Irreducible symmetry in reciprocal constructions

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1. Introduction

A reciprocal sentence typically describes a multitude of elementary relationships between its participants. For example, sentence (1) describes a situation involving several kicks, each involving a single kicker and a single person being kicked.

(1) *They kicked each other.*

Considerable attention has been devoted to characterizing the kinds of situations that can be truthfully described by a reciprocal sentence; a number of studies have formulated answers in the form of one or more *reciprocal situation schemas,* or situation types, which specify the properties that a situation must meet in order to be describable by a reciprocal (Langendoen 1978; Langendoen and Magloire 2002; Lichtenberk 1985, 1999; Dalrymple et al. 1998; Winter 1996, 2001, a.o.) Well-known situation schemas include *strong reciprocity* (all pairings of individual members of the set denoted by the subject must stand in the predicated relationship), *weak reciprocity* (each individual member of the subject must participate in the predicated relationship as initiator and as endpoint), and several others.

Such schemas are expressed in terms of conditions on the entire set of elementary relations comprising a reciprocal situation; we can describe them as *cumulative* conditions. But as we will see below, certain important properties of reciprocals are sensitive to properties of each of the elementary relations (events) described by the underlying predicate, rather than of the aggregate situation: In particular, a number of phenomena in various languages are conditioned on whether the individual events described by a predicate are *irreducibly symmetric* (Dimitriadis 2004, 2008). For example, some languages have reciprocal strategies that can only describe events that are irreducibly symmetric.[1]

An irreducibly symmetric predicate, in short, is one that can only describe individual events that are themselves symmetric for the two participants involved. This notion is explained in the following section. Irreducible sym-

metry plays an important role in several other constructions, as we will see in Sections 3 through 5; in this paper we are particularly concerned with its role in various properties of reciprocals. In Section 6, we examine in more detail the role of participants in the events described, and argue that despite some apparent asymmetries, the reciprocal relation should be characterized as symmetric.

Section 7 takes up the relationship between irreducible symmetry and reciprocal situation schemas. It will be shown that the parameter of irreducible symmetry is orthogonal to the basic inventory of cumulative situation schemas. In other words, event-level symmetry needs to be considered independently of the basic situation graph. In some cases this suggests a reduction in the number of basic situation schemas that can be identified; but it also suggests a systematic distinction that is not usually made. Strong reciprocity, for example, will be distinguished from strong reciprocity with irreducible symmetry, even though both are described by the same (traditional) situation graph. However, there need only be one basic "strong reciprocity" schema, which may or may not occur in combination with irreducible symmetry.

2. Symmetry, reciprocity and irreducible symmetry

While the notions of reciprocity and symmetry are sometimes used interchangeably, I will use the former term for a syntactic construction and the latter for a logical relation. The two are not co-extensive: It is easy to find reciprocal sentences that do not describe a symmetric relation, or vice versa.

In the sense used here, a reciprocal must necessarily involve application of a morphosyntactic device or other construction, the *reciprocal strategy*, to a verb.[2] A reciprocal strategy, of course, must have a particular kind of semantic content: i.e., it must confer reciprocal meaning. I will not further define what is meant by "reciprocal meaning", since there is no doubt that the constructions under discussion here qualify as reciprocal strategies. It is enough to state that a reciprocal strategy must apply to a predicate of at least two arguments, with the semantic result that some set of participants act on each other as initiators and endpoints of the indicated relation, in the particular way that we recognize as reciprocal. (Some of the works on characterizing reciprocal semantics, based on an inventory of situation schemas and/or prototype situations, were cited in the Introduction; see also König and Kokutani 2006).

A simple, underived verb by itself cannot, by this definition, count as reciprocal: only a reciprocal strategy can create a reciprocal predicate. However, we allow in principle for *reciprocal deponents* ("frozen" reciprocal verbs with no corresponding transitive form, i.e., whose base verb only occurs in the reciprocalized form), and for morphologically null reciprocalization as in English. This requirement for (formal) reciprocal marking is not universally embraced by other authors working on reciprocals. In particular, it is at variance with Rákosi (this volume), who treats as reciprocals symmetric verbs in Hungarian with no formal reciprocal marking. While I believe that there are sound reasons for restricting the category *reciprocal* to constructions with some sort of formal marking, the question is beyond the scope of the present work.

By definition, a two-place predicate is *symmetric* if exchanging its two arguments always preserves truth values; so *X met Y* is symmetric, but *X saw Y* is not (since X might see Y without Y seeing X). Reciprocals can in general be formed from either type of predicate:

(2) a. *The boys met each other.*
    b. *The boys saw each other.*

If a reciprocal sentence involves just two participants, it will (in the usual case)[3] express a symmetric relationship between them: each stands as both initiator and endpoint of the activity described. If a predicate is symmetric when restricted to some set, we say that it is symmetric *on* that set; so if John and Mary saw each other, we say that *see* is symmetric *on* the set consisting of John and Mary. (The term "symmetric" with no qualification is reserved for predicates that are symmetric on any set they are applied to). If multiple participants are involved, sentence (2b) can be truthfully used to describe situations that are not symmetric; in a suitable context, this sentence is true just if for each participant there is some event of seeing and some event of being seen (weak reciprocity).[4] In other words, if everyone saw one or more other persons, and was seen by one or more persons; but *not necessarily* the same ones. Hence *see* is not a symmetric predicate. Note that this situation schema was stated at the level of the aggregate situation.

In such contexts sentence (2b) describes a plurality of events, each of which might be an event of asymmetric seeing; but such a state of affairs is not possible with events of meeting: even in contexts where weak reciprocity is sufficient, i.e., where it is enough for A to meet *some* others and to be met

by some others, the semantics of *meet* are such that any event of A meeting B must also be an event of B meeting A.[5]

Even in situations involving just two participants, the two sentences are distinguished at the level of the individual events comprising the reciprocal situation: Sentence (a) may describe two separate events of non-symmetric seeing; the boys might have seen each other singing on stage, on separate occasions. But there can be no event of John meeting Bill without that *same* event also being an event of Bill meeting John. I will refer to events that have this property as *(irreducibly) symmetric events,* and to predicates that are only true of symmetric events as *irreducibly symmetric predicates.* We summarize the definition as follows:

(3) **Definition.** A predicate is *irreducibly symmetric* if (a) it expresses a binary relationship, but (b) its two arguments have necessarily identical participation in any event described by the predicate.[6]

It must be understood that the requirement of "identical participation" is restricted to the core activity or state represented by an event. This is generally necessary for symmetric linguistic predicates (as opposed to logical relations): Even with a prototypically symmetric event such as meeting, the participants may be involved in different ways and to different extents: One participant, but not another, may have initiated the meeting, arrived early, provided the refreshments, etc. Only the narrow fact of meeting involves symmetric participation. This issue will be further discussed in Section 6.

While irreducible symmetry of a predicate is thus logically independent of reciprocity, numerous languages have reciprocal strategies that affect the symmetry properties of the predicates they apply to (in addition to making them reciprocal). This is commonly illustrated with the verb *kiss.* A kiss can be given by one person to another, who may or may not give a kiss in return. But there are also kisses, e.g., on the lips, in which both participants are symmetrically involved. The transitive verb *kiss* can describe either type of kissing, as can reciprocals formed with *each other* or with its Greek equivalent, shown in (4a). This might refer to one or more symmetric kisses, or to a series of asymmetric kisses: on the hand, cheek, or top of the head. But the reciprocal construction shown in (b), which involves a verbal suffix with reciprocal meaning,[7] can only refer to one or more kisses with symmetric participation, i.e., on the lips.

(4) Greek[8]

a. *O Yanis kje i Maria filisan o enas ton alo.*
the John and the Maria kissed the one the other
'John and Maria kissed each other' (Symmetric or non-symmetric)

b. *O Yanis kje i Maria filithikan.*
the John and the Maria kissed-RECP
'John and Maria kissed' (Symmetric only)

The same holds for so-called "covert reciprocals" in English, i.e., symmetric transitive verbs such as *meet, kiss* and *marry,* which are interpreted reciprocally when used intransitively with a plural subject; I will assume, following Reinhart and Siloni (2005), that such covert reciprocals are derived from transitive verbs through a morphologically null reciprocalization operation. It is well-known that covert reciprocals are irreducibly symmetric (Gleitman et al. 1996; Schwarzschild 1996), hence the contrast in example (4) is also present in its English translation.

While the verb *see* is not symmetric, its semantics are not incompatible with symmetry: for some pairs of persons X and Y, it may well be true that X saw Y and Y saw X. Such predicates are called *non-symmetric.* If, in a certain situation, the sentence *the boys saw each other* expresses a symmetric relationship over the set of boys, we can say that *see* is symmetric *on* that set of boys; but it is not a symmetric predicate (without qualification).[9]

Other predicates, such as *precede, follow,* etc., cannot be symmetrically true (on a single occasion) of any pair of participants: If A precedes B, B cannot at the same time precede A. Such relations are formally known as *asymmetric.*

At the level of relations, then, we have a three-way distinction: a relation can be symmetric, asymmetric, or non-symmetric (neutral). But at the level of events there are only two possibilities: a predicate is either limited to irreducibly symmetric events, or it is not. An irreducibly symmetric predicate will necessarily encode a symmetric relation, but a predicate that is not irreducibly symmetric might, depending on the circumstances, encode a symmetric, asymmetric or non-symmetric relation.

Even if a predicate always encodes a symmetric relation, it does not follow that it is irreducibly symmetric: The reciprocal predicate "X and Y saw each other", for example, is symmetric on the X and Y positions, since these can be exchanged without loss of truth (the same is true of almost any predicate with a conjoined subject). But this predicate does not involve symmetric events. It should be added that irreducible symmetry must not be conflated with si-

multaneity of the reciprocal relationship, either; in Section 4.3 we discuss examples of reciprocal relations that hold simultaneously and symmetrically on a set (e.g., with stative verbs), but will be shown not to be irreducibly symmetric.

To forestall confusion, I will avoid referring to reciprocal predicates as "symmetric" unless the underlying events are irreducibly symmetric. I will also use the shorthand "non-symmetric" for reciprocals that are *not* irreducibly symmetric (instead of the awkward "not-irreducibly-symmetric").

Having defined irreducibly symmetric events, we now turn to showing that they are a linguistically meaningful category. This is accomplished by presenting three linguistic phenomena that are sensitive to the parameter of irreducible symmetry. These are: the semantics of certain reciprocal strategies; the use of the discontinuous reciprocal construction; and the *absence* of certain event-counting ambiguities.

3. Symmetric and non-symmetric reciprocal strategies

3.1. Obligatorily symmetric strategies

The most obvious role of irreducible symmetry is as an obligatory property of certain reciprocal strategies. Greek, Hebrew and Hungarian have reciprocals of this type; let's call them *obligatorily symmetric* reciprocals for short. (Covert reciprocals in English also belong to this category, as already mentioned). While some verbs are irreducibly symmetric even when used transitively, an obligatorily symmetric strategy creates irreducibly symmetric predicates, with a greater or lesser meaning shift, even when applied to verbs that are not irreducibly symmetric in their transitive form.

Such strategies always appear to involve a verbal affix or clitic; I am aware of no argument reciprocals that are obligatorily symmetric.[10]

Each of the above languages also has an argument reciprocal strategy, allowing us to contrast the meaning of the two. In each of the following examples, the verbal reciprocal (a) can only refer to symmetric kisses, while the argument reciprocal (b) is ambiguous between symmetric and non-symmetric meaning, like the transitive verb *kiss* in English.

(5) Greek, = (4)
   a. *O Yanis kje i Maria filithikan.*
      the John and the Maria kissed-RECP
      'John and Maria kissed' (Symmetric only)
   b. *O Yanis kje i Maria filisan o enas ton alo.*
      the John and the Maria kissed the one the other
      'John and Maria kissed each other' (Symmetric or non-symmetric)

(6) Hebrew (Siloni 2001)
   a. *Hem hitnašku.*
      they kissed.RECP
      'They kissed.'
   b. *Hem nišku ze et ze / one et ha-šeni.*
      they kissed this ACC this one ACC the-second
      'They kissed each other.'

(7) English
   a. John and Mary kissed.
   b. John and Mary kissed each other.

In Hungarian, the reciprocal form of *kiss* can only denote "the sexual type of kissing where the two tongues are involved", as Rákosi (2003: 52) puts it, while the argument reciprocal can denote any kind of "intensive" kissing activity.

(8) a. *János és Kati csókol-óz-t-ak.*
      John and Kate kiss-RECP-PST-3PL
      'John and Kate were involved in a mutual sexual type of kissing'
   b. *Én és a báty-ám meg-csókol-t-uk egymás-t.*
      I and the brother-1SG PREV-kiss-PST-1PL each.other-ACC
      'I and my brother kissed each other'

It is common for some reciprocal verbs to take on idiomatic, non-compositional meanings, typically related to social interactions; in the languages under discussion these, too, are invariably irreducibly symmetric. In such cases the base verb might not even describe a symmetric or "naturally reciprocal" activity, but the reciprocal form will have all the typical properties of irreducibly symmetric reciprocals. The argument reciprocal in example (9a) can describe a series of blows, simultaneous or at different times, but sentence (9b) can only describe a physical fight. Example (10b) involves a more extreme case of non-compositionality: The verb *tsakono* 'to catch' in

its transitive form is used to mean ‘to catch someone in the act’, but its reciprocal form means ‘to argue, to have a falling-out’. Similarly the verb *diastavrono* ‘to cross (combine, interbreed two things)’ has the reciprocal form *diastavronome* ‘to cross paths’. Such behaviour is common cross-linguistically.

(9) Greek
  a. *O Yorgos kje i Maria xtipisan o enas ton alo.*
  the Yorgos and the Maria hit the one the other
  ‘Yorgos and Maria hit each other’
  b. *O Yorgos kje i Maria xtipithikan.*
  the Yorgos and the Maria hit.RECP
  ‘Yorgos and Maria came to blows (with each other)’

(10) a. *O Nikos kje o Andonis tsakosan o enas ton allo (na kimate).*
  the Nick and the Anthony caught the one the other (to sleep)
  ‘Nick and Anthony caught each other sleeping’
  b. *O Nikos kje o Andonis tsakothikan.*
  the Nick and the Anthony caught.RECP
  ‘Nick and Anthony argued’

We find the same meaning shift in Hungarian. Example (11a) might be true if John and Peter were taking turns delivering blows at each other, but example (b) denotes an activity in which “the hits cannot be seriated or even individuated in any meaningful way” (Rákosi 2003: 52).

(11) a. *János és Péter ver-t-ék egymás-t.*
  John and Peter beat-PST-3PL each.other-ACC
  ‘John and Peter were beating each other’
  b. *János és Péter ver-eked-t-ek.*
  John and Peter beat-RECP-PST-3PL
  ‘John and Peter were fighting/wrestling’

These reciprocalization strategies can only be applied to particular verbs; they are “middle strategies” in the sense of Faltz (1977) (see also Kemmer 1993), and the resulting reciprocals usually describe social interactions and other “naturally reciprocal” relationships. As is well-known, the specific inventory of middle reciprocal verbs varies from language to language; for example, it is not possible in English to form an irreducibly symmetric (covert) reciprocal from the verb *kick,* but in Greek this is allowed; the result describes a kicking match.

(12) a. * *John and Mary kicked.*
b. *O Yanis kje i Maria klotsjundan.*
the John and the Maria kicked.RECP
'John and Mary were having a kicking fight'

The fact that these are middle strategies explains how they can be restricted to irreducibly symmetric semantics; if a verb cannot be given an irreducibly symmetric meaning (possibly though a meaning shift, as above), the strategy is simply not used with it.[11]

At this point we should clarify the relation between irreducible symmetry and so-called *naturally reciprocal events.* It is well-known that there is a cross-linguistically recurrent class of verbs whose reciprocals tend to receive special encoding in many languages, i.e., to be formed through a middle reciprocal strategy. It has been observed that such verbs describe activities, particularly social interactions, that are either necessarily or very frequently carried out reciprocally. I will reserve the term *naturally reciprocal events* for events belonging to this core class. But while the verbs in this core group are frequently irreducibly symmetric in meaning, the two notions are not coextensive. For example, the transitive verb *to kiss* does not denote an irreducibly symmetric activity; but kissing is a "naturally reciprocal" activity by our definition, since kissing verbs belong to the core semantic class of verbs that tend to form middle reciprocals. (The symmetry of the resulting middle-reciprocal *kiss* is a separate matter.) This distinction is not always made explicit.[12]

3.2. Other kinds of strategies

A number of languages have verbal reciprocals that, while not obligatorily symmetric, nevertheless introduce the semantics of irreducible symmetry with *some* verbs that they apply to. Let's call these strategies *optionally symmetric.* Such a strategy may apply to all, or almost all transitive verbs in its language, but it only imposes irreducibly symmetric semantics on some of them. German, French, Serbian, Lao, Swahili and Chicheŵa, among others, have reciprocals of this type. The (b) examples below either require or strongly favor symmetric kisses, while the (a) examples, which involve argument reciprocals, once again do not introduce an irreducibly symmetric meaning.

(13) French

a. *Jean et Marie se sont embrassés l'un l'autre.*
John and Mary RECP were kissed each other
'John and Mary kissed each other'
b. *Jean et Marie se sont embrassés.*
John and Mary RECP were kissed
'John and Mary kissed'

(14) German (Kemmer 1993: 112)
a. Hans und Maria haben einander geküßt.
b. Hans und Maria haben sich geküßt.

In other cases, the resulting reciprocal does not have an irreducibly symmetric interpretation. In German, for example, the verbal reciprocal *sich* can be used with the verb *vergöttern* 'to idolize'. Idolizing is evidently not a naturally reciprocal activity, at least as far as German is concerned, and example (15) does not have irreducibly symmetric meaning.

(15) *Johann und Maria vergöttern sich.*
Johann and Maria idolize REFL/RECP
'Johann and Maria idolize each other (or: themselves)'

That *vergöttern* is not irreducibly symmetric can be demonstrated by syntactic tests, as shown in Section 4.2.

It can be seen that German *sich,* French *se,* and analogous optionally symmetric strategies in other languages can function in two ways: they can behave like the symmetricizing reciprocals in Greek or Hebrew, or they can generate non-symmetric reciprocals more akin to *each other* in English. While it might seem that symmetry is simply irrelevant to the application of this type of strategy, it is argued in Dimitriadis (2004) that optionally symmetric strategies are in fact ambiguous: When the resulting verb is irreducibly symmetric, it has all the properties associated with obligatorily symmetric reciprocal strategies; when it is not, it has a complementary cluster of properties associated with what Reinhart and Siloni (2005) describe as reciprocal formation "in the syntax". We could say, therefore, that there are two distinct ways of applying such a strategy, of which only one imposes irreducibly symmetric semantics.

Besides the obligatorily and optionally symmetric strategies, there are reciprocal types that do not introduce irreducibly symmetric semantics when they apply. Even some of these show a sensitivity to the factor of irreducible symmetry, usually by being incompatible with it. For example, the Serbian argument reciprocal *jedan drugog* 'each other' cannot be applied to verbs

with irreducibly symmetric meaning; the verbal reciprocal *se* must be used instead.[13]

(16) a. * *Petar i Marko su sreli jedan drugog.*
Peter and Marko AUX met each other
'Peter and Marko met each other'
b. *Petar i Marko su se sreli.*
Peter and Marko AUX RECP met
'Peter and Marko met'

Similarly, Rothmayr (2004) reports that the reciprocal *sich gegenseitig* is (at least in some dialects of German) incompatible with inherently symmetric verbs:

(17) a. *weil die Toni und die Irmi einander treffen/umarmen.*
'because Tony and Irmi meet/embrace each other.'
b. ? *weil die Toni und die Irmi sich gegenseitig treffen/umarmen.*
'because Toni and Irmi meet/embrace each other.'

Conversely, *sich* by itself (without *gegenseitig*) cannot be used with verbs whose meaning *excludes* symmetric situations:[14]

(18) *Die Kinder folgten einander/*sich ins Zimmer.*
'The children followed each other into the room.'

German thus appears to exclusively assign the two ends of the symmetry spectrum, irreducibly symmetric and asymmetric verbs, to distinct verbal reciprocal strategies. The middle ground, those verbs that may or may not be symmetrically true in a situation, are compatible with either form; and the entire range is compatible with the argument reciprocal *einander.*

These effects appear to be idiosyncracies of the various strategies, since they are language-particular; for example, *einander* and *each other* can be used with irreducibly symmetric verbs like *meet,* unlike their Serbian counterpart; and in contrast to *sich,* the French verbal reciprocal *se* can be used with asymmetric predicates:

(19) *Les enfants se sont suivi.*
the children RECP are followed
'The children followed each other'

It can be seen that many reciprocal strategies are sensitive, in diverse ways, to the parameter of irreducible symmetry or to symmetry in general. But oth-

ers, such as *each other* in English, can be described without reference to irreducible symmetry.[15]

4. Discontinuous reciprocals

4.1. The construction

Alongside ordinary reciprocals, many languages allow the *discontinuous reciprocal construction,* in which the logical subject of a reciprocal verb appears to be split between the syntactic subject and a *comitative argument.* In those languages that have subject-verb agreement, the verb typically agrees with the syntactic subject alone.[16]

(20) Greek
  a. *O Giannis kje i Maria filithikan*
     the John and the Maria kissed-RECP.PL
     'John and Maria kissed each other'
  b. *O Giannis filithike me ti Maria*
     the John kissed-RECP.SG with the Maria
     'John and Maria kissed each other'

(21) Hebrew (Siloni 2001)
  a. *Hem hitnašku*
     they kissed.RECP
     'They kissed'
  b. *Hu hitnašek im Dina*
     he kissed.RECP with Dina

(22) Swahili (Vitale 1981: 145)
  a. *Juma na Pili wa-na-pend-an-a.*
     Juma and Pili SM.PL-PRES-love-RECP-FV
     'Juma and Pili love each other'
  b. *Juma a-na-pend-an-a na Pili.*
     Juma SM.SG-PRES-love-RECP-FV with Pili
     'Juma and Pili love each other.

(23) German
  a. *Johann und Maria schlugen sich.*
     Johann and Maria hit RECP
     'Johann and Maria fought/hit each other'

b. *Johann schlug sich mit Maria*
Johann hit RECP with Maria
'Johann and Maria fought/hit each other'

As we will see, discontinuous reciprocals are intimately connected with irreducible symmetry in their distribution. In this section we summarize the analysis proposed in Dimitriadis (2004, 2008), as it applies to the question of irreducible symmetry.

The discontinuous reciprocal is a construction specific to certain reciprocal-forming strategies; it is possible with *sich* in German, with *se* in Serbian, and with the Greek verbal reciprocal shown above, but not with the "argument" reciprocals of the same languages. In fact, it seems to be restricted to verbal reciprocals; of the many languages discussed in Dimitriadis (2004) that have the discontinuous construction, none allow it with argument reciprocals.[17]

We can add to our list of discontinuous reciprocals the covert reciprocals of English, many of which can be used discontinuously. Again, the construction is not possible with the argument reciprocal *each other.*

(24) a. *John met/argued/talked/collided with Mary.*
b. * *John met each other with Mary.*

Because covert reciprocals are not morphologically marked, however, it is impossible to know when reciprocalization has applied and when we have an underived verb with sufficiently similar semantics. For this reason the English facts must be approached with caution, and are not used as grounds for any conclusions in this work.

It is common to analyze discontinuous reciprocals by reducing them to the corresponding "simple reciprocal" sentences, either by deriving the former from the latter via syntactic movement or at the level of interpretation (Vitale 1981; Mchombo and Ngunga 1994; Siloni 2001). However, it is shown in Dimitriadis (2004) that the semantics of discontinuous reciprocals is more specific, that is, more expressive, than the semantics of the corresponding simple reciprocals, and consequently the meaning of a discontinuous reciprocal cannot be derived from that of its simple counterpart. To see this, we can consider discontinuous examples in which either the syntactic subject or the comitative argument is plural.

(25) Greek
   a. *O Yanis, o Nikos kje i Maria tsakothikan*
      the John the Nick and the Maria argued.RECP
      'John, Nick and Maria argued'
   b. *O Yanis kje o Nikos tsakothikan me ti Maria*
      the John and the Nick argued.RECP with the Maria
      'John and Nick argued with Maria'

Example (25a) describes a situation of conflict between the three members of the subject, with no specification of which party or parties were in conflict with whom. But (25b) is either about an argument between John and Nick on the one part and Maria on the other, or possibly about two different arguments between Maria and each of the two men. In each case, the reciprocal relation must involve pairs consisting of one participant (possibly plural) from the syntactic subject, and one participant from the comitative argument. Although the simple reciprocal sentence (a) could also have been used to describe this situation, it could not refer *only* to these possibilities; the meaning of (b) is therefore more specific than that of (a), and is not semantically reducible to it. More generally: The meaning of the discontinuous reciprocal is not reducible to the meaning of the corresponding simple reciprocal. To express the meaning of (b) it is necessary to treat the two positions, subject and comitative, as distinct arguments of the verb at both the syntactic and the syntactic level. In other words, discontinuous reciprocals must be analyzed as two-place predicates. The issue is not further defended here, as it does not directly impact on the questions at hand.[18]

4.2. The role of symmetry

In a great number of languages, irreducible symmetry plays a prominent role in the distribution of discontinuous reciprocals. Specifically, the discontinuous construction can only be used with reciprocal verbs that are irreducibly symmetric in meaning. For the obligatorily symmetric strategies, this means simply that the discontinuous construction is potentially available with all reciprocal verbs, since the reciprocal strategy itself can only be used if the result is irreducibly symmetric.[19] The real test of this prediction is found with "optionally symmetric" strategies. In Serbian, for example, the reciprocal form of *kiss* can be used discontinuously, with irreducibly symmetric semantics,

while the (non-symmetric) reciprocal of *hear* cannot; however, the latter verb *can* be used discontinuously with the symmetric, lexicalized meaning *to talk to each other.* Other verbs that allow the reciprocal *se* but cannot be used discontinuously are *help, praise,* etc. Note that it is the symmetry of the derived (reciprocal) form that matters, not of the basic transitive verb; neither *kiss* nor *hear* are symmetric in their transitive form.

(26) Serbian
  a. *Jovan i Marija se ljube.*
  John and Mary.NOM RECP kiss
  'John and Mary kissed'
  b. *Jovan se ljubi sa Marijom.*
  Jovan.NOM RECP kisses with Marija.INST
  'John and Mary kiss'

(27) a. *Jovan i Marija se čuju.*
  Jovan and Marija.NOM RECP hear.3PL
  'John and Mary hear each other'
  b. * *Jovan se čuje sa Marijom.*
  Jovan RECP hears with Marija.INST
  (Ok with secondary meaning: 'John and Maria talk [to each other]')

Similarly, most verbs in German can form a *sich* reciprocal; but while *sich schlagen* 'to fight' and *sich küssen* 'to kiss' can be used discontinuously, non-symmetric *sich vergöttern* 'to idolize each other' cannot.

(23) a. *Johann und Maria schlugen sich.*
  Johann and Maria hit RECP/REFL
  'Johann and Maria hit each other/themselves'
  b. *Johann schlug sich mit Maria*
  Johann hit RECP/*REFL with Maria
  'Johann and Maria hit each other/*themselves'[20]

(28) a. *Hans versteht sich mit Maria.*
  Hans understands RECP with Maria
  'Hans and Maria understand each other'
  b. *Hans verträgt sich mit Maria.*
  Hans gets.along RECP with Maria
  'Hans and Maria get along'

(29) a. *Johann und Maria vergöttern sich.*
Johann and Maria idolize REFL/RECP
'Johann and Maria idolize themselves/each other'
b. * *Johann vergöttert sich mit Maria.*

(30) a. * *Hans mag sich mit Maria.*
Hans likes RECP with Maria
'Hans and Maria like each other'
b. * *Hans haßt sich mit Maria.*
Hans hates RECP with Maria
'Hans and Maria hate each other'

For an example outside the European language area we turn to Lao (Enfield 2003). The primary reciprocal strategy of Lao, the particle *kan3,* can be combined with any transitive verb, as shown by (31a) below. But the discontinuous reciprocal construction is only possible with the usual irreducibly symmetric verbs, as examples (31b) and (31c) show.

(31) a. *bak2-dèèng3 kap2 bak2-sèèng3 hên3/vaw4/tii3/khaa5 kan3*
Deng with Seng see/speak/hit/kill RECP
'Deng and Seng saw/spoke.to/hit/killed each other'
b. *bak2-dèèng3 vaw4/tii3 kan3 kap2 bak2-sèèng3*
Deng speak/hit RECP with Seng
'Deng spoke.to/fought (reciprocally) with Seng'
c. * *bak2-dèèng3 hên3/khaa5 kan3 kap2 bak2-sèèng3*
Deng saw/killed RECP with Seng
* 'Deng and Seng saw/killed each other'

Thus, irreducibly symmetric meaning correlates closely with the ability to be used discontinuously.

Returning briefly to "obligatorily symmetric" reciprocal strategies, recall that such a strategy can itself only be used if the result is irreducibly symmetric, and hence the prediction is that if a verb can be reciprocalized, it can also be used discontinuously. This is not logically necessary, since the discontinuous construction might be blocked for other reasons; but for the most part, I have not found significant restrictions on its availability. For example, the Greek verbs *eklego* 'elect', *proslavmano* 'hire', and *didasko* 'teach' cannot form this type of verbal reciprocal at all; but *sinando* 'meet', *sproxno* 'push' and *tilefonao* 'telephone' all have irreducibly symmetric verbal reciprocals, and all can be used discontinuously.

(32) Greek
  a. *O Nikos kje o Andonis tsakothikan.*
     the Nick and the Anthony caught.RECP
     'Nick and Anthony argued'
  b. *O Nikos tsakothike me ton Andoni.*
     the Nick caught.RECP with the Anthony
     'Nick got in an argument with Anthony'

(33) Hungarian
  a. *János és Kati csókol-óz-t-ak.*
     John and Kate kiss-RECP-PST-3PL
     'John and Kate were kissing'
  b. *János csókol-óz-ott Kati-val.*
     John kiss-RECP-PST Kate-with
     'John and Kate were kissing'

A notable exception to this generally good correlation is English, since some covert reciprocals do not allow the discontinuous construction as expected. For example, *John kissed/married with Mary* is not very good. But since there is no visible exponent of a reciprocalization operation, it is not clear what we should make of this observation.

In both types of strategies considered above, the discontinuous construction is restricted to predicates that are irreducibly symmetric. But it should be mentioned here that this correlation does not hold universally. The Bantu languages Swahili, Chicheŵa and Ciyao allow the discontinuous reciprocal construction, but irreducible symmetry is not required. The following is a classic example of a "chained reciprocal", in which the relationship holding between participants is asymmetric.

(34) Swahili (Johnson et al. 1939: 99)
  Ugonjwa hu-fuat-ana na upotevu wa maisha.
  sickness SM-follow-RECP with waste of life
  'Sickness follows from a life of profligacy'

4.3. On simultaneity

The participants of an irreducibly symmetric event, such as *John and Mary kissed,* play dual roles: each of them is both kisser and kissed. In his discussion of reciprocal situations, Lichtenberk (1985) treats such events as ex-

pressing a pair of relations, just like for an ordinary reciprocal situation. The difference is that for symmetric events, the two component relations are necessarily simultaneous. But not all situations involving simultaneous events are irreducibly symmetric, and hence it is possible to tease the two factors apart. Reciprocal stative predicates, which hold simultaneously even if the underlying events are not irreducibly symmetric, provide our test case.

The following examples, all of which involve stative predicates, differ in their compatibility with the discontinuous construction. Those in (35) describe a state of mutual communication or compatibility, which can only hold symmetrically between participants, and are well-formed discontinuous reciprocals. Those in (36) describe psychological states that are directed from one person to another, i.e., that are not irreducibly symmetric (although reciprocated); and they are ungrammatical when used discontinuously.

(35) a. *Hans versteht sich mit Maria.*
'Hans and Maria understand each other'
b. *Hans verträgt sich mit Maria.*
'Hans and Maria get along'

(36) a. * *Hans mag sich mit Maria.*
'Hans and Maria like each other'
b. * *Hans haßt sich mit Maria.*
'Hans and Maria hate each other'

We conclude that discontinuous reciprocals are indeed sensitive to irreducible symmetry, rather than to the simultaneity of relations that characterizes symmetric events.[21]

5. Counting symmetric events

Sentences with plural subjects are frequently ambiguous between distributive and cumulative interpretations (*inter alia*). As Siloni (2002, this volume) points out, this ambiguity is absent in certain examples involving verbal reciprocals. While Siloni proposes a morphologically-based account of this effect, we will see here that it is a direct consequence of irreducible symmetry.[22]

In example (37a), the count "five times" can be understood as counting either the total number of kicks or the kicks delivered by each of John and Mary. Exactly the same ambiguity is found with the argument reciprocal in (37b). The irreducibly symmetric sentence (37c), however, can only be about

five kicking occasions (each involving an indeterminate, and irrelevant, number of kicks).

(37) a. *O Yanis kje i Maria klotsisan ti bala pende fores.*
the John and the Mary kicked the ball five times
i. John and Mary kicked the ball; there were a total of five kicks, all together.
ii. John kicked the ball five times; Mary kicked the ball five times. There were a total of ten kicks.

(38) a. *O Yanis kje i Maria klotsisan o enas ton alo pende fores.*
the John and the Mary kicked the one the other five times
i. John and Mary kicked each other; there were a total of five kicks, all together.
ii. John kicked Mary five times; Mary kicked John five times. There were a total of ten kicks.

b. *O Yanis kje i Maria klotsithikan pende fores.*
the John and the Mary kicked.RECP five times
i. John and Mary kicked each other. There were a total of five kicks, or five kicking matches, all together.

The same effect is found in Hebrew and in English:

(39) Hebrew (Siloni 2002)

a. *Dan ve-Ron nišku exad et ha-šeni xameš pe'amim.*
Dan and-Ron kissed each ACC the-other five times
i. There were five mutual kissing events.
ii. There were ten kissing events: five by Dan and five by Ron.

b. *Dan ve-Ron hitnašku xameš pe'amim.*
Dan and-Ron kissed five times
i. There were five mutual kissing events. (symmetric only)

(40) a. *John and Mary kissed the flag / each other five times.*
i. There were five kissing events.
ii. There were ten kissing events: five by John and five by Mary.

b. *John and Mary kissed five times.*
i. There were five mutual kissing events. (symmetric only)

The source of this contrast is not the difference between verbal and argument reciprocals *per se,* but the difference between irreducibly symmetric and non-symmetric predicates: When we count asymmetric events, we can

choose between counting the total number of events or counting the number of events attributable to each participant; but when we count symmetric kisses (or symmetric altercations involving kicking), we can count them only once: the symmetric kiss given by Dan to Ron cannot be counted as distinct from a symmetric kiss given at the same moment by Ron to Dan. In other words, symmetric events are atomic as far as this test is concerned.

To see that argument reciprocals are not in themselves the reason for the ambiguous readings, it is enough to consider examples with an irreducibly symmetric base verb.

(41) a. *John and Mary met each other five times.*
   i. There was a total of five meetings.
   ii. * There was a total of ten meetings.
   b. *John and Mary met five times.*
   i. There was a total of five meetings.
   ii. * There was a total of ten meetings.

(42) *Johann und Maria trafen einander/sich fünf mal.*
Johann and Maria met each.other five times
i. There were a total of five meetings.
ii. * There were a total of ten meetings.

The contrast we found in the earlier examples has disappeared. In no case is there an ambiguity, since the resulting sentence is always irreducibly symmetric. Sentence (41a) is unambiguous even though *each other* readily gives rise to scope-like ambiguities elsewhere.

In languages that can have non-symmetric verbal reciprocals, such verbs are ambiguous. We illustrate with another example from German. The non-symmetric verbal reciprocal in (43b) behaves just like the non-symmetric argument reciprocals.

(43) German
   a. *Johann und Maria traten einander fünf mal vors Schienbein*
   Johann and Maria kicked each.other five times against.the shinbone
   i. John and Mary kicked each other. There were a total of five kicks.
   ii. John kicked Mary five times; Mary kicked John five times. There were a total of ten kicks.
   b. *Johann und Maria traten sich fünf mal vors Schienbein*
   Johann and Maria kicked each.other five times against.the shinbone
   i. John and Mary kicked each other. There were a total of five kicks.

ii. John kicked Mary five times; Mary kicked John five times. There were a total of ten kicks.

The crucial factor, then, is not the type of reciprocal but whether the events described are symmetric. A sentence about non-symmetric events is ambiguous because it can be taken to count either the actions of each participant or the total number of actions; but symmetric events cannot be counted twice (once for each participant), and so the ten-event reading is not possible.

The behaviour described in this section would not be possible if an event of meeting, or a symmetric kiss, in fact consisted of two co-occurring asymmetric events. If that were the case we should be able to add John's "portion" of several symmetric kisses, for example, to Mary's portion, and derive a cumulative reading. But as far as linguistic reference is concerned, symmetric events truly behave as a single, symmetric event, rather than as a pair of simultaneous events that entail each other.

6. How symmetric are symmetric events?

While we defined irreducibly symmetric predicates as those whose participants have an identical relationship to the event described, we have glossed over some complicating factors that we now return to. Even a prototypically symmetric event like a meeting is brought about through the varying activities and attitudes of its participants: One may have arranged the meeting, another may have gone to it early, or eagerly, etc. Such potential differences are even present with simple reciprocals like (44a), of course; but they are brought into the forefront when we consider two-place predicates involving symmetric events, such as (44b) and (44c).

(44) a. *Bill and John met.* (one-place symmetric reciprocal)
b. *Bill met John.* (irreducibly symmetric transitive)
c. *Bill met with John.* (discontinuous reciprocal)

The discontinuous reciprocal can even be used with modifiers that target the subject only (example 45); such phenomena provide evidence that the two positions are distinct arguments (Dimitriadis 2004). Clearly, we must restrict our attention to the core activity itself if we can hope to consider such events as symmetric.

(45) German (Behrens et al. 2003: 5)

Peter küsste sich gerne mit Maria.
Peter kissed.SG RECP gladly with Maria
'Peter liked to get kissing with Maria'

But while it is reasonable to exclude from consideration unstated secondary or preparatory activities, and even the contributions of adjuncts, there remain some asymmetries due to the linguistic encoding of the participants themselves. Example (44b) involves a transitive verb with irreducibly symmetric meaning (hence not a reciprocal, in our terminology). Example (44c) involves a symmetric reciprocal used discontinuously. Both predicates describe symmetric events, according to our analysis, and hence the two participants are said to have identical participation in the event in question. In fact, the two argument positions are not entirely identical. Both types of construction can be used under certain circumstances when one of the participants is credited with more initiative, agency, or importance. When there is considerable difference in the status of the participants, for example, it is often possible to use a symmetric reciprocal discontinuously where its simple recirocal form would be odd.

(46) *a. The car collided with the tree.*
b. # The car and the tree collided.
(47) a. The bicycle is near the garage.
b. # The bicycle and the garage are near each other.

In such sentences the more active participant must occupy the subject position. But this need not mean that the two arguments are thematically different. As Gleitman et al. (1996) show, there are measurable differences between the two arguments of even logically symmetric predicates like *be equal to,* due to the different syntactic prominence of the arguments. The discontinuous construction assigns unequal discourse status to the participants in a single symmetric event, a property which is no doubt exploited by speakers.

Gleitman et al. suggest that symmetrical predicates, like ordinary predicates, have a Figure-Ground structure; whichever participant appears on non-subject position becomes the Ground. Thus (48a) is odd because we do not use a moveable object to fix the location of an immoveable building; sentence (48b) is odd because the car must be the active participant in any collision scenario.

(48) a. # The garage is near the bicycle.
b. # The tree collided with the car.

In the case of comparisons, we use the Ground as the source of our standard of measurement, and could therefore get different results when the participants are reversed. Gleitman et al. point out that in similarity comparisons, the subject is understood to have some property that is characteristic of the Ground; therefore example (49a) might be understood to say that China is isolationist like North Korea, while example (b) might be saying that North Korea shares some salient property of China. Gleitman et al. show that if we explicitly include the standard of comparison, as in (50), the difference between the two versions disappears.

(49) a. China is similar to North Korea.
b. North Korea is similar to China.
c. North Korea and China are similar.
(50) a. North Korea is similar to China in size.
b. North Korea and China are similar in size.

Such contrasts are clearly non-thematic, and we can safely attribute them to structural differences between the two argument positions. They must be factored out before we can recognize a relation as symmetric.

There is also some evidence that the two positions, subject and comitative oblique, differ subtly in the degree of agency they require. It is odd to say (51a) if John forced a kiss on Mary. It is also odd to say (51b) in a situation where John walks up to a statue, embraces it, and plants a kiss on its lips: it seems that the subject position requires intentional participation in the act being described.

(51) a. # John and Mary kissed (although Mary resisted).
b. # John and the statue kissed.

While the English verb *kiss* cannot be used discontinuously, its Greek equivalent can. Many Greek speakers find (52b), the discontinuous version of (51b), to be acceptable.

(52) a. # *O Nikos kje to aghalma filithikan.*
the Nick and the statue kissed.RECP
'Nick and the statue kissed'
b. *O Nikos filithike me to aghalma.*
The Nick kissed.RECP.SG with the statue
'Nick engaged in a mutual kiss with the statue'

This is a subtle effect that does not seem to hold universally. My consultants reported the Hebrew and Serbian equivalents of (52b) to be ill-formed; György Rákosi reports that while he initially disliked the same example in Hungarian, he later came to consider (53b) well-formed.

(53) Hungarian
  a. # *János és a szobor csókol-óz-t-ak.*
  John.NOM and the statue.NOM kiss-RECP-PST-3PL
  'John and the statue kissed.'
  b. *János részegen csókol-ózo-tt a szobor-ral.*
  John.NOM drunk kiss-RECP-PST the statue-with
  'John kissed with the statue while drunk.'

There may also be clearer cases. Behrens et al. (2003) report that in Tetun Dili (East Timor), "in cases where one of the participants is presented as the instigator, the subject refers to the instigator [...] and the secondary participants are introduced by *ho* 'with"' (cited from Williams-van Klinken et al. 2002: 60–61).

(54) a. *João ho Maria istori malu.*
  John and/with Maria quarrel RECP
  'John and Maria quarreled (no indication as to who started it)'
  b. *João istori malu ho Maria.*
  John quarrel RECP and/with Maria
  'John quarreled with Maria (he started it)'

In each case, we can say that intention or "instigation" is distinguished from participation in the act itself; the subject position attributes both instigation and participation to the subject, while the comitative position only attributes participation. The activity (or state) is symmetric with respect to participation only. This argument is somewhat strained in the case of metaphorical extensions to inanimate participants, such as *John met with an untidy end.* As pointed out by Rákosi (this volume), such expressions involve discontinuous reciprocals but are not obviously symmetric in meaning.

Rákosi concludes that discontinuous reciprocals do not in fact always describe a symmetric relationship, while I have considered such contrasts to be peripheral to the core reciprocal meaning (Dimitriadis 2004). But the matter may be more than a question of which factor one considers more important: If such differences in agency and instigation count against symmetry, they should also count against reciprocity: A discontinuous reciprocal like (52b)

would not even be a reciprocal if it could not mean something like "Bill kissed the statue and the statue kissed Bill". A similar argument can be made with less exotic examples, like (55).

(52b) *O Nikos filithike me to aghalma.*
The Nick kissed.RECP.SG with the statue
'Nick engaged in a mutual kiss with the statue'

(55) *The car collided with the tree.*

Given that such discontinuous reciprocals are overtly marked as reciprocals (except in English), and generally considered to be such, we must assign to them an interpretation that allows some sort of reciprocal relation to hold—even if this relationship is not irreducibly symmetric. But any reciprocal relation must exclude considerations of agency, since agency is not in fact reciprocated between the participants: only the subject participant possesses it. And if we exclude considerations of agency, the reciprocal relation in (52b) is symmetric after all (and hence, since a single event is involved, irreducibly symmetric).

Perhaps this becomes clearer if we consider the fact that in two-participant situations, a reciprocal necessarily expresses a symmetric relationship. Therefore, a two-participant discontinuous reciprocal is either symmetric, or is not reciprocal at all. But the conclusions we draw about the two-participant case should also apply to multiple-participant reciprocals: the reciprocated relationship in discontinuous reciprocals must hold symmetrically if it is to hold reciprocally at all. Unless one is prepared to claim that many discontinuous reciprocals are not reciprocal at all (in the usual sense of the term), we must conclude that any asymmetries between the subject and comitative argument are irrelevant to our assessment of the reciprocal relation.[23]

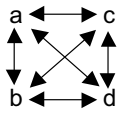
While the topic clearly merits further investigation, I assume here that the two positions are thematically identical, in the sense of having the same thematic relationship with the lexical verb; and that additional properties of the subject participant are associated with its syntactic position (thus one might take them to be introduced not by the reciprocal verb, but by another functional head).

7. Symmetry and situation types

To characterize the semantic conditions governing the use of reciprocal constructions, a number of studies have identified *reciprocal situation schemas* that describe the essential characteristics of situations that can be truthfully described by a reciprocal sentence. Such situation schemas may be described in terms of logical truth conditions (Langendoen 1978; Langendoen and Magloire 2002; Dalrymple et al. 1998), or more informally through diagrams (Lichtenberk 1985, 1999; Evans this volume). Strong reciprocity, for example, can be described by formula (56a) or by the diagram in (b); we might also explain, in words, that every pair of distinct individuals must stand in the indicated relation.

(56) a. $\forall x \in A \forall y \in A\,(x \neq y \rightarrow xRy)$

b.

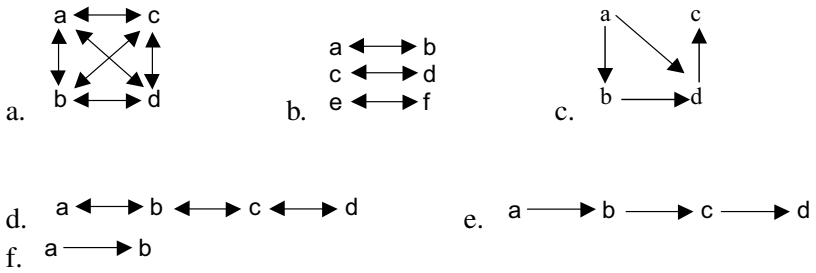


I will not attempt here to reconcile the different proposals, or choose between them; our focus will be on the relationship of irreducible symmetry to situation schemas in general.

A reciprocal situation typically involves a multitude of events, which together, *cumulatively,* must satisfy some stated relationship between their participants. Each event relates the participants occupying the two argument positions targeted by the reciprocal (e.g., Agent and Patient), and the required relationship determines the "situation type" that must characterize the situation. If all possible pairs of participants must be related, we have Strong Reciprocity; if each participant must appear on the left and on the right of some instance of the relation, we have Weak Reciprocity; etc. For example, a situation described by *The girls pushed each other* satisfies Weak Reciprocity if for each participant there is some event in which this participant was the pusher, and some event in which she was the pushed (cf. Langendoen 1978.)

Langendoen's goal was to identify, out of several situation schemas, a single one that would correctly represent the truth condition schema of ordinary reciprocals. Other studies have arrived at collections of several situation schemas that are applicable on different occasions. For concreteness we consider the situation inventory of Evans (2003):

(57)



a. Strong; b. Pairwise; c. Melee; d. Adjacent; e. Chained; f. Asymmetric

Because situation schemas are cumulative, even logically asymmetric predicates such as *defeat* can participate in reciprocal relationships if we allow a reciprocal sentence to be interpreted over multiple occasions. The following examples involve asymmetric verbs, used quite unexceptionally to describe a symmetric cumulative situation.

(58) a. John and Mary have defeated each other in chess many times before (and they never came to blows before).
b. They have all visited each other many times.

If we restrict the context to a single occasion, of course, this will not be possible. An asymmetric relation can then only conform to the melee, chained, or asymmetric situation types.

In contrast to the situation schemas, irreducible symmetry is a property of individual events; we can only determine whether an irreducibly symmetric reciprocal can truthfully describe a situation if we know whether each event, by itself, is irreducibly symmetric. Put differently, irreducible symmetry is a relationship that must hold between the participants of each individual event, not cumulatively between all participants to events in a situation. Diagram (56b) cannot tell us whether a situation is irreducibly symmetric; it uses a double-headed arrow between two participants, call them *a* and *b*, to indicate that the relationships *aRb* and *bRa* hold; but it does not tell us whether they hold by virtue of a single event or different ones.[24] To bring out this distinction, I will use two directed arrows in such cases; a double arrow is reserved for an irreducibly symmetric relation. Accordingly, sentence (59a) is represented by diagram (60a); sentence (59b) by diagram (60b).

(59) a. John and Mary kissed each other.
b. John and Mary kissed.

(60) *a.* $J \leftrightarrows M$ *b.* $J \leftrightarrow M$

Because irreducible symmetry concerns the individual events rather than the cumulative situation schema, it is compatible with any cumulative situation type that is not explicitly asymmetric; for example, diagram (61a) shows a "pairwise" situation consisting of three symmetric events. The pairwise relation could also have been satisfied, preserving the same pairing, by six non-symmetric events as shown in (b). The diagrams might represent three fixed couples, who exchange a total of three symmetric kisses vs. three pairs of asymmetric kisses.

(61)

a. $a_1 \leftrightarrow b_1$
$a_2 \leftrightarrow b_2$
$a_3 \leftrightarrow b_3$

b. $a_1 \rightleftarrows b_1$
$a_2 \rightleftarrows b_2$
$a_3 \rightleftarrows b_3$

Note also that since a strongly reciprocal situation requires every pair of participants to be related, strongly reciprocal relations are *always* symmetric (since it follows that any two participants will be related in both directions).[25] Irreducible symmetry is an additional, independent consideration.

Chaining situations are typically illustrated with asymmetric predicates such as *follow.* Such predicates are obviously incompatible with irreducible symmetry. But as example (63) shows, irreducibly symmetric predicates can also be chain-like: the graph of both relationships is a long line with each participant being related only to its immediate neighbours, asymmetrically in example (62) but irreducibly symmetrically in (63). The latter is the "adjacent" situation in Evans's classification, which is also compatible with non-symmetric predicates (i.e., predicates that are neither asymmetric nor irreducibly symmetric), as example (64) shows.[26]

(62) a. *The children followed each other into the room.*
b. $\ldots a_1 \rightarrow a_2 \rightarrow a_3 \rightarrow \ldots$

(63) a. *The players are sitting alongside each other on the bench.*
b. $\ldots a_1 \leftrightarrow a_2 \leftrightarrow a_3 \leftrightarrow \ldots$

(64) a. *The guards on the Great Wall can barely see each other.*
b. $\ldots a_1 \leftrightarrows a_2 \leftrightarrows a_3 \leftrightarrows \ldots$

We similarly find irreducibly symmetric, asymmetric or neutral (non-symmetric) examples of melee reciprocals:

(65) *a. The bumper cars were colliding with each other.* (irr. symmetric)
b. The fish killed each other. (asymmetric)
c. The boys were kicking each other. (non-symmetric)

Thus, irreducibly symmetric predicates can freely co-occur with any situation schema that does not logically exclude them, demonstrating that event symmetry is fundamentally independent of the cumulative situation schema.

8. Conclusions

Irreducibly symmetric relations play an important role, both in our conceptualization of situations and in the syntactic or semantic behaviour of various constructions. A few of them were discussed in this paper. I have tried to show that irreducible symmetry must be considered an autonomous characteristic of our conceptualization of certain event types; we have seen that it cannot be reduced to simultaneity, or to any "cumulative" property of a situation as a whole. It is also not purely extensional: Two-person reciprocals always describe a relation that is logically symmetric on these two persons (except in the very restricted case of the asymmetric situation type), but irreducibly symmetric predicates are nevertheless distinguished from ordinary, non-symmetric predicates.

Reciprocal situation types are "cumulative" in the above sense: they characterize a property of the aggregate relation, not of each constituent event. The two levels of description are distinct, although they interact in non-trivial ways as shown in Section 7.

It should be underscored that irreducible symmetry is a property of our *conceptualization* of a situation or activity, not a property of the situation itself. For example, a conversation normally consists of two people speaking in turns, with one person talking and the other listening; but verbs like *talk* (and suitable counterparts in other languages) conceptualize this activity as an event involving symmetric participation.[27] Similarly, a physical altercation may consist of a series of physical blows, each delivered by one person on another; but we can conceptualize it as the irreducibly symmetric activity "fighting", and refer to it with the corresponding symmetric verbs. The same can even be said for events of meeting, since these are carried out through a series of acts that are not themselves irreducibly symmetric (as discussed in Section 6); it is our focus on the symmetric aspects of a meeting that renders it an irreducibly symmetric activity.

Symmetry need not always be linked to reciprocity.[28] It is easy to find examples of symmetric predicates that have no evidence of being reciprocal-marked (although languages differ in how frequently they allow this). Gleit-

man et al. (1996) point out that the equivalent of the simple/discontinuous reciprocal alternation is seen in English with other kinds of symmetric predicates:

(66) *a. Bees and wasps are similar.*
b. Bees are similar to wasps.

Siloni (2002) and Rákosi (2003) make the same point on the basis of Hebrew and Hungarian examples. Such examples abound cross-linguistically, and their study could help distinguish those properties of reciprocals that are due to symmetry in general (cumulative or irreducible), from those that are linked to other aspects of reciprocal semantics or syntax. Plank (2006), for example, proposes that the German discontinuous construction was primarily available for symmetric intransitives, and that the discontinuous reciprocals cited above are formed by analogic extension. The present work, however, has focused on sorting out the role of symmetry in reciprocal contexts.

Chapter 1
Notes

. I am grateful to Tanya Reinhart, Ekkehard König, Tal Siloni, György Rákosi and Marijana Marelj for their comments and suggestions, and to Ahmed Shariff, Damian George, Marika Lekakou, Tanja Milićev, Patrick Brandt, Roland Pfau, and Kristina Riedel for language judgements on Swahili, Greek, Serbian, and German. Additional examples are drawn from internet searches and various print sources.

1. A reciprocal strategy is some particular, language-specific grammatical device used to encode a reciprocal relationship between participants (cf. Dimitriadis and Everaert (2004)). Thus *einander, sich* and *sich gegenseitig* are exponents of distinct reciprocal strategies of German. Lichtenberk (1985) uses the term *reciprocal construction* for the same notion. The term "irreducible symmetry" is my own. I have adopted it in order to distinguish this property of events from related concepts such as general symmetry (a property of two-place relations), "naturally reciprocal events" (a cross-linguistically recurrent class of events that are typically carried out reciprocally, see Section 3.1), inherently symmetric predicates (i.e., underived), etc.
2. We should more properly say "to a verb or nominal", or perhaps "to a (syntactic) predicate". While I do not mean to imply that nominal reciprocalization should be excluded from the domain of the term "reciprocal", in this work I will be exclusively concerned with reciprocals in the verbal domain, and suppress discussion of reciprocal nouns or adjectives.
3. The exceptions involve examples such as *The children followed each other into the room,* which are briefly discussed in Section 7.
4. The term *event* is used in the "neo-Davidsonian" sense introduced by Parsons (1990). An event represents an occurrence or state of affairs in the real world, or rather, in our conceptualization of it. A sentence like *John ran* is about an event of running, in the same sense that it is about the individual named John; and a given event can be described or referred to in multiple ways, just like an individual can.
5. The discussion assumes the weak reciprocity situation type. Strong reciprocity obscures the distinction under discussion, because (for reasons explained in Section 7) there is no difference in the strongly reciprocal situation schemas applicable to *see* and *must*; in that case the two kinds of event are still distinguishable at the level of individual events, as described in the text for the two-participant case.
6. In this paper I take an informal view on what constitutes an "event". Certain formalizations of events, the "eventualities" of Parsons (1990) among them, do not allow the same thematic role to be assigned to two distinct participants. This is not directly compatible with our definition of irreducibly symmetric events as involving two arguments with "identical participation". A formalization in the context of a Parsonean theory of events is proposed in Dimitriadis (2008).
7. The exponent of reciprocalization in example (4b) is in fact ordinary passive morphology; passive marking in Greek may, depending on the particular verb and on the context, confer a passive, reflexive, reciprocal, or middle interpretation.

8. The following non-transparent glosses are used in this paper: FV final vowel, INST instrumental case, PREV preverb, PST past tense, SM subject marker. In the interest of clarity, markers that are formally ambiguous between reflexive and reciprocal meaning are glossed simply as RECP, except when the reflexive meaning is relevant.
9. For *see* to be symmetric on a set of boys, it is required that for any pair of boys A and B, either A saw B *and* B saw A, or neither saw the other. This can easily be false for some reciprocal situations, as already discussed; it can also be true of non-reciprocal situations: if no boy saw anyone else, for example, the situation is not reciprocal but the relation *see* is symmetric on that set.
10. A reciprocal strategy is considered "verbal" if it functions syntactically as an intransitivizing operator, rather than as an argument of the verb. In some cases, the proper classification of a strategy may not be immediately clear. German *sich* is a particularly subtle case; it can be characterized as a weak pronoun, hence as an argument. But a number of interpretive properties, particularly the fact that it is subject-oriented, suggest that it is a verbal operator rather than a simple anaphoric pronoun. Reinhart and Siloni (2005) argue that reflexive *sich* is a verbal operator when locally bound, but an argument reflexive when used as a long-distance anaphor. Accordingly, I will consider *sich* a verbal operator.
11. Note again that it is the resulting reciprocal, not the underlying verb, that has irreducibly symmetric semantics. The underlying verb need not even be related to social interaction (but the resulting reciprocal will be).
12. Kemmer (1993: 102) defines naturally reciprocal events as "events that are either necessarily (e.g., *meet*) or else very frequently (e.g., *fight, kiss*) semantically reciprocal"; but her use of the term may be closer to what is here called irreducibly symmetric events.
13. The distribution of *jedan drugog* is more complicated than alluded to above; while it cannot be used with symmetric two-place predicates, including verbs like *meet* and symmetric *se*-reciprocals, it *can* be added to collective predicates (which are also marked with *se,* and imply identical participation of the participants). In such cases it seems to confer a distributive interpretation.

    (i) *Kola su se sudarila jedna s drugim.*
    cars AUX SE collided each with other
    'The cars collided with each other [several separate collisions]'

    These effects were addressed in the talk *Symmetric and non-symmetric reciprocals in Serbo-Croatian,* presented by Alexis Dimitriadis and Tanja Milićev at the conference *Formal Descriptions of Slavic Languages 6.5* (Nova Gorica, December 2006).
14. Sentence (i), called to my attention by Ekkehard König (personal communication), is an exception to this generalization. Many speakers of German find it unnaceptable, however.

    (i) *% Heute jagen sich wieder einmal die Termine.*
    today chase RECP again the deadlines
    'Today appointments are chasing each other.'

15. A reviewer points out that *each other* is optional, and relatively rare, with symmetric predicates. In this sense, its distribution *is* influenced by the parameter of symmetry. Nevertheless the semantic contribution of *each other,* and the requirements for its successful use, can be stated without reference to the symmetry of the underlying predicate.
16. Volker Gast (personal communication) points out that some languages systematically allow plural agreement in clauses, reciprocal or non-reciprocal, that contain a comitative

("surrogate agreement"). This is the case, for example, in Tzotzil (Aissen 1987: 183); the phenomenon is also found in Greek, particularly with first or second person subjects. In such cases, discontinuous reciprocals can trigger plural agreement like ordinary comitatives.

17. For evidence that *se* and *sich* are verbal reciprocals, see Zec (1985), Reinhart and Siloni (2005), and the discussion in Dimitriadis (2004).
18. For discussion of the argument structure of discontinuous reciprocals, see Dimitriadis (2004) and Rákosi (this volume).
19. Although obligatorily symmetric reciprocals automatically satisfy the symmetry requirement for discontinuous reciprocal formation, the discontinous construction might still be blocked for other reasons.
20. This sentence also has an irrelevant instrumental reading, which says that Johann used Maria as a club to hit himself.
21. This reinforces Lichtenberk's (1985) conclusion that "the contrast between sequentiality and simultaneity of the relations in reciprocal situations is of no consequence to reciprocal constructions" (p. 24).
22. Siloni's account is discussed in more detail in Dimitriadis (2008).
23. It must be acknowledged that, as Rákosi (personal communication) points out, I have not adopted a criterion for what qualifies as a reciprocal situation (cf. Section 2); and therefore it cannot be stated with certainty that a non-symmetric construal of a discontinuous reciprocal would not fall within it.
24. This is not necessarily a shortcoming. Lichtenberk (1985) writes: "I prefer to view situations as made up of relations [...] rather than as made up of events (or states). Viewing situations in this way will enable us to say that even though a situation may consist of a single event, it is nevertheless made up of two relations in which each of the participants plays two roles" (p. 20).
    The focus of situation schemas, then, is on relations by design. But in the present context it is useful to explicitly consider both relations and events.
25. The converse is not true: If John and Mary like each other but they neither like nor are liked by Bill, the relationship is symmetric but does not satisfy strong reciprocity. (See also fn. 9).

    (i) John $\leftrightarrows$ Mary

        Bill

26. The predicate *see* is non-symmetric, since one can see someone else without being seen; and it is not irreducibly symmetric, of course. But the relation is symmetric on the set of guards, since any adjacent pair can see each other in this example.
27. The example is due to Ekkehard König.
28. The force of this statement depends on just how "reciprocity" is defined; cf. Section 2.

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