Inherently Reciprocal Predicates – Do They Exist At All?

Markéta Lopatková, Václava Kettnerová

Charles University, Faculty of Mathematics and Physics, Institute of Formal and Applied Linguistics, Malostranské nám. 25, Prague, 118 00, Czech Republic

Abstract

Reciprocity and mutuality represent phenomena intensively studied both in linguistics and in formal semantics. Here we focus on inherently reciprocal predicates, i.e., predicates bearing the feature of mutuality in their lexical meaning. While there is a consensus generally accepted by linguists that such predicates most likely exist in all natural languages, a reliable criterion defining this type of predicates is still missing. The usual definition – adopted from formal semantics – appears to be too strong for natural language predicates, leading to the contraintuitive conclusion that such predicates do not exist at all. Here, inspired by [1], we redefine the criterion. The proposed weaker definition allows us to group predicates of a natural language in a more appropriate way, reflecting their syntactic behavior and thus enabling their adequate lexicographic description.

Keywords

mutuality, symmetry, reciprocity, inherently reciprocal predicates, lexical meaning

1. Motivation

Symmetry, mutuality, and reciprocity represent closely related concepts, which have been widely discussed by both linguists and logicians since the 1970s, see esp. [2, 3, 4, 5] and an immense effort underlying two big collections of studies [6, 7]. In the domain of natural languages (NL), these concepts are relevant for different layers of the language description. Here, we reserve the term *mutuality* for the semantic layer and *reciprocity* for the syntactic and morphosyntactic layer. Put it differently, when we refer to the semantic feature, we use the term mutuality, while referring to a set of means encoding this semantic feature, we use the term reciprocity, as proposed, e.g., in [8].[1]

In the semantic characterization of predicates of natural languages (NL predicates henceforth), the notion of a situation plays a key role. Each NL predicate denotes a situation (i.e., a state or an action) characterized by a set of participants and relationships between these participants. The situation denoted by the predicate can be syntactically structured in various ways. According to Haspelmath [8]: "A *mutual situation* can be defined as a situation with two or more participants $(A, B, \ldots)$ in which for at least two of the participants A and B,

the relation between A and B is the same as the relation between B and A."

As attested cross-linguistically, most mutual situations are explicitly expressed by a specific morphosyntactic pattern, usually referred to as *reciprocal constructions*, where mutuality affects two syntactic positions (as exemplified in (1a) and (2a,b); compare them with the non-reciprocal patterns used in (1b) and (2c)). Morphosyntactically, reciprocal constructions are characterized by the pluralization of the subject position where both participants in the mutual relation are expressed[2] and typically by the presence of an anaphoric expression coreferring with the expression in the subject (as the expression *each other* in English (1a) and the reflexive personal pronoun *se/si/sebe/sobě/sebou* or the bipartite expression *jeden – druhý* in Czech, see examples (2a) and (2b), respectively).

(1)   a. *Aisha and Pedro **pinched** each other.* ([8])
      b. *Aisha **pinched** Pedro.*

(2)   a. *Dva doplavou současně, začnou spolu zuřivě zápasit, **štípat** se a navzájem se topit.* (SYN v10)[3]
      b. *Dva doplavou současně, začnou spolu zuřivě zápasit, **štípat** jeden druhého a navzájem se topit.*
      'The two swim up at the same time, and begin to wrestle furiously, **pinch** each other and drown each other.'
      c. … *plavec A **štípá** plavce B, …*
      '… the swimmer A **pinches** the swimmer B, …'

However, we can observe that some NL predicates express mutuality between two of their participants without any overt morphosyntactic marking. For example, sentence (3a) expresses that *Evka* 'Eve' and *jeden Angličan* 'one of the Englishmen' are in the mutual relation, 'they

[1]Some authors, however, subsume all these concepts under the term *reciprocity*, which is used for both meaning and forms expressing this meaning. Others use the term *symmetry* instead, esp. in the realm of formal semantics [9, 1]; here we avoid this term (as possible) since natural language predicates rarely denote fully symmetric situations, as illustrated below.

[2]Less frequently, the object position is involved, as, e.g., in example (4) below.

[3]SYN refers to the Czech National Corpus, https://www.korpus.cz/. Examples without sources are made-up, illustrating alternative syntactic structures.

play together / against each other', even though there is no overt reciprocal marking; the mutual interpretation is supported by the fact that (3a) implies reciprocal construction (3b). Similarly, sentence (4a) expresses the mutual relation between *humor* 'humor' and *drsné scény* 'harsh scenes' ('they alternate each other') without the presence of reciprocal marking, compare (4a) with reciprocal construction (4b). Typological studies have revealed that – despite not being numerous – such predicates appear most likely in all natural languages [10]. We will call them *inherently reciprocal predicates* here [11, 12].[4]

(3) a. *Spatřil jsem Evku v hedvábných bílých plavkách, jak* **hraje** *ping-pong proti jednomu Angličanovi a druhý jim soudcuje.* (SYN v10, modified)
'I saw Evka in a silk white swimsuit **playing** ping-pong against one of the Englishmen and the other judging them.'
b. *Spatřil jsem Evku a jednoho Angličana, jak proti sobě* **hrají** *ping-pong a druhý jim soudcuje.*
'I saw Evka and one of the Englishmen **playing** ping-pong against each other and the other judging them.'

(4) a. *A stejně tak neváhá bleskurychle* **střídat** *humor s velmi drsnými scénami, …* (SYN v10)
'And he doesn't hesitate to alternate humor with very harsh scenes at lightning speed, …'
b. *A stejně tak neváhá bleskurychle* **střídat** *humor a velmi drsné scény, …*
'And he doesn't hesitate to alternate humor and very harsh scenes with each other at lightning speed, …'

(5) a. *Avšak každé válce* **předcházejí** *manévry, …* (SYN v10)
'However, every war is preceded by maneuvers, …'
b. **Válka a manévry se vzájemně* **předcházejí***.*
'*The war and maneuvers precede each other.'

As a result, NL predicates fall into three different groups with respect to mutuality, as shown in Figure 1: on the first level, we can distinguish those predicates that can express mutuality (as the verb *štípat* 'pinch' in (1), (2), the verb *hrát* 'play' in (3), and the verb *střídat* 'alternate' in (4)) and those that cannot. The latter can be exemplified, e.g., by the verb *předcházet* 'to precede', compare (5a) and (5b). Those predicates that can express mutuality further split into those that express mutuality only in reciprocal constructions (exemplified by the verb *štípat* 'pinch' in (1)) and those that beside reciprocal constructions create constructions expressing mutuality without explicit morphosyntactic marking, referred here to as inherently reciprocal predicates (as illustrated by the verb *hrát (proti někomu)* in (3) and the verb *střídat* in (4)).

Distinguishing the three groups of NL predicates with respect to mutuality is not an end in itself: it has been
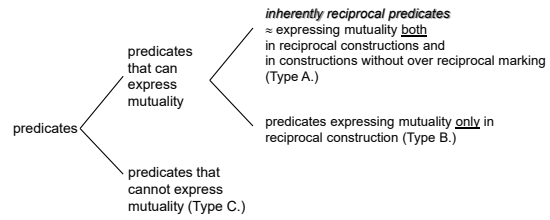

Figure 1: Types of predicates with respect to the possibility of expressing mutuality

shown that predicates intuitively classified as inherently reciprocal ones require a less degree of linguistic marking in reciprocal constructions, see esp. [13] and for Czech [14]. Thus the 'inherently reciprocal' feature appears to be a syntactically relevant semantic feature, and as such, it should be captured in a syntactic lexicon.

There is a commonly cited definition of predicates expressing mutuality, adopted from formal semantics; we discuss it in Section 2. We argue that this definition is fully satisfied only by reciprocal constructions. In contrast, inherently reciprocal predicates in constructions without overt reciprocal marking, although they express mutuality as well, does not reliably meet this criterion, as discussed in Section 3.[5] As a result, based on this definition, an inventory of NL predicates expressing mutuality can be established – but it is not capable to single out those predicates that are inherently reciprocal from this inventory. To identify inherently reciprocal predicates, we thus propose a modified version of the given criterion, on the basis of which we introduce more subtle classification of predicates expressing the relation of mutuality (Section 4). Lastly, we introduce how this classification may be applied in a syntactic lexicon, namely in the valency lexicon VALLEX (Section 5).

2. Reciprocal (Symmetric) Predicates in Formal Semantics

A formal definition of reciprocity can be found in a number of studies from formal semantics, one of the most often cited ones is given in [2]. Here the following *condition of strong reciprocity* for the so-called elementary reciprocal sentences ARr is introduced (A denotes a set of cardinality at least 2, R is a relation on $A \times A$, and r is a reciprocal element, e.g., *each other*):

$$(\forall x, y \in A)\ (x \neq y \rightarrow R(x, y)) \qquad (*)$$

Thus, as paraphrased in [4], for specific substitutions of values a and b ($a, b \in A$) for the variables x and y:

---

[4]The terms *(inherently) symmetric(al) predicates* (as, e.g., in [4, 1]) or *lexical reciprocals* [6] are also used for the same type of predicates.

[5]This paper follows the study [15], where an interested reader can find a more detailed linguistic observations.

$R(a, b) \leftrightarrow R(b, a)$.

This condition is satisfied, e.g., by sentence (6) with A identifying a set of *people in the house*, R being the relation denoted by the binary predicate *to know* (i.e., $know(X, Y) = X$ *knows* Y), and r being the reciprocal element *each other*. In Czech, the role of the reciprocal element is taken on by the reflexive pronoun, as *se* in (2a) and *sobě* in (3b), or by the bipartite expression *jeden – druhý* 'each other', as in (2b); all sentences (2a), (2b) and (3b) represent reciprocal constructions, see Section 1, and fulfill the criterion (*).

(6) *People in this house **know** each other.* ([5])

(7) *John **met** Mary at the station.* ([4])

Despite the prerequisite of the presence of reciprocal marker r, some reciprocal constructions without such marker satisfy this condition as well, as (4b). In these reciprocal constructions, the pluralized subject or direct object, in which both participants involved in mutuality are expressed, is a sufficient marker of the mutual relation between participants.

However, as exemplified in (3a), (4a), and (7), inherent reciprocal predicates can express mutuality not only in reciprocal constructions but also in constructions without any overt morphosyntactic marking (i.e., without the pluralized subject or direct object and without the reflexive pronoun or the expression *jeden – druhý*). Distinguishing inherently reciprocal predicates thus requires such a criterion that identifies mutuality of participants also in the constructions that are not overtly marked.

As the first step, we adopt the concept of a mutual situation, as proposed in [8], see Section 1, and relate it to a predicate. We will say that *predicate P with participants a and b* satisfies the *condition of mutuality* if and only if the situation denoted by the predicate involves (at least) two different participants and for the values a, b of these participants, the following equivalence holds:

$$P(a, b) \leftrightarrow P(b, a) \qquad (**)$$

The condition (**) now covers also (4a) as we can consider this construction and the construction with swapped participants (i.e., the pairs *střídat humor s velmi drsnými scénami* 'to alternate very harsh scenes with humor' and *střídat velmi drsné scény s humorem* 'to alternate humor with very harsh scenes') as paraphrases with the same truth conditions.

However, the situation is complicated by the fact that in many cases constructions of inherently reciprocal predicates without overt reciprocal marking show a certain asymmetry between participants, as pointed out by some authors, see esp. [16, 17, 4, 12]. This asymmetry can be exemplified by the pairs in (8), where only (8a) with *Radotín* in subject is fully acceptable. In such cases, the condition (**) can be hardly applied. While König and Kokutani

[4, p. 273] relate this asymmetry to "power, control, initiative, or involvement", Panevová [16] stresses the role of homogeneity of the involved participants when discussing (8).

(8) a. *Radotín **se sloučil** s Prahou před 30 lety.* ([16])
'Radotín (a small city near Prague) merged with Prague 30 years ago.'
b. ?? *Praha **se sloučila** s Radotínem před 30 lety.* ([16])
?? 'Praha merged with Radotín 30 years ago.'

3. Source of Asymmetry with NL Predicates

Gleitman at al. [17] conducted an extensive study of the asymmetry in constructions of inherently reciprocal predicates (symmetrical in the authors' terminology, e.g. *similar, equal, meet, near*). The series of psycholinguistic experiments revealed that experimental subjects interpret the pairs of sentences with swapped participants as, e.g., (9a) and (9b), in a different way, although they assess the respective predicates as symmetrical, i.e., bearing mutuality in their meaning (inherently reciprocal in our terminology). The results of their study thus revealed a paradoxical situation when inherently reciprocal predicates create constructions with the asymmetrical interpretation. Consequently, these constructions do not met the condition (**).

As the asymmetry manifests itself just in constructions of inherently reciprocal predicates without overt reciprocal marking (i.e., in constructions with the affected participants distributed into separate syntactic positions, as in (3a) or (7)), the authors [17] put forward the hypothesis that it is the *asymmetry of syntactic constructions* which causes the asymmetric interpretation of inherently reciprocal predicates. In particular, the syntactic position of participants (i.e., their distribution in the subject and object positions) imposes their interpretation as either *Figure* (*Variant*) or *Ground* (*Referent*): the subject position determines the status of a participant as *Figure* while object positions as *Ground*.

For example, in (9a) with the inherently reciprocal predicate *similar*, expressing comparison of two entities, *North Korea* in subject is interpreted as *Figure*, i.e., the compared entity, and *China* in the object position as *Ground*, i.e., the more prominent entity to which the former one is compared. With swapped participants in (9b), their interpretation with respect to the *Figure/Ground* distinction is reversed, which underlies interpretive differences between (9a) and (9b). The offered analysis – that asymmetry of (9a) and (9b) is brought about by the asymmetric syntactic structuring of the sentences – is also supported by the fact that the asymmetry disappears in constructions with both participants structured in the same way, i.e., in the single subject position, as in (9c).

(9) a. *North Korea is **similar** to Red China.* ([17, p. 322])
     b. *Red China is **similar** to North Korea.* ([17, p. 322])
     c. *North Korea and Red China are **similar** to each other.*
        ([17, p. 326])

The same interpretive differences between constructions with swapped participants formed by inherently reciprocal predicates are attested in Czech as well, as illustrated, e.g., by predicates denoting comparison, see examples (10a) and (10b) with the adjective *srovnávaný*, and space relations, see examples (11a) and (11b) with the verb *sousedit*, and by action predicates, see examples (12a) and (12b) with the verb *setkat se*. In all these examples, the difference between sentences a. and b. can be explained on the basis of the Figure/Ground interpretation of the affected participants, implied by their syntactic positions in the sentences.

(10) a. *Galský Taranis je "hromovládce", **srovnávaný** Římany s Jupiterem.* (SYN v10)
         'The Gallic Taranis is the "thunderlord", compared by the Romans to Jupiter.'
      b. *Jupiter je "hromovládce", **srovnávaný** Římany s galským Taranisem.*
         'Jupiter is the "thunderlord", compared by the Romans to the Gallic Taranis.'

(11) a. *Nevelká stavba … přímo **sousedí** s domem Le Corbusierova bratra Alberta Jeannereta a jeho rodiny.* (SYN v10)
         'The small building … is directly adjacent to the house of Le Corbusier's brother Albert Jeanneret and his family.'
      b. *Dům Le Corbusierova bratra Alberta Jeannereta a jeho rodiny … přímo **sousedí** s nevelkou stavbou.*
         'The house of Le Corbusier's brother Albert Jeanneret and his family … is directly adjacent to the small building.'

(12) a. *Krátce před smrtí **se setkal** s Elizabeth Stoneovou, …* (SYN v10)
         'He met Elizabeth Stone shortly before his death, …'
      b. *Krátce před jeho smrtí **se** s ním **setkala** Elizabeth Stoneová, …*
         'Elizabeth Stone met him shortly before his death, …'

Gleitman et al. [17] limited their attention to constructions of those inherently reciprocal adjectives and verbs where the subject position is involved in mutuality. However, similar interpretive differences can be observed also in constructions of those inherently reciprocal predicates where the participants in the mutual relation are distributed in two object positions, as illustrated by examples (4) above and (13).

Again, the interpretive difference between (13a) and (13b) can be accounted for by the Figure/Ground distinction: namely, the direct object position is associated with the Figure interpretation and the indirect object in the form of the prepositional case *od*+genitive with the Ground interpretation.

(13) a. *… a kat … jednou ranou **oddělil** jeho hlavu od těla.* (SYN v10)
         '… and the executioner separated his head from his body with a single blow.'
      b. *… a kat jednou ranou **oddělil** jeho tělo od hlavy.*
         '… and the executioner separated his body from his head with a single blow.'

Moreover, in constructions of inherently reciprocal predicates with participants distributed in different syntactic positions, the asymmetry between participants can be further stressed by context (e.g., by an adverbial modifying the verb), and thus the mutual relation between the involved participants can be even blocked. For example, although the verb *bojovat* 'to fight' can be considered as an inherently reciprocal verb in all examples in (14), only (14d) with the involved participants structured in the same position of the (plural) subject is fully symmetrical. While (14b) and (14c) are more or less exchangeable in most contexts, the modal verb *chtít* 'to want' in (14a) introduces asymmetry to the construction.

(14) a. *… tento mladíček tvrdí, že by chtěl **bojovat** s Goliášem.* (SYN v10)
         '… … this young man claims he would like to fight Goliath'
      b. *… tento mladíček bude **bojovat** s Goliášem.*
         '… this young man will fight Goliath.'
      c. *… Goliáš bude **bojovat** s tímto mladíčkem.*
         '… Goliath will fight this young man.'
      d. *… tento mladíček a Goliáš spolu budou **bojovat**.*
         '… this young man and Goliath will fight together.'

To summarize, although inherently reciprocal predicates are supposed to carry the feature of mutuality between two of their participants in their lexical meaning (and thus their mutual interpretation should not depend on special syntactic constructions), structuring these participants in different syntactic positions results in the asymmetry, which is manifested by a meaning shift when the affected participants are interchanged in the involved positions. Put it differently, "symmetry is a property of lexical items and has no special syntax", in terms of [17], constructional properties then bring about lesser or bigger asymmetry. As a result, criterion (**) relying on the preservation of truth conditions when the affected participants permuted cannot be used for identification of inherently reciprocal predicates. Otherwise, it would lead to an inescapable conclusion that there are no inherently reciprocal predicates at all, contradicting the generally accepted hypothesis.

4. Revised Approaches to Symmetrical Predicates

The usually cited condition of strong reciprocity (*) [4] takes this property as a property of the given predicate, i.e., it should be apply to all instances of this predicate – to any lexical choice of the affected participants, in any syntactic construction, in any context.[6] As such, it is too strong for classification of NL predicates. On the other hand, the condition of mutuality (**), inspired by [8], is applied to a predicate with a particular lexical choice of the affected participants (i.e., with a particular choice of their values in [4] and (*)), that is, to the particular instances of the predicate. As such, it is too weak, and hence not helpful in classifying NL predicates with respect to the feature of mutuality in their lexical meaning. Neither of these criterion in isolation is thus suitable for distinguishing the set of inherently reciprocal predicates.

4.1. The Concept of Symmetry As Graded Property: Symmetrical Instances

The problem with possible asymmetry of predicates intuitively classified as inherently reciprocal predicates is addressed by Partee [18] and Gleitman and Partee [1]. The authors show that the usual linguistic test indicating "symmetrical" predicates,[7] the logical definition, and judgments offered by native speakers are often in contradiction. Gleitman and Partee [1] thus propose to consider – in addition to the relations satisfying the condition of strong reciprocity (*) as a property of the whole relation R, which must be valid for all instances/values of x, y – also relations symmetrical only for some instances:

- A *symmetrical instance of a relation R* is a pair a, b such that $R(a, b)$ & $R(b, a)$.
- An *asymmetrical instance of a relation R* is a pair a, b such that $R(a, b)$ & $\neg R(b, a)$.

Based on this consideration, we can then ask whether, for a given predicate P, there is any instance a, b of its participants such that P and a, b satisfy the following condition (†):

$$P(a, b) \ \& \ P(b, a) \tag{†}$$

So similarly to (**), the condition (†) makes is possible to consider a predicate together with a particular choice of its participants involved in mutuality. The difference lies in the fact that (†) generalizes over individual triplets $P(a, b)$ and examines thus the property of the predicate P itself (instead of assessing individual instances in isolation).

In opposition to the previous approaches, where symmetry and asymmetry are treated as sharp concepts (and thus reciprocal predicates must be symmetrical in all their occurrences), in [18, 1] symmetry is treated as a graded property. Still, the authors distinguish four distinct groups of predicates:

(i) predicates expressing mutuality for all instances of participants ('purely symmetric predicates' in their terminology), e.g., *meet, similar, sibling*;

(ii) predicates expressing mutuality, which, however, can be blocked ('mixed symmetric predicates' in their terminology; there are both symmetric and asymmetric instances of the given predicates), e.g., *kiss, opposed to, friend*;

(iii) predicates not expressing mutuality but enabling symmetric instances ('mixed asymmetric predicates' in their terminology), e.g., *drawn, kill, hit*;

(iv) predicates asymmetric for all their instances ('purely asymmetric predicates'), e.g., *contain, father, below*.

Predicates intuitively understood as inherently reciprocal should fall under the first two types of predicates in the above given classification. However, the existence of 'purely symmetric predicates' seems to be questionable since for each of these predicates, one can typically find contexts in which mutuality between the affected participants is canceled.

4.2. Unary-Collective Predicates And Their Binary Counterparts

An interesting approach to the concept of predicates expressing mutuality can be found in [19] – Winter points out that reciprocity as a linguistic phenomenon is often confused with symmetry as a concept belonging to the domain of logic. To avoid this, he proposes to start (as in [1]) with those binary predicates that have also the so-called unary-collective forms (illustrated by examples as *A and B dated / are identical / are cousins*.)[8] and compare

---

[6]Though some authors point out that this condition is fully true only for reciprocal constructions, see esp. [4] who refer to the predicates satisfying this condition as to symmetric predicates: "Perfect symmetry is only expressed by reciprocal constructions and this symmetry is often iconically signalled by the fact that the relevant semantic arguments are encoded by the same grammatical relation." [4, p. 273].

[7]The authors have the so-called Litmus Test in mind, examining pairs of constructions like *John and Bill are similar/match/hug* and **John is similar/match/hug* where the constructions with plural subject should express, roughly speaking, the mutual relation between John and Bill.
We can see certain limitation here as (like in other logic-oriented works) the authors do not distinguish between particular constructions with a predicate and the predicate as an abstract unit bearing some lexical properties as such (regardless of different syntactic construction it can create).

[8]Based on the provided examples, the unary-collective forms of predicates correspond to those that satisfy the Litmus Test, see footnote 7; i.e., they have plural subject and they express the mutual relation between participants in the subject position.

them to their basic forms (i.e., to the forms illustrated by *A dated B / A is identical to B / A is B's cousin*.). The author observes that for predicates that are symmetric from the logical point of view (i.e., predicates with interchangeable arguments, cf. condition (*)), these two types of constructions can serve as paraphrases with the same meaning (contrary to asymmetric predicates). For example, in (16) with the asymmetric predicate *talk to*, the first sentence "can be interpreted reciprocally, but also distributively: *Dan talked, and Sue talked as well.*" [19]; the two constructions cannot be thus assessed as paraphrases (contrary to all the sentences in (15) which have only the reciprocal interpretation).

(15)   *Sue and Dan dated.* ↔ *Sue dated Dan.*
$\qquad\qquad$ (↔ *Dan dated Sue.*)

(16)   *Sue and Dan talked.*
$\qquad$ ↮ *Sue talked to Dan.* & *Dan talked to Sue.*

Inspired by this observation, the author define the criterion of *plain symmetry* (‡), which is applied to an unary-collective predicates P over sums of (singular) entities in E (with cardinality 2 (or more)) and a binary predicate R alternating with P, ranging over pairs of entities in E:

$$\forall x, y \in E, x \neq y : \atop P(x+y) \leftrightarrow R(x,y) \text{ \& } R(y,x) \qquad (\ddagger)$$

In other words, Winter limits the requirement of symmetry only to constructions logically equivalent to specific constructions with plural subject and mutual meaning – the predicate R is not necessarily symmetric in all its instances. The proposed criterion serves as another interesting approach addressing the problem of the discussed inadequacy of the logic-based condition (*).

Winter applies the condition (‡) to English (and to a small set of other languages like Hebrew). However, it is not clear how to adapt such approach to typologically different languages. For example, Czech attests that predicates intuitively classified as inherently reciprocal predicates typically form constructions parallel to those considered as unary-collective ones, as, e.g., *diskutovat (s někým)* 'discuss with somebody', which, however, can be interpreted distributively as well, compare (17a) and (17b).

(17)   a. ... *během malování portrétu Masaryka* **diskutovali** *malíř a prezident i o Komenském* ... (SYN v10)
'... during the painting of Masaryk's portrait, the painter and the president also discussed Comenius ...'
b. *Britové a Němci* **diskutují** *o veřejné službě.* (SYN v10)
'British and Germans discuss about public service.'

5. Inherently Reciprocal Predicates in Lexicographic Practice

Let us repeat that inherently reciprocal predicates are characterized by the possibility to express mutuality between participants in constructions that are not overtly marked, see esp. examples (3) and (4) in Section 1. However, the mutuality condition (**) is met only by some instances of these predicates, as we have seen in Section 3. The existence of the instances violating this condition leads to the conclusion that – contrary to linguistic intuition – natural languages do not have any inherently reciprocal predicates. This well known limitation inspired researchers to seek for a weaker but reliable criterion, as discussed in Section 4, making it possible to examine not only behavior of predicates in individual constructions but (i) abstract from concrete syntactic constructions and (ii) relax the requirement of symmetry to individual instances of predicates, as in [1, 19]. Only such a criterion is applicable in lexicographic description, which takes a predicate as a language unit representing all its syntactic constructions.

These considerations led us to define *inherently reciprocal predicates* as such predicates for which there are attested the instances of constructions expressing mutuality without overt reciprocal marking. This approach is based on the following observation:

Criterion. If for a given predicate there is (even a single) *example* where *mutuality is expressed in the construction that is not overtly marked* then the feature of mutuality must be already contained in the lexical meaning of the given predicate (at least as a potential feature) and the predicate thus comes under the class of inherently reciprocal predicates.

To put it differently, the criterion abstracts from properties brought about by specific morphosyntactic constructions (constructions with overt reciprocal marking); instead, unlike [1], it examines lexical properties of examined predicates themselves.

This approach has been employed in the VALLEX lexicon[9] [20], where three types of verbs are distinguished with respect to reciprocity:

A. inherently reciprocal predicates, i.e., predicates bearing the feature of mutuality in their lexical meaning, as defined in the previous paragraph (e.g., *bojovat* 'to fight', *diskutovat* 'to discuss', and *kombinovat* 'to combine'); this type comprises predicates that typically fall under (i)-(ii) in the taxonomy defined in [1], i.e., predicates expressing mutuality for at least some of their instances even without overt reciprocal marking, see Section 4.1;

---

[9]https://ufal.mff.cuni.cz/vallex/4.5/

Table 1
Frequency of individual types of predicates in VALLEX

VALLEX		lemmas	lexical units	lexemes
Type A.	inherently reciprocals predicates	441	338	288
Type B.	mutuality just in syntactical reciprocal constructions	2.813	2.450	1.697
Type C.	predicates not allowing to express mutuality	3.400	4.113	2.009
TOTAL		4.667	6.869	2.773

B. predicates allowing to express mutuality only if structured in reciprocal constructions, as in (2a) (e.g., *děkovat* 'to thank sbd', *dotknout se* 'to touch', and *všímat si* 'to pay attention'); this type more or less corresponds to type (iii) in [1];

C. predicates not allowing to express mutuality (e.g., *předcházet* 'to precede', *bolet* 'to ache; to hurt'); this type corresponds to type (iv) in [1].

Figure 1 provides basic statistics on individual types of predicates in VALLEX.

6. Conclusion

While typological studies have revealed that inherently reciprocal predicates (i.e., predicates bearing the feature of mutuality in their lexical meaning) appear most likely in all natural languages, available formal criteria striving to define such predicates are not satisfactory as they are either too strict (applied to the whole predicate in its all instances) or too weak (applied only to individual instances of a predicate) (as exemplified on Czech predicates). In this paper, we have thus proposed the modified version of such criteria. The proposed criterion abstracts from particular syntactic constructions of examined predicates (and from features brought about by these constructions). Thus it allows us to focus on the features contained already in their lexical meaning. Based on this criterion we have introduced a more subtle classification of predicates expressing the relation of mutuality. This classification has been applied in the valency lexicon VALLEX.

Acknowledgment

References

[1] L. R. Gleitman, B. H. Partee, Understanding Symmetrical Predicates, 2022. (Talk presented at the Fred Jelinek Seminar Series, Institute of Formal and applied Linguistics).

[2] D. T. Langendoen, The logic of reciprocity, Linguistic Inquiry 9 (1978) 177–197.

[3] M. Dalrymple, M. Kanazawa, Y. Kim, S. McHombo, S. Peters, Reciprocal expressions and the concept of reciprocity, Linguistics and Philosophy 21 (1998) 159–210. doi:10.1023/a:1005330227480.

[4] E. König, S. Kokutani, Towards a typology of reciprocal constructions: focus on German and Japanese, Linguistics 44 (2006) 271–302. doi:10.1515/LING.2006.010.

[5] E. König, V. Gast, Reciprocity and reflexivity – description, typology and theory, in: E. König, V. Gast (Eds.), Reciprocals and Reflexives: Theoretical and Typological Explorations, Mouton de Gruyter, Berlin – New York, 2008, pp. 1–32.

[6] V. P. Nedjalkov (Ed.), Reciprocal Constructions, John Benjamins Publishing Company, Amsterdam – Philadelphia, 2007.

[7] E. König, V. Gast (Eds.), Reciprocals and Reflexives: Theoretical and Typological Explorations, Mouton de Gruyter, Berlin – New York, 2008.

[8] M. Haspelmath, Further remarks on reciprocal constructions, in: V. P. Nedjalkov (Ed.), Reciprocal Constructions, John Benjamins, Amsterdam – Philadelphia, 2007, pp. 2087–2115.

[9] L. R. Gleitman, B. H. Partee, Symmetry and Symmetrical Predicates, 2020. (UMass Blog, updated handout).

[10] J. P. Knjazev, Lexical reciprocals as a means of expressing reciprocal situations, in: V. P. Nedjalkov (Ed.), Reciprocal Constructions, John Benjamins, Amsterdam – Philadelphia, 2007, pp. 115–146. doi:10.1075/tsl.71.07knj.

[11] J. Panevová, Znovu o reciprocitě, Slovo a slovesnost 68 (2007) 91–100.

[12] G. Rákosi, The inherently reflexive and the inherently reciprocal predicate in Hungarian: Each to their own argument structure, in: E. König, V. Gast (Eds.), Reciprocals and Reflexives: Theo-

retical and Typological Explorations, Mouton de Gruyter, Berlin – New York, 2008, pp. 411–450. doi:10.1515/9783110199147.411.

[13] S. Kemmer, The Middle Voice, John Benjamins, Amsterdam/Philadelphia, 1993.

[14] V. Kettnerová, M. Lopatková, Ke způsobům vyjádření vzájemnosti v češtině, Slovo a slovesnost 81 (2020) 243–268.

[15] V. Kettnerová, M. Lopatková, Proč má ježek bodliny přilepené k tělu, ale nemá tělo přilepené k bodlinám? K charakteristice inherentně recipročních predikátů (Towards characteristics of inherently reciprocal predicates), in: Vzťahy v jazyku – jazyk vo vzťahoch, submitted, pp. 1–11.

[16] J. Panevová, Česká reciproční zájmena a slovesná valence, Slovo a slovesnost 60 (1999) 269–275.

[17] L. R. Gleitman, H. Gleitman, C. Miller, R. Ostrin, Similar, and similar concepts, Cognition 58 (1996) 321–376. doi:10.1016/0010-0277(95)00686-9.

[18] B. H. Partee, Symmetry and symmetrical predicates, in: A. E. Kibrik, V. I. Belikov, B. V. Dobrov, B. V. Dobrovolsky (Eds.), Computational linguistics and intellectual technologies: Papers from the international conference "Dialogue", Institut Problem Informatiki, Moscow, 2008, p. 606–611.

[19] Y. Winter, Symmetric predicates and the semantics of reciprocal alternations, Semantics and Pragmatics 11 (2018) 1–47 (early access). doi:10.3765/sp.11.1.

[20] M. Lopatková, V. Kettnerová, E. Bejček, A. Vernerová, Z. Žabokrtský, Valenční slovník českých sloves VALLEX, Nakladatelství Karolinum, Praha, 2016.