The event structure of irreducibly symmetric reciprocals

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It is often said that reciprocals express a "symmetric" relationship between participants. This is true in the sense that if a reciprocal sentence involves just two participants, it will (in the usual case) express a symmetric relationship between them: each stands as both originator and receiver of *some event* of the type described. But if we focus on the individual events comprising a reciprocal situation, we find that there is a distinction between the following reciprocal sentences:

(1)   a.   The boys saw each other.
        b.   The boys met (each other).

A sentence like (1a) describes a plurality of events, each of which might be an event of asymmetric seeing: the reciprocal predicate is true just if for each boy there is some event of seeing and some event of being seen. These events may well involve different co-participants.[1] Such a state of affairs is not possible with events of meeting: There can be no event of John meeting Mary without Mary meeting John at the same time. I will argue that we can in fact make a stronger claim: That we can say, in a linguistically meaningful sense, that there can be no event of John meeting Mary without that *same* event also being an event of Mary meeting John. I will refer to events of this type as *symmetric events,* and to predicates that can only be symmetrically true of their participants as *irreducibly symmetric predicates.*

It is well-known that so-called "covert reciprocals" in English are irreducibly symmetric in this sense (Gleitman et al. 1996). While example (2a) could refer to a sequence of asymmetric kisses, the covert reciprocal (2b) can only refer to a symmetric kiss, i.e., on the lips.

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

Example (2b) describes a single event of symmetric kissing, in which John and Mary have identical participation: each of them is both kisser and kissed, i.e., each is both Agent and Patient in the event.

[1] We assume the semantics of weak reciprocity for the time being.

A variety of linguistic phenomena are sensitive to irreducible symmetry. One of them is the *discontinuous reciprocal construction,* found in numerous languages around the world, in which the logical subject of a reciprocal verb appears to be split between the syntactic subject and a *with-* phrase, henceforth *comitative argument.* (Dimitriadis 2002, to appear)

(3) O Giannis filithike   me ti Maria   (Greek)
     the John   kissed-Recip.Sg with the Maria
     'John and Maria kissed each other'

In a wide range of languages, discontinuous reciprocals can be formed only from reciprocal verbs that are irreducibly symmetric in meaning. In addition to providing evidence for the relevance of the notion, this construction provides us with a glimpse into the argument structure of symmetric events. It is shown in Dimitriadis (to appear) that discontinuous reciprocals cannot be treated as one-place predicates: their two arguments, subject and comitative oblique, must be treated as distinct arguments of the verb at all stages of the derivation. Evidence from such constructions shows that irreducibly symmetric events also involve two separate participants, and therefore cannot be treated as simple collectives (as proposed, for example, by Carlson 1998).

However, there are well-known technical problems with assigning the same thematic role to multiple participants in a single event, as suggested by the claim that John and Mary are separately Agents of the event described by example (2b). The conflicting requirements of keeping the subject and comitative participants distinct while preserving uniqueness of participants do not admit a straightforward solution. I propose to treat symmetric events as complex events that are "specified", in the sense of Link (1998), by sub-minimal events expressing the distinct relations of each participant to the symmetric event.

1 Symmetric predicates and symmetric events

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).[2] Reciprocals can in general be formed from either type of predicate:

(4) 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 orig-

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[2]A predicate that is not symmetric will be called *non-symmetric.* Such predicates are neutral with respect to symmetry: some symmetric pairs may or may not exist in their extension. Lack of symmetry must be distinguished from the property of being *asymmetric,* which holds for a relation if $xRy \rightarrow \neg yRx$. For example, *see* is non-symmetric but *precede* is asymmetric.

[3]The exceptions involve so-called "chained" or "asymmetric" reciprocals such as *The children followed each other into the room.*

inator and receiver of the activity described. But at the level of the individual events comprising a reciprocal situation, there is still a distinction between the two reciprocal sentences above. Sentence (4b) describes a plurality of events, each of which might be an event of asymmetric seeing; the reciprocal predicate is true just if for each participant there is some event of seeing and some event of being seen.[4] Such a state of affairs is not possible with events of meeting: There can be no event of John meeting Mary without that *same* event also being an event of Mary 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.*[5] We summarize the definition as follows:

(5) **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.

At this point I want to remain vague about the notion of event alluded to above; 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. For the time being our concern will be with showing that irreducibly symmetric events, as defined above, are treated as real entities by a number of linguistic constructions. How they might be formalized in the context of a Parsonean theory of events will be discussed in section 6.

While *meet* is irreducibly symmetric even when used transitively, it has long been known that other English verbs acquire irreducibly symmetric meaning, with a greater or lesser meaning shift, when used in a covert reciprocal (cf. Gleitman et al. 1996, Schwarzschild 1996 for discussion). For example, *talk* is not irreducibly symmetric when used transitively, as in (6a): The students are not talking to the teacher while she's talking to them. But the covert reciprocal (b) can only be understood symmetrically: It says only that John and Mary are engaged in conversation (not, for example, that they are addressing each other but not in the context of a conversation).[6]

(6) a. The teacher is talking to the students.
    b. John and Mary are talking.

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[4]For ease of exposition, we gloss over the variety of possible reciprocal situations identified by Langendoen (1978), Dalrymple et al. (1998), and others. We assume the semantics of weak reciprocity.

[5]The "symmetry" of reciprocal predicates, therefore, should not be confused with the property of irreducible symmetry. The reciprocal "X and Y saw each other" is symmetric on the X and Y positions, since these can be exchanged without loss of truth (as a matter of fact, this is true of pretty much any predicate with a conjoined subject). Nevertheless this predicate does not involve symmetric events. To avoid confusion I will not refer to reciprocal predicates as "symmetric" unless the underlying events are irreducibly symmetric.

[6]We ignore the irrelevant, non-reciprocal reading of sentence (6b), paraphrasable as "John is talking and Mary is talking."

Some verbs can refer to either symmetric or non-symmetric events. An example, discussed by Gleitman et al., is the transitive verb *to kiss*. As they put it:

(7) "Not all kissing is reciprocal (the flag never kisses one back), and reciprocal kissing is not always symmetrical kissing." (Gleitman et al. 1996).

In other words, the denotation of (transitive) *kiss* includes both symmetric and non-symmetric kisses. This is also true of reciprocals formed with *each other,* which do not appear to change the event type under consideration. Example (8a) is as vague as the transitive verb *kiss.* It 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 when used as a covert reciprocal, *kiss* becomes irreducibly symmetric; so example (b) can only refer to one or more kisses with symmetric participation, i.e., on the lips.[7]

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

We find the same behaviour in other languages. Many have reciprocal strategies that can create irreducibly symmetric predicates out of (possibly) non-symmetric base verbs, either obligatorily or optionally. Such strategies always appear to involve a verbal affix or clitic; I am aware of no argument reciprocals that change the event type of the verb they modify.

For verbal reciprocal strategies, there are several possibilities: First, a reciprocal strategy might always impose irreducibly symmetric semantics on its output (even if the base verb was non-symmetric). Such strategies are typically restricted to a subset of all verbs in the language (they are "middle strategies", in the terminology of Faltz 1977).[8] Greek, Hebrew, Hungarian and English are in this category.

A second category includes strategies that introduce irreducibly symmetric semantics for some, but not all of the verbs they apply to. Such a strategy may apply to all, or almost all transitive verbs in its language, but it only imposes irreducibly symmetric semantics to some of them. German, French, Serbian, Lao and Swahili have reciprocals of this type.

The third possibility is that a reciprocal strategy may not be compatible with irreducible symmetry at all; such strategies always co-exist with another strategy that must be used with irreducibly symmetric verbs. (I am aware of no language that only has asymmetric reciprocals, and it would be surprising if one exists).[9]

Some argument reciprocals are also incompatible with irreducible symmetry; the Serbian reciprocal *jedan drugog* 'each other' is one such case. For other argument reciprocals, irreducibly symmetry is simply irrelevant. This is the case

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[7]Example (b) could also refer to a sequence of kisses exchanged in greeting; in that case the "kissing" refers to the entire greeting ritual, which is itself symmetric when taken as a whole.

[8]Faltz's classification was intended for reflexive constructions, but can be naturally extended to reciprocals; see Dimitriadis and Everaert 2004.

[9]The first and second category correspond to the languages identified by Reinhart and Siloni (2003) as having reflexivization and reciprocalization operations that apply in the lexicon and in the syntax, respectively.

with *each other* in English, which applies identically to symmetric and non-symmetric transitive verbs. We now consider each possibility in turn.

2 Reciprocals and symmetry

2.1 The obligatorily symmetric reciprocals

Greek, Hebrew and Hungarian have verbal reciprocals that obligatorily refer to symmetric events; let's call them *obligatorily symmetric* reciprocals for short. In each case, the reciprocal form of the verb *kiss* can only refer to symmetric kisses. As already mentioned, on the other hand, argument reciprocals do not change the event type of the verb.

(9) a. O Yanis kje i Maria filithikan. (Greek)
the John and the Maria kissed-Rcp
'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)

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

(10) a. Én és a báty-ám meg-csókol-t-uk egymás-t.
I and the brother-1sg Prt-kiss-Past-1pl each.other-Acc
'I and my brother kissed each other'
b. János és Kati csókol-óz-t-ak.
John and Kate kiss-Rcp-Past-3pl
'John and Kate were involved in a mutual sexual type of kissing'

These reciprocalization strategies can only be applied to particular verbs (they are "middle strategies" in the sense of Faltz (1977)); the resulting reciprocals usually describe social interactions and other "naturally reciprocal" relationships.

It is common for some reciprocal verbs to take on idiomatic, non-compositional meanings, typically related to social interactions; these, too, are irreducibly symmetric. In such cases the base verb might not even describe a "naturally reciprocal" activity, but the reciprocal form will have all the typical properties of irreducibly symmetric reciprocals. The argument reciprocal in example (11a) can describe a series of blows, simultaneous or at different times, while sentence (b) can only describe a physical fight. Example (12b) 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 behavior is common cross-linguistically.

(11) a. O Yorgos kje i Maria xtipisan o enas ton alo. (Greek)
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.Rcp
'Yorgos and Maria came to blows (with each other)'

(12) 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.Rcp
'Nick and Anthony argued'

We find the same meaning shift in Hungarian. Example (13a) 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).

(13) 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-Rcp-Pst-3pl
'John and Peter were fighting/wrestling'

2.2 The optionally symmetric reciprocals

The second type of reciprocals are those in which we find the irreducibly symmetric meaning with some, but not all verbs. Let's call such strategies *optionally symmetric*. They are found in German, French, Spanish, Serbian, Lao, Swahili, Chicheŵa, and elsewhere. The (b) examples below either require or strongly favor symmetric kisses, while the (a) examples, which involve argument reciprocals, do not impose a requirement for irreducibly symmetric events.

(14) a. Jean et Marie se sont embrassés l'un l'autre. (French)
John and Mary Rcp were kissed each other
'John and Mary kissed each other'
b. Jean et Marie se sont embrassés.
John and Mary Rcp were kissed
'John and Mary kissed'

(15) a. Hans und Maria haben einander geküßt. (German; Kemmer 1993:112)
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 (16a) does not have irreducibly symmetric meaning.

(16) Johann und Maria vergöttern sich.   (German)
      Johann and Maria idolize   Refl/Rcp
      'Johann and Maria idolize each other (or: themselves)'

That *vergöttern* is not irreducibly symmetric can be demonstrated by the fact that it is incompatible with the discontinuous reciprocal construction; this is discussed in section 3.1.

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.

2.3 Other strategies

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.

(17) 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 Rcp 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:

(18) 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* cannot be used with verbs whose meaning *excludes* symmetric situations:

(19) 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:

(20) Les enfants se   sont suivi.
     the children Rcp 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. To others, such as *each other* in English, it seems simply irrelevant.

3 Discontinuous reciprocals

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.*

(21) a.   O Giannis kje i   Maria filithikan   (Greek)
           the John   and the Maria kissed-Recip.Pl
           'John and Maria kissed each other'
     b.   O Giannis filithike   me ti Maria
           the John   kissed-Recip.Sg with the Maria
           'John and Maria kissed each other'

In this section we summarize the analysis of discontinuous reciprocals presented in Dimitriadis (2002, to appear), and apply it to the investigation 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 in (21), but not with the "argument" reciprocals of the same languages, respectively *einander, jedan drugog,* and *o enas ton alo.* In fact, it seems to be restricted to verbal reciprocals; of the many languages discussed in Dimitriadis (to appear) that have the discontinuous construction, none allow it with argument reciprocals.[10]

We can add to our list of discontinuous reciprocals the covert reciprocals of English, many of which can be used discontinuously. Once again, the argument reciprocal *each other* cannot be used discontinuously.

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

Following Reinhart and Siloni (2003), I consider covert reciprocals to be derived from transitive verbs through a morphologically null argument structure operation.[11] English should be grouped with the "obligatorily symmetric" lan-

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[10]For evidence that *se* and *sich* are verbal reciprocals, see Zec (1985), Reinhart and Siloni (forthcoming), and the discussion in Dimitriadis (to appear).

[11]English covert reciprocals have been recognized as reciprocals since the early days of the generative literature, when the question of whether they can be transformationally related to *each-other* reciprocals was debated at some length. (Gleitman 1965, Fiengo and Lasnik 1973, Dougherty 1974,

guages like Greek and Hungarian, since covert reciprocals must be irreducibly symmetric. But because covert reciprocals are not morphologically marked, 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 can be shown that the semantics of discontinuous reciprocals is more specific, that is, more expressive, than the semantics of the corresponding simple reciprocals (Dimitriadis, to appear). To see this, we must consider discontinuous examples in which either the syntactic subject or the comitative argument is plural.

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

Example (23a) 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 (23b) 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. The simple reciprocal sentence (a) could also have been used to describe this situation, but 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 all stages of the derivation. In other words, discontinuous reciprocals must be analyzed as two-place predicates.

We have demonstrated that subject and comitative must be distinguishable in the semantics. It remains to rule out the possibility that such constructions involve (at some appropriate syntactic or semantic levels) a structured entity that is subdivisible into the appropriate subparts: the subject of (23b) might be the "group" $<<\text{Yanis} \oplus \text{Nikos}> \oplus \text{Maria}>$, which can be subdivided into the appropriate top-level subgroups, $<\text{Yanis} \oplus \text{Nikos}>$ and $<\text{Maria}>$. However, the work of Schwarzschild (1996) shows that such an analysis is not sustainable. The splitting of conjoined NPs into the parts of the conjunction is a discourse

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Langendoen 1978).

effect that can be overridden by providing an explicit criterion for grouping. For example, the most obvious interpretation of example (24a) is that the animals were separated into two groups, one consisting of the cows and the other consisting of the pigs; but if we add the phrase "according to color", example (24b) states that the animals were separated by color, regardless of species.

(24) a.   The cows and the pigs were separated (from each other).
    b.   The cows and the pigs were separated according to color.
    c.   The animals were separated according to color.

Therefore, Schwarzschild argues, if the cows and the pigs are the only animals then the subject of (24a) should be analyzed identically to that of (24c): both must be treated as plural individuals consisting of a number of atoms, with no intermediate structure.

On the other hand, the division of the discontinuous (25a) into subject and comitative *cannot* be overridden in this way, as the ungrammaticality of (25b) shows.

(25) a.   The cows were separated from the pigs.
    b.   # The cows were separated from the pigs according to color.[12]

The pairing structure we find in discontinuous covert reciprocals, in other words, is imposed by syntactic structure rather than by discourse effects, and cannot be overridden by manipulating the context. This means that we cannot extend Schwarzschild's analysis to discontinuous reciprocals: the tests on which his argumentation rests will fail for discontinuous reciprocals.

The same applies to languages with overt discontinuous reciprocals: The relation being described *must* hold between parts of the syntactic subject and parts of the comitative oblique. Let us consider the relevance of the covers analysis with a new example: Greek sentence (26a) can only describe hugs between a boy and a girl, not hugs between boys or between girls.

(26) a.   Ta agorja angaljastikan me   ta koritsja.
        the boys   hugged-Rcp with the girls
        = Each boy shared hugs with some (all?) *girls.*

To see that manipulation of the context cannot override this reading, consider a scenario in which a group of students has gone to a competition where participants compete in teams of two. Assume for now that some teams consist of a boy and a girl, while others consist of two boys or two girls. At the end of the competition, the entire group is praised for having done well, and each contestant hugs his or her teammate. We could then say (27a), but not (27b).

(27) a.   Ta agorja kje ta koritsja angaljastikan (o kathenas me to teri   tu).
        the boys   and the girls   hugged-Rcp the each   with the partner his
        'The boys and the girls hugged (each with their partner)'

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[12]Many speakers find this sentence acceptable if it so happens that all cows were one color and all pigs were another, so that the two species were separated from each other as a result of separating by color. In this case the division required by the syntactic structure (separation according to species) is respected by the explicitly stated criterion, color.

b. Ta agorja angaljastikan me ta koritsja (o kathenas me to teri   tu).
    the boys hugged-Rcp with the girls   the each   with the partner his
    'The boys shared hugs with the girls (each with their partner)'

Sentence (27a) says simply that each boy or girl hugged his or her teammate; instead of an unstructured assortment of hugs, the context tells us that each person hugged just one other, appropriate person. But sentence (27b) cannot be used felicitously. In this context it is only acceptable if, contrary to our earlier assumption, each team consisted of one boy and one girl: then it would be possible to simultaneously respect syntactic structure and the requirements of the context, and the sentence would be acceptable. (Compare example (25b) above). Thus the division into subject and comitative oblique cannot be overridden by the context.

Our example shows that manipulation of the context *can* affect the interpretation of our sentence, but only if it respects the distinctness of the two reciprocal positions. This is exactly what we expect if we adopt Schwarzschild's system but consider the subject and the comitative oblique to be two separate arguments.[13]

3.1 The role of symmetry

In a great number of languages, irreducible symmetry plays a prominent role in the distribution of discontinuous reciprocals. In particular, it is shown in Dimitriadis (to appear) that the discontinuous construction can only be used with reciprocal verbs that are irreducibly symmetric in meaning. In Serbian, for example, the reciprocal form of *kiss* can be used discontinuously, with irreducibly symmetric semantics, while the reciprocal of *hear* cannot; but 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.[14]

(28) a. Jovan i Marija   se ljube.
         John   and Mary.Nom Rcp kiss
         'John and Mary kissed'
     b. Jovan   se ljubi sa Marijom.
         Jovan.Nom Rcp kisses with Marija.Inst
         'John and Mary kiss'

(29) a. Jovan i Marija   se čuju.
         Jovan and Marija.Nom Rcp hear.3Pl
         'John and Mary hear each other'
     b. * Jovan se čuje sa Marijom
           Jovan Rcp hears with Marija.Inst
         (Ok with secondary meaning: 'John and Maria talk (to each other)')

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[13] A Schwarzschild-style analysis of sentence (27b) will involve a *paired cover,* which Schwarzschild defines precisely to account for dependencies between the arguments of two-place predicates. See Dimitriadis (to appear) for more details.

[14] 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.

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, *sich vergöttern* 'to idolize each other' cannot.

(30) a. Johann und Maria schlugen sich.
        Johann and Maria hit   Rcp/Refl
        'Johann and Maria hit each other/themselves'
     b. Johann schlug sich   mit Maria
        Johann hit   Rcp/*Refl with Maria
        'Johann and Maria hit each other/*themselves'[15]

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

(32) a. Johann und Maria vergöttern sich.
        Johann and Maria idolize   Refl/Rcp
        'Johann and Maria idolize themselves/each other'
     b. * Johann vergöttert sich mit Maria.

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

In the "obligatorily symmetric" languages, the required reciprocal construction can itself only be used if the result is irreducibly symmetric. Greek and Hungarian are in this category. In such languages the generalization is that if a verb can be reciprocalized, it can also be used discontinuously. 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.

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

(35) a. János és Kati csókol-óz-t-ak.   (Hungarian)
        John and Kate kiss-Rcp-Past-3pl
        'John and Kate were kissing'
     b. János csókol-óz-ott Kati-val.
        John kiss-Rcp-Past Kate-with
        'John and Kate were kissing'

English, which is in principle in this category, presents a problem: 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

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[15]This sentence also has an irrelevant instrumental reading, which says that Johann used Maria as a club to hit himself.

exponent of a reciprocalization operation, it is not clear what we should make of this observation.

In both types of languages considered here, 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 example is a classic example of a "chained reciprocal", in which the relationship holding between participants is asymmetric.

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

4 Counting symmetric events

We have seen that symmetric events are responsible for licensing the discontinuous construction, and that in many languages the result of a reciprocalization operation must be irreducibly symmetric. But it is reasonable to wonder if irreducibly symmetric predicates might not simply describe *pairs* of ordinary, "asymmetric" events. This would simplify the task of analyzing such predicates, and in fact seems necessary at some level of formalization, but it does not match the way we talk about events of this sort. As Siloni (2002) points out, symmetric verbal reciprocals do not show the counting ambiguities that characterize their argument reciprocal counterparts. In sentence (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. But sentence (37b) can only be about five kicking occasions (each involving an indeterminate, and irrelevant, number of kicks).

(37) 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.Rcp   five   times
          i. John and Mary kicked each other. There were a total of five kicks, or five kicking matches, all together.

(38) a. Dan ve-Ron nišku exad et ha-šeni xameš pe'amim. (Hebrew; Siloni 2002)
          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)

(39) a. John and Mary kissed 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:

(40) 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.

The contrast we found in example (39) has disappeared. Sentence (40a) lacks the ambiguity, even though it uses the reciprocal *each other,* which readily gives rise to scope-like ambiguities elsewhere.

In languages whose verbal reciprocals are not obligatorily symmetric, we predict that non-symmetric verbal reciprocals will be ambiguous, like argument reciprocals. This is indeed the case in German and Serbian, as the following examples show. The non-symmetric verbal reciprocals in the (b) sentences pattern just like the non-symmetric argument reciprocals in the (a) sentences.

(41) a. Johann und Maria traten einander fünf mal vors Schienbein (German)
　　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.

(42) a. Petar i Marko su se udarili pet puta. (Serbian)
　　Peter and Marko Aux Rcp kick five times
　　'Peter and Marko kicked each other five times'
　　i. ?Peter and Marko kicked each other. There were a total of five kicks.
　　ii. Peter kicked Marko five times; Marko kicked Peter five times. There were a total of ten kicks.
　b. Petar i Marko su udarili jedan drugog pet puta.
　　Peter and Marko Aux kick each other five times

    i. *Peter and Marko kicked each other. There were a total of five kicks.[16]
    ii. Peter kicked Marko five times; Marko kicked Peter five times. There were a total of ten kicks.

Verbs like *meet,* which are irreducibly symmetric regardless of the reciprocal's semantic contribution, behave just like in the obligatorily symmetric languages: the ambiguity disappears. In the following examples, the ten-event reading is ruled out for the argument reciprocal and the verbal reciprocal alike; the presence of irreducible symmetry blocks it, regardless of the form of the reciprocal.[17]

(43) 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.

(44) a.   * Petar i   Marko su   sreli jedan drugog pet puta.
              Peter and Marko Aux met each other   five times
       b.   Petar i   Marko su   se   sreli pet puta.
             Peter and Marko Aux Rcp met five times
          i.   There were a total of five meetings.
          ii. * There were a total of ten meetings.

Siloni (2002) gives a scopal account of the two readings of (38a), following Heim et al.'s (1991) analysis of sentences like *John and Mary won $100.* Siloni argues that the reciprocals we have identified as irreducibly symmetric are formed in the (computational) lexicon; syntactic reciprocals can undergo QR and give rise to ambiguities of this sort, but lexicon reciprocals cannot. Siloni's analysis makes substantially the same predictions as the account presented above where verbal reciprocals are concerned, but the two accounts diverge when we consider argument reciprocals: Only a symmetry-based analysis can explain why irreducibly symmetric base verbs like *meet* never give rise to ambiguous counts, even with argument reciprocals (which are necessarily formed in the syntax). A scopal account would predict that argument reciprocals should always give rise to the ambiguity.

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 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. No such effect would be expected if an event of meeting, or a symmetric kiss, in fact consisted of two asymmetric events. This proves what we set out to show in this section: that "symmetric events" truly behave as a single, symmetric event, rather than as a pair of simultaneous events that entail each other.

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[16]While there is some variation and noise in the judgements, the status of the crucial ten-event readings was clear: My Serbian consultant found that ten kicks were perfectly acceptable with either reciprocal, and ten meetings were clearly impossible.

[17]The argument reciprocal is incompatible with inherently symmetric verbs in Serbian, hence example (44a) is ungrammatical.

4.1 Scope-like ambiguities

The issue of individuating symmetric events has also been addressed, with generally similar results, by Carlson (1998). In this section I summarize some of his findings before reconsidering some of them in light of additional evidence. Carlson concludes, as we have done, that a symmetric covert reciprocal describes only a single event. For example, sentence (45) describes only a single event of meeting.

(45)   John and Bill met in Cleveland.

Carlson's argumentation is based on an asymmetry between sentences of the following sort:

(46)   a.   Bill and Mary (each) thought that they had kissed each other.
        b.   Bill and Mary (each) thought that they had kissed.

Such constructions, in which the subject of the reciprocal verb is a pronoun bound by a higher antecedent, were examined in the well-known study of reciprocals by Heim, Lasnik, and May (1991). Sentence (46a) can have two readings, known as the "we" and the "I" readings. According to the "we" reading, Bill thought "we have kissed each other", and Mary thought the same thing. In the "I" reading, Bill thought "I have kissed Mary", and Mary thought "I have kissed Bill".[18] In the "we" reading, the pronoun serving as subject of the embedded clause is coreferent with the plural individual *John and Mary*. In the "I" reading, the pronoun is bound by a distributive operator ranging over the members of the matrix subject.[19]

The ambiguity found with (46a) disappears when we substitute a covert reciprocal. Sentence (46b) only has the "we" reading. Carlson argues that such symmetric verbs do not distribute over their subject but have only a group reading, like collective predicates such as *gather*. Consequently they describe only a single event. Example (45), for example, describes a single event of meeting.

Carlson's goal was to show that verbs, by themselves, denote only singular events. Reference to multiple events can be introduced by an external quantifier, such as *each other*. This is clearly the case in examples like (47a), which involves a multitude of kicking events; but although Carlson assumed that multiple events are also involved when an irreducibly symmetric verb is involved, as in (47b), there is some evidence to the contrary.

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[18]Carlson also mentions a so-called "you" reading for sentence 46a, but this may be inaccurate; Heim et al. report the "you" reading only for sentences like (i), in which the first reciprocal serves as the antecedent of the embedded pronoun. According to this reading John told Mary that *she* should leave, and vice versa. The "you" reading does not appear to be available for example 46a.

(i)   John and Mary told each other that they should leave.

[19]It is immaterial whether the ambiguity is viewed as due to different scope possibilities for the reciprocal, as Heim et al. propose, or as the result of different possible antecedents for the dependent pronoun, as Williams (1991) argues. (The latter option is also defended in Dimitriadis (1999, 2000)).

(47) a.   John and Bill kicked each other.
       b.   John and Bill met each other in Cleveland.

The event-counting test from the previous section does not distinguish between *meet* and *meet each other*; neither of the following sentences is compatible with a situation in which there were two meetings.

(48) a.   John and Bill met once.
       b.   John and Bill met each other once.

Each of the above sentences only allows one meeting, while a non-symmetric verb in the same construction is ambiguous. Example (49) most likely means that there were two visits, one by each participant.

(49)   John and Bill visited each other once.

This is not to say that the two sentences in (48) necessarily have the same logical form; it is quite plausible that *each other* introduces the possibility of reference to multiple events, as Carlson assumes; but the symmetric semantics of *meet* force the identity of the referred-to events, so that only a single event is involved after all. The result is that the different potential readings of (48b), if they may be called that, are indistinguishable.

We find additional support for this conclusion if we substitute a symmetric verb in place of *kiss* in example (46). Recall that *kiss* is not symmetric as a transitive, but becomes so when used as a covert reciprocal. This is why sentence (46a) is ambiguous but sentence (b) is not. With *meet,* no ambiguity is possible with either sentence: If John believes that he met Bill, he must believe that he and John met.[20]

(50) a.   John and Bill believed that they had met each other.
       b.   John and Bill believed that they had met.

We conclude that while covert reciprocals only refer to a single event, as Carlson argues, argument reciprocals need not always refer to multiple events. This does not affect any other aspects of Carlson's analysis; in particular, it is consistent with his position that every verb must introduce reference to just one event.[21]

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[20]Carlson states that the symmetric *collide, marry* and *exchange glances* give rise to ambiguities like *kiss;* but the ambiguity only seems to arise if we construe these verbs as non-symmetric (e.g., if we take *collide* to mean "crash into"). Otherwise there is no truth-value difference between the "I" and "we" construals. For example, the "I" reading of (i), Carlson's (25a), is given in (i.a); it is equivalent to the "we" reading in (i.b), unless *furtively* in (i.a) can be taken to describe Beth's manner only, not Sue's. But it is not at all clear that this is the case.

(i)   Beth and Sue believed that they had exchanged glances with each other furtively.
       a.   Beth believed that she had exchanged glances with Sue furtively.
       b.   Beth believed that she and Sue had exchanged glances furtively.

[21]The one-event condition might have to be relaxed to mean "one event for any combination of participants." Sentences (ii) and (iii) are potential counterexamples to the stronger claim:

(i) a.   The committee members hugged.
       b.   The committee members kissed.

5 The thematic roles of symmetric participants

Each participant to an ordinary event fulfils a different role: a kiss involves the kisser or Agent and the kissed or Patient. But as we have seen, a symmetric kiss must be described as a *single* event, in which the participants are identically involved. Example (51) refers to a single event of kissing, each of whose participants was both kissing and being kissed. The direct object of *kiss* can easily be any sort of inanimate object, but the comitative used here must be animate.

(51) O Yanis filithike   me ti Maria.
      the John kissed.Rcp with the Maria
      'John kissed with Maria.'

While we have defined irreducibly symmetric predicates as those whose two arguments must have necessarily identical participation, the two arguments of discontinuous reciprocals are not identical in all respects. When there is considerable difference in the status of the participants, for example, it is often possible to use a symmetric predicate discontinuously where its simple form would be odd.

(52) a.   The car collided with the tree.
      b. #   The car and the tree collided.

(53) a.   The bicycle is near the garage.
      b. #   The bicycle and the garage are near each other.

But this does 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 and to discourse structure effects. (Cf. also Dowty 1991, Carlson 1998). Gleitman et al. suggest that symmetrical comparisons, like ordinary predicates, have a Figure-Ground structure; whichever participant appears on nonsubject position becomes the Ground. In similarity comparisons, the subject is understood to have some property that is characteristic of the Ground; therefore example (54a) 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 (55), the difference between the two versions disappears.

(54) a.   China is similar to North Korea.
      b.   North Korea is similar to China.
      c.   North Korea and China are similar.

(55) a.   North Korea is similar to China in size.

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      c.   Beth, Sue and Jake exchanged glances.

While sentence (i) does suggest a group hug, as Carlson predicts, the other two seem to involve multiple (symmetric) events in their interpretation. This seems to be a type of accommodation triggered to rescue the sentences, which would otherwise be weird: only two people can participate in a single exchange of glances, and it is difficult to conceive of (for example) a five-way kiss.

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.

The discontinuous construction is doubtless useful as a way to assign unequal discourse status to the participants in a single symmetric event. The construction also provides the opportunity to use modifiers that target the subject only (such phenomena provide additional evidence that the two positions are distinct arguments; cf. Dimitriadis, to appear).

(56) Peter küßte   sich gerne mit Maria.   (German; Behrens et al. 2003)
     Peter kissed.Sg Rcp gladly with Maria
     'Peter liked to get kissing with Maria'

There is also some evidence that the two positions, subject and comitative oblique, differ subtly in the degree of agency they require. Note that it is odd to say (57a) if John forced the kiss on Mary. It is also odd to say (57b) 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.

(57) 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. The non-discontinuous (58a) is odd, just like its English counterpart, but many Greek speakers find the discontinuous (58b) to be acceptable.

(58) a.   # O Nikos kje to aghalma filithikan.
           the Nick and the statue   kissed.Rcp
           'Nick and the statue kissed'
     b.   O Nikos filithike   me to aghalma.
           The Nick kissed.Rcp.Sg with the statue
           'Nick engaged in a mutual kiss with the statue'

It seems that Nick should be acting as if the statue is also participating in the kiss. This is a subtle effect that does not seem to hold universally in other languages. My consultants reported the Hebrew and Serbian equivalents of (58b) to be ill-formed; Rákosi (2004) reports that while he initially disliked the same example in Hungarian, he later came to consider (59b) well-formed.

(59) a.   # János   és a szobor   csókol-óz-t-ak.   (Hungarian)
           John.Nom and the statue.Nom kiss-Rcp-Pst-3pl
           'John and the statue kissed'
     b.   János   részegen csókol-ózo-tt a szobor-ral.
           John.Nom drunk   kiss-Rcp-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).

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

In each case, it seems 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.

While the topic clearly merits further investigation, I will assume here that the two positions are thematically identical, in the sense of having the same thematic relationship with the lexical verb; I will assume that additional requirements on the subject, such as differences in instigation or degree of participation required, are associated with its syntactic position (for example, we might treat them as contributed by some functional head rather than by the verb root).

6 Formalizing symmetric events

We now come to the question of how to formalize our notion of symmetric events in the context of a general event semantics. In particular, I assume the common "neo-Davidsonean" system of the type proposed by Parsons (1990), which relies crucially on the notion of thematic roles in addition to the notion of an event variable. For the purposes of this discussion I will take it for granted that the participants in a symmetric event have thematically identical relations to the event, and that any differences are non-thematic in nature as already discussed.

In pursuing an analysis we can identify two distinct but interrelated questions: First, what is the thematic role assigned to the subject of a symmetric reciprocal; and second, what is the relationship between the role assigned to the subject and the role assigned to the comitative of a discontinuous reciprocal.

The challenge is how to formalize the idea that there are two participants with thematically identical participation, without running afoul of the problems inherent in assigning the same thematic role to multiple participants in a single event. We take as our starting point the analysis of discontinuous reciprocals articulated by Siloni (2002).[22] Following an analogous analysis of reflexive verbs

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[22] An alternative approach, adopted by Rákosi (2003), is to give the second argument of the discontinuous reciprocal the special role *Partner*. The asymmetries in initiative and participation between the two arguments lead Rákosi to reject the proposal that the two positions are thematically identical; he treats the subject as a simplex Agent, not a combined Agent-Theme. The Partner is a Theme-like argument that is intended not as a semantic role relation, but as a syntactic label for an underspecified patient-like role, which Rákosi describes as somewhat similar to Experiencer.

While this solution is consistent with Rákosi's assumptions, it does not account for the symmetric entailments that do arise in such constructions; thus it does not help us with our goal of formalizing the notion of participants with thematically identical involvement.

(Reinhart and Siloni 2003), Siloni argues that lexical reciprocalization works by *bundling* the two theta roles of the underlying transitive predicate into a single complex theta role, e.g., [Agent-Theme].

(61)　Bundling of roles by θ-unification: V[Agent],[Theme] $\rightarrow$ V[Agent-Theme].

In the case of reflexives, the application of this is straightforward; Reinhart and Siloni interpret a bundled role as the "distributive conjunction" of the two roles, i.e., assigning a bundled role is just like assigning the two component roles to the same participant. So if John is an Agent-Theme of e, then John is an Agent and a Theme of e. But this is not appropriate for reciprocals. For example, assigning the bundled role to the participants of *kiss* would entail that John kissed himself. Siloni proposes that bundled reciprocal roles are assigned to *pairs* of participants, who can then be assigned to the component roles in either order (reflecting the symmetry of the relationship).

　This allows Siloni to formulate the correct semantics for discontinuous reciprocals, by requiring each pair to contain an element from the subject and an element from the comitative:

(62)　$\forall x \in S \, \forall y \in P \, (\exists e \, (\text{kiss}(e) \, \& \, [\text{Agent-Theme}](e, \{x, y\})))$

However, this approach does not escape the problem of undesired entailments. Suppose that the bundled role is interpreted distributively, with each component assigned arbitrarily to one of the pair's elements. In that case, we can expand an Agent-Theme relation as in (a) and eliminate some conjuncts, getting (b). This gives us the undesired entailment that, for example, John kissed himself.

(63)　a.　$[\text{Agent-Theme}](e, \{J, M\}) \rightarrow$
　　　　　$(\text{Agent}(e, J) \, \& \, \text{Theme}(e, M)) \, \& \, (\text{Agent}(e, M) \, \& \, \text{Theme}(e, J)) \rightarrow$
　　　b.　$(\text{Agent}(e, J) \, \& \, \text{Theme}(e, J))$

It would not help to simply add a non-identity condition (to the effect that the Agent cannot be equal to the Theme) to the translation of the reciprocal; this would not block the derivation of (63b), but would lead to a logical contradiction in combination with it. (This means that our reciprocal formula would also be logically inconsistent, since it entails a contradiction).

　I can only see two ways to rescue the analysis: either the Agent-Theme role must remain unanalyzed, or the event variable must be decomposed into smaller events. We pursue the second approach here.

　We have seen that there are, in some linguistically real sense, symmetric "events" of kissing, colliding, arguing, etc. Such events are treated as atomic by tests such as counting and scope-like ambiguities, and can be shown to have two distinguishable event positions. But our toolbox of neo-Davidsonean events cannot express multiple assignments of the same thematic relation. To do so, we must resort to a level of representation below the level to which our linguistic tests have access. We do so by adapting the relation of *specification* defined by Link (1998).

(64)　Event specification (Link 1998:251–261).

a. The set of eventuality variables E forms a complete atomic lattice, intrinsically ordered by $\leq$.

b. There is a 2-place relation S on the set E^o of atomic events. eSe' means "e specifies e'".

Specification is meant to express relationships between eventuality variables representing the same real-world event. We use it to model a symmetric event as an eventuality that is specified by two eventualities of the same type, with permuted roles for its participants. We stipulate that events specifying some superior eventuality are obscured by it; when we count events, we only count eventualities that are (possibly) specified but do not themselves specify some "larger" eventuality.

We can then define the expansion of Siloni's [Agent-Theme] bundle as follows:

(65) [Agent-Theme]$(e, A) =$
$\forall x \in A \exists y \left(\{x, y\} = A \ \& \ \exists e' \ (e'Se \ \& \ \text{Agent}(e', x) \ \& \ \text{Patient}(e', y)) \right)$

If A is a two-element set as in (62), this formula introduces a separate eventuality variable for each element, with both eventualities specifying e. The two eventualities represent, for example, John's kissing Mary and Mary's kissing John. They are components of a composite, symmetric event which they both specify, but the simplex roles are only defined at the lower level. Since the two Agent roles modify different variables, the problem of incorrect entailments does not arise.[23]

This brief sketch has not addressed the question of which sentence modifiers can make reference to which eventuality variables. Various agent-oriented modifiers target only the syntactic subject when applied to a discontinuous reciprocal (cf. example (56)), and in such cases the association should be preserved in our semantics.

7 Conclusions

All reciprocals describe situations that are in some manner reciprocated between participants; but irreducibly symmetric predicates form a distinct class within them, and a variety of syntactic constructions are sensitive to the distinction. But formalizing the notion poses challenges, especially since the properties of discontinuous reciprocals require us to treat symmetric reciprocals as two-place predicates.

The analysis outlined in the previous section imposes a certain burden of complexity; it requires a layered event structure of sub-events specifying our symmetric event, *and* an elaboration of argument-passing mechanisms to allow a two-element set to be assigned to the bundled role. But it can be seen that

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[23] A benefit of the formulation in (65) is that it can be used for reflexives as well: if A only has a single element, the formula is satisfied if we choose $x = y$, and the result expresses the appropriate reflexive meaning (the introduction of a spurious e' is harmless).

the conflicting requirements of uniqueness of thematic roles and symmetry of the predicate require something along these lines, if the symmetry of the event participants is to be expressed. However, Carlson (1998) argues that differences between the argument and comitative positions, even if they are not per se thematic, are sufficient to differentiate the two roles; and therefore that in all cases uniqueness of roles is preserved.

For truly symmetric predicates, Carlson provides an ingenious analysis: they are one-argument predicates that are interpreted collectively; so *John and Mary met* is true of the group *John and Mary*. For all its merits, Carlson's analysis unfortunately cannot account for the interpretation of certain discontinuous constructions. Consider again example (23b), repeated below. This could describe either two separate conflicts between Maria and one of the men, or a single conflict in which John and Nick, together, are in conflict with Maria. This last reading cannot be expressed if we treat *argue* as a one-place collective predicate, since no subgroups could be retained among the parts of its argument.

(23b) O   Yanis kje o   Nikos tsakothikan me ti   Maria
      the John and the Nick argued.Rcp with the Maria
      'John and Nick argued with Maria'

It does not appear that irreducibly symmetric reciprocals are simply collectives. Our conclusion is supported by Hackl (2002), who shows that "essentially plural" relational nouns are semantically and syntactically distinct from genuine collectives. As he points out, these are in fact symmetric nominal reciprocals, and they share many properties with the symmetric reciprocals discussed here.

There is a final alternative that one could pursue, and this is that thematic roles of this sort are simply the wrong way to look at this phenomenon. Dowty (1991) argues that thematic roles are not necessary in semantics, and that syntax only needs them as a means of indexing semantic arguments against syntactic projections. He shows that the latter can be accomplished by positing just two "proto-roles", proto-Agent and proto-Patient, that are associated with the subject and direct object positions respectively. The argument with the most Agent-like characteristics (Dowty provides a list) is identified as the proto-Agent and appears as the subject, and the one that is most Patient-like becomes the subject. The existence of only two role types means that uniqueness of roles is not required; in our case, this would mean that a symmetric event is, simply, a two-place predicate that makes (near-)identical entailments of its two participants. If the two positions are truly identical, initiative-related entailments for the subject are due to its syntactic position (Dowty recognizes this factor, and expresses uncertainty about just which properties are thematic and which are due to syntactic position); if the factor of initiative is thematic, it is enough to allow that participant to claim the proto-Agent role.

If this is the case, a symmetric predicate is simply a symmetric predicate and there is not much more to say. The problem, from our perspective, is that the absence of unique roles prevents the adoption of a simple neo-Davidsonean event

semantics: As Parsons made clear, his system relies on the existence of a unique thematic relation for each event participant. If we want an explicit system of eventuality variables and binary role relations, we will still need the kind of system developed for the bundled role account. This is simply a consequence of the neo-Davidsonean system's need to individuate event participants by associating them with distinct theta roles.

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