

²¹ Two additional rules are necessary to handle more complex changes of the valency structure in the reciprocal verbs mentioned in footnote 19.

4.5. Converse Reflexive Verbs

Converse reflexive verbs and their non-reflexive counterparts denote the same situation, characterized by the same set of semantic participants. Two of these participants, however, change their mapping onto valency complementations; as a consequence, they are expressed in different surface positions. More specifically, in converse reflexive verbs and in their non-reflexive base verbs, the prominent subject position is occupied each time by a different semantic participant from the affected pair and the situation expressed by these verbs is thus presented from the perspective of the relevant participant. For example, the non-reflexive verb *naučit^{pf}* ‘to teach’, presents the situation denoted by the verb from the perspective of ‚Speaker‘, see example (17-a). In contrast, the converse reflexive verb *naučit se^{pf}* ‘to learn’ adopts the perspective of ‚Recipient‘, see example (17-b).

Converse reflexive verbs split into several semantic subtypes; in VALLEX, they are subclassified according to the semantic participants affected by the changes in the mapping onto valency complementations: ‚Speaker‘-, ‚Recipient‘, see examples (17-a) and (17-b), ‚Donor‘-, ‚Recipient‘, see examples (7-a) and (7-b) in Section 4, ‚Experiencer‘-, ‚Stimulus‘, ‚Locatum‘-, ‚Location‘, see examples (18-a) and (18-b), ‚Bearer of action‘-, ‚Location‘.²²

- (17) a. *naučit^{pf}* ‘to teach’
 ACT₁ ADDR₄ PAT_{3,4,inf,dcc} MANN
Svému umění uzdravovat Asklepia.ADDR-Recipient naučil Cheirón.ACT-Speaker. [modified]
 ‘Chiron.ACT-Speaker taught Asclepius.ADDR-Recipient his art of healing.’
- b. *naučit se^{pf}* ‘to learn’
 ACT₁ PAT_{3,4,inf,dcc} ORIG_{od+2,z+2} MANN
Svému umění uzdravovat se Asklepios.ACT-Recipient naučil od Cheiróna.ORIG-Speaker.
 ‘Asclepius.ACT-Recipient learned his art of healing from Chiron.ORIG-Speaker.’
- (18) a. *plnit^{impf}* ‘to fill sth’
 ACT₁ PAT₄ EFF₇
 ... děti rády pozorují, jak nádoby.PAT-Location plní dešťová voda.ACT-Locatum. [modified]
 ‘... children like watching rainwater.ACT-Locatum filling the containers.PAT-Location’
- b. *plnit se^{impf}* ‘to fill with sth’ ACT₁ PAT₇
 ... děti rády pozorují, jak se nádoby.ACT-Location plní dešťovou vodou.PAT-Locatum.
 ‘... children like watching the containers.ACT-Location filling with rainwater.PAT-Locatum’

²² In VALLEX, there are other 7 lexical units of verbs that are so semantically heterogeneous that they are difficult to be classified. These cases draw attention to the fact that the converse function of the reflexive is not hypothetically limited to the semantic types listed above but it may have a broader scope.

Representation of Converse Reflexive Verbs in VALLEX

In VALLEX, there are 67 lexical units of reflexive verbs in 64 lexemes, represented by 103 verb lemmas, that are assigned the value *derived-conv* in the attribute *reflexverb*. This value is suffixed with the semantic participants that are subject to the changes in their mapping onto valency complementations; where necessary, they are supplemented with the affected valency complementations (or the variables representing them).

Six rules describe the relations between converse reflexive verbs and their non-reflexive base verbs: one rule for each semantic type listed above (the only exception being the converse reflexive verbs of the ‚Locatum‘ and ‚Location‘ type, which are described by two rules). In addition, one general rule captures the relation between verbs which are difficult to be semantically classified.²³ For example, rule R5, *conv_speaker_recipient*, applies to the converse reflexive verbs in which the changes in the mapping onto valency complementations involve the semantic participants ‚Speaker‘ and ‚Recipient‘, as exemplified by the verb *naučit se^{pf}* ‘to learn’. The rule stipulates that in the non-reflexive verb *naučit^{pf}* ‘to teach’ (column I), ‚Speaker‘ corresponds to **ACT** and ‚Recipient‘ to the valency complementation **ADDR**. In the reflexive verb *naučit se^{pf}* ‘to learn’ (column II), it is ‚Recipient‘ that is mapped onto **ACT** while ‚Speaker‘ corresponds to **ORIG**, compare examples (17-a) and (17-b).

Converse reflexive verbs		Rule R5
Speaker-Recipient		<i>conv_speaker_recipient</i>
condition	reflexverb: <i>derived-conv_speaker_recipient</i>	
	I	II
‚Speaker‘	ACT	ORIG
‚Recipient‘	ADDR	ACT

4.6. Quasiconverse Reflexive Verbs

Similarly to converse reflexive verbs (Section 4.5), quasiconverse reflexive verbs express the same situation as their non-reflexive base verbs, consisting of the same set of semantic participants, which are, however, mapped each time onto different valency complementations. In contrast to converse reflexive verbs, one of the affected valency complementations in quasiconverse reflexive verbs is represented either by an optional free modification or by a quasi-actant. Depending on the presence or

²³ See footnote 22. Moreover, there are two lexical units of verbs in which the changes in the mapping onto valency complementations involve the participants ‚Substance‘ and ‚Source‘. The description of these verbs would require a separate rule. However, with respect to their sparseness, we leave them aside.

the absence of this complementation in the surface structure, the sentence has either a converse interpretation (if present), or a decausative interpretation (if absent) (see Section 4.1).

In quasiconverse reflexive verbs and their non-reflexive base verbs, the changes in the mapping affect the pair of the semantic participants ‚Causator‘-, ‚Theme‘ or the pair ‚Causator‘-, ‚Patient‘. In non-reflexive verbs, ‚Causator‘ corresponds to the nominative **ACT** and ‚Theme‘ or ‚Patient‘ to **PAT**, mostly expressed by the prepositionless accusative in the direct object position,²⁴ see the non-reflexive verb *lámat impf* ‚to break sth‘ in example (19-a). In contrast, in quasiconverse reflexive verbs, it is the semantic participant ‚Theme‘ or ‚Patient‘ that is mapped onto the nominative **ACT** expressed in the subject while ‚Causator‘ corresponds to an optional free modification or to a quasi-actant. For instance, in the first example of the verb *lámat se impf* ‚to break; to crack‘ in (19-b), ‚Causator‘ is mapped onto the optional free modification **CAUS** or **LOC**, and in the second example, onto the quasi-actant **OBST**. If such a complementation is not expressed on the surface, and ‚Causator‘ is thus not present, the event is interpreted as spontaneous (then the verb is interpreted as a decausative reflexive verb, see Section 4.1).

- (19) a. *lámat impf* ‚to break sth‘
ACT₁ **PAT**₄ **EFF**_{na+4} **OBST**_{o+4} **BEN**₃
 ... *vítr*.**ACT-Causator** *láme strom*.**PAT-Theme** *s korunou zlatých listů* ... [modified]
 ‚... the wind.**ACT-Causator** breaks the tree.**PAT-Theme** with a crown of golden leaves ...‘
 ...
 ... *vlňolam*.**ACT-Causator** *láme vlňny*.**PAT-Theme** ... [modified]
 ‚... the breakwater **ACT-Causator** breaks waves.**PAT-Theme** ...‘
- b. *lámat se impf* ‚to break; to crack‘
ACT₁ **PAT**_{na+4} **OBST**_{o+4} **CAUS**₇ **LOC**
 ... *strom*.**ACT-Theme** *s korunou zlatých listů se láme větrem*.**CAUS-Causator** / *ve větru*.**LOC-Causator** ... [modified]
 ‚... the tree.**ACT-Theme** with a crown of golden leaves breaks in the wind.**LOC-Causator** ...‘
 ...
 ... *vlňny*.**ACT-Theme** *se lámou o vlňolam*.**OBST-Causator** ... [modified]
 ‚... the waves.**ACT-Theme** break on the breakwater **OBST-Causator** ...‘

Representation of Quasiconverse Reflexive Verbs in VALLEX

In VALLEX, 225 lexical units of reflexive verbs in 195 lexemes, represented by 369 verb lemmas, are indicated as quasiconverse reflexive verbs by the value *derived-quasiconv*, provided in the attribute *reflexverb*. The suffix of the value consists of those optional free modifications and/or the quasi-actant **OBST** onto which ‚Causator‘ can

²⁴ In limited cases, it is realized by the prepositionless instrumental or by the prepositional group *s+7* in an indirect object position.

be mapped in quasiconverse reflexive verbs (separated with the symbol | if ‚Causator‘ can correspond to more than one valency complementation in a single verb).

The relation of quasiconverse reflexive verbs to their non-reflexive counterparts describes a single rule R6, *quasiconv*, where ‚Theme‘ and ‚Patient‘ are subsumed under the general role ‚Object‘. The rule stipulates that ‚Causator‘ mapped onto **ACT** in non-reflexive verbs (column I) corresponds to the complementation represented by the variable **Y** in quasiconverse reflexive verbs (column II); this variable can stand for the optional complementations **CAUS**, **MEANS**, **LOC** or **DIR3**, or for the quasi-actant **OBST**. Further, the rule states that ‚Theme‘ or ‚Patient‘ corresponding to **PAT** in non-reflexive verbs changes its mapping onto **ACT** in reflexive verbs.

Quasiconverse reflexive verbs		Rule R6 quasiconv
condition	reflexverb: derived-quasiconv_Y	
	I	II
‚Causator‘ ‚Object‘	ACT PAT	Y ACT

4.7. Deaccusative Reflexive Verbs

The change between deaccusative reflexive verbs and their non-reflexive counterparts is limited to the surface expression of the participant expressed in the accusative direct object in non-reflexive verbs. For this semantic participant, the semantic roles of ‚Information‘, ‚Theme‘, ‚Phenomenon‘, and ‚Recipient‘ are attested in *VALLEX*. It corresponds mostly to **PAT**, rarely to **ADDR** (in the case of ‚Recipient‘). In non-reflexive verbs, this valency complementation is expressed on the surface as the direct object while in reflexive verbs, it is demoted, being realized as an indirect object.

For example, in the non-reflexive verb *svěřovat^{impf} –ověřit^{pf}* ‘to confide’, the participant ‚Information‘ mapped onto **PAT** is realized as the direct object while in the reflexive verb *svěřovat se^{impf} –ověřit se^{pf}* ‘to confide’, it is expressed as an indirect object, as the change of the morphemic form of **PAT** from the prepositionless accusative into the prepositional group s+7 indicates, compare examples (20-a) and (20-b).

- (20) a. *svěřovat^{impf} –ověřit^{pf}* ‘to confide’
ACT₁ **ADDR**₃ **PAT**_{4, dcc}
Před šesti lety mladá ženaověřila svému muži tajemství.^{PAT-Information z dětství.}
 [modified]
 ‘Six years ago, a young woman confided a secret from her childhood to her husband.’

- b. *svěřovat se* ^{impf} – *svěřit se* ^{pf} ‘to confide’

ACT₁ ADDR₃ PAT_{s+7,dcc}

Před šesti lety se mladá žena svěřila svému muži s tajemstvím. PAT-Information z dětství.

‘Six years ago, a young woman confided a secret PAT-Information from her childhood to her husband.’

Representation of Deaccusative Reflexive Verbs in VALLEX

In VALLEX, 38 lexical units of reflexive verbs, contained in 37 lexemes, represented by 70 lemmas, have the value *derived-deaccus* in the attribute *reflexverb*. The suffix of the value indicates **PAT** or **ADDR** onto which the affected participant is mapped.

The relation of deaccusative reflexive verbs and their non-reflexive counterparts is described by a single rule R7, *derived-deaccus*, where the role ‘Object’, ‘Information’, ‘Theme’, ‘Phenomenon’, and ‘Recipient’. The rule stipulates that this participant preserves the same correspondence in deaccusative reflexive verbs as in their non-reflexive base verbs (represented in the rule by the variable **Y**, standing mostly for **PAT**, rarely for **ADDR**). Morphemic forms of this valency complementation, provided in valency frames, indicate changes in its surface expression.

Deaccusative reflexive verbs		Rule R7 deaccus
condition	reflexverb: derived-deaccus_Y	
	I	II
‘Object’	Y	Y

5. Conclusion

Reflexive verbs, i.e., verbs with the clitic reflexive *se* or *si* that is classified as a derivational morpheme, being an obligatory or an optional part of lexemes of these verbs, represent a substantial portion of data in a lexicon. In the VALLEX lexicon, reflexive verbs cover one quarter of all lexical units of verbs (1 697 lexical units out of 6 859) and more than one third verb lemmas (1 701 lemmas out of 4 664). Here we have introduced their representation in this lexicon. As the main contribution of this paper,

²⁵ Let us stress that the sums for individual types of reflexive verbs in the row “all” do not add up to the total numbers for directly related derived reflexive verbs (as indicated in Table 3) due to the fact that a single lexical unit of a reflexive verb can enter into different relations with a lexical unit of its non-reflexive base verb (as exemplified, e.g., in Section 4.6 by lexical units with either a converse interpretation, or a decausative interpretation); in such cases, it is counted more times. As this issue deserves further analysis going out of scope of this paper, we leave it aside here.

Type of reflexive verbs	Data			Grammar
	Lexical Units	Lemmas	Lexemes	Rules
decausative	374	549	300	3
autocausative	249	372	208	2
'partitive object'	54	94	51	1
reciprocal	85	118	84	4
converse	67	103	64	7
quasiconverse	225	369	195	1
deaccusative	38	70	37	1
all ²⁵	1 092	1 675	939	19

Table 5. The basic statistics on different types of the derived reflexive verbs directly related to their non-reflexive base verbs.

derived reflexive verbs have been classified on the basis of changes in their semantic properties and in their valency behavior compared to their respective non-reflexive base verbs. Seven types of derived reflexive verbs are distinguished, which have not been discussed so far in detail in Czech linguistics: decausative, autocausative, 'partitive object', reciprocal, converse, quasiconverse, and deaccusative reflexive verbs.

We have described how individual types of reflexive verbs are represented in the VALLEX lexicon, making use of the division of the lexicon into the data component and the grammar component. In the data component, each reflexive verb is assigned the attribute *reflexverb*, the value of which distinguishes whether the reflexive verb belongs to the *reflexiva tantum* (the value *tantum*) or to the derived reflexive verbs (the value *derived*). Within derived reflexive verbs, a line is drawn between those verbs that have a direct semantic and/or syntactic relation to their non-reflexive base verbs and those with just an indirect relation to the base verbs. The derived reflexive verbs with a direct relation to their non-reflexive base verbs are then categorized into the 7 types, indicated in the suffix of the value *derived*. In each lexical unit of a derived reflexive verb, the suffix further specifies all the information necessary for the identification of the respective formal rule describing the relation of the reflexive verb to its non-reflexive base verb. In the grammar component, 19 rules are stored, providing the information on changes in the mapping of semantic participants of derived reflexive verbs onto valency complementations.

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