Discontinuous reciprocals

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Abstract

This paper demonstrates a close connection between the *discontinuous reciprocal* construction (i) and the semantics of *irreducibly symmetric events,* that is, events involving a binary relationship whose two participants have necessarily identical participation.

> i. O   Yanis filithike   me ti Maria.   (Greek)
>   the John kissed.Rcp.Sg with the Maria
>   'John and Maria kissed each other'

It is shown, contrary to prior claims, that discontinuous reciprocals cannot be derived from the corresponding "simple" reciprocals. The comitative participant of the discontinuous reciprocal must be analyzed as a separate, second argument of the reciprocal verb. A formal analysis of such reciprocals is outlined, which takes the semantics of irreducible symmetry as the core reciprocal meaning for this type of reciprocal; identification of the two arguments is treated as a second, optional operation, accomplished through an analogue of the reflexivization operator.

1   Introduction

The prototypical reciprocal sentence consists of a subject, necessarily plural, and a predicate that expresses reciprocation over some two-place relation. Alongside this familiar structure, many languages allow the so-called *discontinuous reciprocal* construction, exemplified in sentence (1b) for Greek.

(1) a. O   Yanis kje i   Maria filithikan.
       the John and the Maria kissed-Rcp.Pl
       'John and Maria kissed each other'
    b. O   Yanis filithike   me ti Maria.
       the John kissed-Rcp.Sg with the Maria
       'John and Maria kissed each other'

The logical subject of the reciprocal is here divided into two parts: one part appears in syntactic subject position, the other in a *with-* phrase (henceforth *comitative argument*). The verb carries the same reciprocal morphology as in the "simple reciprocal" sentence (1a), but subject agreement is controlled by the syntactic subject only.

It should be noted that this example involves a particular grammatical device for expressing reciprocity, through verbal morphology. Greek also has a quantifier-like *argument reciprocal,* similar to English *each other;* but as example (2) shows, this does not allow the discontinuous construction.

(2) a. O   Yanis kje i   Maria filisan   o   enas ton alo.
   The John and the Maria kissed.Pl the one the other
   'John and Maria kissed each other'

   b. * O   Yanis filise   o   enas ton alo   me ti Maria.
      the John kissed.Sg the one the other with the Maria

I will refer to each such (language-particular) grammatical device for expressing reciprocity as a reciprocal *strategy*.[1] A reciprocal strategy might employ a quantifier-like word, a clitic, a verbal affix, or even no overt morphology at all. The exponent of the verbal reciprocal strategy in example (1) is in fact ordinary passive morphology; passive-marked verbs in Greek may variously receive a passive, reflexive, reciprocal, or middle interpretation. But not every passivized verb is multiply ambiguous: the reciprocal meaning is restricted to particular verbs (as indeed are the reflexive and middle meanings, to their own sets of verbs). It follows that only these reciprocal verbs are capable of forming discontinuous reciprocals.

Discontinuous reciprocals are found in very many languages around the world, including Hebrew, Greek, German, Hungarian, Russian, Polish, Serbian, Sakha, Japanese, Lao, and Bantu languages including Swahili, Chicheŵa, Kinyarwanda and Ciyao; but they are not found in Dutch, French, Italian, or (standard) Spanish, except for isolated cases which we will discuss presently. (Mchombo and Ngunga 1994, Siloni 2001, Enfield 2003, Seidl and Dimitriadis 2003) Some more examples follow. Again, the verb agrees with the syntactic subject alone.

(3) a. Hem hitnašku   (Hebrew; Siloni 2001)
   they kissed.Rcp
   'They kissed'

   b. Hu hitnašek   im Dina
   he kissed.Rcp with Dina

(4) a. Juma na   Pili wa-na-pend-an-a.   (Swahili)
   Juma and Pili SM-Pres-love-Rcp-FV
   'Juma and Pili love each other'

   b. Juma a-na-pend-an-a   na Pili.
   Juma SM-Pres-love-Rcp-FV with Pili
   'Juma and Pili love each other.
   (lit: Juma is in a reciprocal-love relation with Pili)'

(5) a. Johann und Maria schlugen sich.   (German)
   Johann and Maria hit   Rcp
   'Johann and Maria hit each other'

   b. Johann schlug sich mit Maria
   Johann hit   Rcp with Maria
   'Johann and Maria hit each other'

(6) a. * Il s'est   embrassé avec Dina.   (French)
   he Rcp is kissed   with Dina

(7) a.   Giovanni e   Maria si   sono abbracciati.
   Giovanni and Maria Rcp are   hugged

   b. * Giovanni si   è abbracciato con Maria.   (Italian)
   Giovanni Rcp is hugged   with Maria

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[1]The term "strategy" is used in the sense of Faltz (1977): A reciprocal strategy is some particular, language-specific grammatical device used to encode a reciprocal relationship between participants. The idea is that a language has as many "reciprocal strategies" as it has "different" reciprocals. (cf. Dimitriadis and Everaert, 2004). Lichtenberk (1985) uses the term *reciprocal construction* for the same notion.

(8) a. Juan y   María se   han besado.   (Spanish)
        Juan and Maria Rcp have kissed
    b. * Juan se   ha besado con María.
        Juan Rcp has kissed with Maria

For convenience, I will say that a reciprocal strategy or a reciprocal verb is "used discontinuously" when it is used in a discontinuous reciprocal construction.[2] It is easy to show that the construction is not general-purpose adjunction, but is specific to certain reciprocal strategies. In all the languages I have considered, it occurs with reciprocal strategies that create reciprocal verbs, not with argument reciprocals like *each other*. In some languages (such as Swahili and Lao), verbal reciprocals are the primary or only reciprocal strategy; in others they exist alongside argument reciprocals, as in Greek.

To the above list we may add the "covert reciprocals" of English. By this I mean symmetric transitive verbs such as *meet, kiss* and *marry,* which are interpreted as reciprocal when used intransitively with a plural subject. Many such verbs, too, allow the discontinuous construction. Verbs that cannot be interpreted as covertly reciprocal, such as *elect,* cannot be used discontinuously.

(9) a. John met Mary.
    b. John and Mary met.
       = John and Mary met each other.
    c. John met with Mary.
       = John and Mary met each other.

(10) a. John elected Mary.
     b. * John and Mary elected.
        (≠ John and Mary elected each other)
     c. * John elected with Mary.
        (≠ John and Mary elected each other)

If we agree to consider examples like (9b,c) as the product of a morphologically unmarked reciprocalization operation, they are parallel to those in the other languages on our list.[3] However, the lack of morphological marking means that we can never be sure whether we are dealing with the output of a covert reciprocalization operation or simply with a verb that has reciprocal-like semantics. For this reason, I do not base any conclusions on the behaviour of English sentences. Nevertheless examples from English are occasionally convenient, and are a useful aid to intuition if one does not speak a language with morphologically obvious discontinuous reciprocals.

1.1 Symmetry

What determines whether a reciprocal strategy can be used discontinuously? We will see that with one notable set of exceptions, reciprocal verbs that allow the discontinuous construction must denote an *irreducibly symmetric event,* that is, an event expressing a binary relationship whose two participants have necessarily identical participation. This notion can be illustrated with covertly reciprocal verbs in English: Example (11a), which involves an argument reciprocal, can refer to an exchange of non-symmetric kisses, perhaps on each other's cheek or hand. But the covert reciprocal in (11b) requires a *symmetric* kiss, with equal participation from both parties (Gleitman et al. 1996). Typically it might

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[2]I use the term *reciprocal strategy* for the reciprocalization operator, and *reciprocal verb* for the result of applying the strategy to some verb. The terms *argument reciprocal* and *verbal reciprocal* refer to different types of reciprocal strategies, or (when there is no possibility of confusion) to the reciprocal verbs that they generate.

[3]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, Langendoen 1978).

More recently, Schwarzschild (1996) treats such verbs as reciprocals, and Reinhart and Siloni (2003) consider them to be derived from transitive verbs through a morphologically null argument structure operation.

describe a kiss on the lips, but it might also refer to kissing in greeting, which consists of simultaneous kisses on or near each other's cheek. In either case the events described are irreducibly symmetric.

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

In some languages, including Greek and Hebrew, reciprocalized verbs always have irreducibly symmetric semantics and (consequently) allow the discontinuous construction. In others, such as German and Lao, a reciprocal strategy does not always create irreducibly symmetric predicates; but only reciprocals that *are* irreducibly symmetric can be used discontinuously. We can illustrate this, for German, with the contrast between the reciprocal verb *sich schlagen,* which has the irreducibly symmetric idiomatic meaning 'not get along', and the non-symmetric *vergöttern* 'idolize'. Only the former can be used discontinuously.

(5) a. Johann und Maria schlugen sich.
     Johann and Maria hit   Rcp
     'Johann and Maria hit each other'
    b. Johann schlug sich mit Maria
     Johann hit   Rcp with Maria
     'Johann and Maria hit each other'

(12) 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.

Unfortunately this generalization, while remarkably consistent in the many languages to which it does apply, must contend with a large systematic exception: In several Bantu languages I have considered, the discontinuous construction appears to be possible without requiring irreducible symmetry of the predicate. While at this time I have no explanation for this difference, the remaining languages clearly show a close connection between irreducible symmetry and the discontinuous construction. Therefore I propose an analysis based on the factor of symmetry, with the caveat that it does not apply to the Bantu reciprocals in question.

1.2 Interpretation

Reciprocal verbs, like pronominal reciprocal predicates, appear to be intransitive. It is generally claimed (or simply assumed) that the comitative phrase "augments" the denotation of the subject, leading to an interpretation that is essentially like that of the corresponding simple reciprocal. The analysis of the discontinuous form is therefore based on the corresponding "simple reciprocal" sentences, either by means of syntactic movement or at the level of interpretation (Vitale 1981, Mchombo and Ngunga 1994, Siloni 2001).

However, careful inspection shows that such an analysis is not tenable. The semantics of discontinuous reciprocals is more specific, that is, more expressive, than the semantics of the corresponding simple reciprocals. To see this, we must consider discontinuous examples in which either the syntactic subject or the comitative argument is plural.

(13) 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 (13a) describes strife between the three members of the subject, with no specification of which party or parties were in conflict with whom. But (13b) is either about an argument between John and Nick

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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 would 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.

I will argue that the semantics of discontinuous reciprocals requires the two postitions, subject and comitative, to be treated as distinct arguments at all stages of the derivation. This is only possible if the reciprocal verb is semantically a two-place verb, rather than a derived one-place predicate. This proposal has consequences for our understanding of reciprocal formation: If a discontinuous reciprocal is a two-place predicate, then it cannot have the semantics customarily assigned to reciprocals, which include intransitivization of the base predicate (Heim et al. 1991a, Dalrymple et al. 1998b, and others).

In section 5, I show how the identification of the two arguments can be separated from the core reciprocal semantics; this allows the definition of a semantics for irreducibly symmetric reciprocals that extends to discontinuous reciprocals.

1.3 Outline

The overall theme of this paper is that the discontinuous reciprocal construction, along with a number of other syntactic and semantic effects, can be related to the factor of irreducible symmetry. This leads us to the question of how, and when, irreducible symmetry is introduced and manipulated by reciprocalization and other operations in the grammar. This is a question that can be distinguished, at least in principle, from the question of the role of symmetry in the behaviour of reciprocals, and I will not attempt a full answer to it here. But alongside the main themes of symmetry and discontinuous reciprocals that this paper is organized around, the following pages explore an intriguing claim arising from the work of Reinhart and Siloni (2003, and elsewhere): that the discontinuous construction is restricted to verbal reciprocals formed "in the lexicon." When we take the factor of irreducible symmetry into account, this suggests that only reciprocals formed in the lexicon (in the sense of Reinhart and Siloni) can introduce irreducibly symmetric semantics. While Reinhart and Siloni's proposals raise more issues than can be pursued here, the association of irreducibly symmetric reciprocals with derivation in the lexicon suggests an explanation for numerous observations that we will encounter, and will be a recurrent side theme in our discussion.

The remainder of this paper develops in more detail the claims of the previous sections. In section 2 I introduce some notions and terminology that I adopt, and give an overview of various salient factors that divide reciprocals into types.

Section 3 introduces the notion of "irreducibly symmetric events" that underlies my characterization of the conditions for admissibility of the discontinuous reciprocal construction. While the idea is not new, I show that it is a semantic notion with concrete syntactic consequences, and that it is qualitatively different from the reciprocal situations that underlie well-known analyses such that of Langendoen (1978) and Dalrymple et al. (1998b).

The structure of the discontinuous reciprocal is examined in more detail in sections 4 and 5. I will show that the subject and the comitative oblique must remain distinguishable as distinct arguments of the reciprocal verb at all stages of the derivation, and propose a suitable semantic analysis.

Section 6 takes up some loose ends, and acknowledges some of the directions I haven't gotten around to exploring.

2 Types of reciprocals

Reciprocals are morphosyntactically and interpretationally diverse; they can be expressed as a quantifier-like argument of the verb, or as an intransitivizing reciprocalization operator that may or may not be morphologically attached to the verb. Interpretationally, the exponent of reciprocity might be a dedicated reciprocal, like English *each other,* it might be ambiguous between reciprocal and reflexive meanings (as with German *sich,* or it might be ambiguous between a reciprocal and a collective meaning. In this section, I give an overview of various salient factors that divide reciprocals into types, and clarify some of the notions and terminology that I have already been using.

2.1 Morphosyntactic types

From the morphological viewpoint, we can distinguish two major classes of reciprocal markers: arguments of the verb (a noun phrase, pronoun or quantifier phrase) and modifiers on the verb or verb phrase (adverbs, inflectional or derivational affixes or operations, and some clitics). Some examples:

(14) **Argument reciprocals**
    a. John and Mary like each other.   (English)
    b. O Yorgos kje o Nikos agapane *o enas ton alo.*   (Greek)
       the Yorgos and the Nikos love   the one the other
       'Yorgos and Nikos love each other'
    c. Hem nišku *ze et ze / ehad et ha-šeni.*   (Hebrew; Siloni 2001)
       they kissed this Acc this   one Acc the-second
       'They kissed each other'

(15) **Verbal reciprocals**
    a. Hem hitnašku.   (Hebrew; Siloni 2001)
       they kissed.Rcp
       'They kissed'
    b. Wa-li-on-*an*-a.   (Swahili)
       SM-Past-see-*Rcp*-FV
       'They saw each other'
    c. Ils *se* sont embrassés.   (French)
       they *Rcp* are kissed
       'They kissed each other'

This categorization, which follows an analogous classification of reflexives, (Faltz 1977, Dimitriadis and Everaert 2004),[4] relies on the visible morphology of the reciprocal strategy; but nevertheless it is not always straightforward. The French clitic *se,* for example, appears to be a cliticized pronoun, hence an argument reciprocal; but as Kayne (1975) already showed, on closer inspection it turns out to be a verbal intransitivizing operator. We review a couple of arguments, reproduced here from Siloni (2001) who adapted them to reciprocals. The first argument involves auxiliary selection: Transitive verbs in French use the auxiliary *avoir* 'to have' to form complex tenses, while intransitives use *etre* 'to be'. Reflexive and reciprocal verbs pattern with the intransitives. (*Etre* also triggers obligatory agreement on the verb participle).

(16) a. Ce filles, ils les ont embrassé-(es).
       these girls they them have kissed
       'These girls, they kissed them'
    b. Elles   se sont embrassé-*(es).
       they.Fem Rcp are kissed
       'They kissed each other'

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[4]Faltz uses the name *NP reflexives* for the first category. I prefer "argument reciprocals" to "NP reciprocals" to avoid irrelevant issues like the question of whether English *each other* is an NP.

A second argument involves causative constructions. When a transitive verb appears in the complement of the causative verb *faire* 'make', its subject must be introduced by the preposition *à*. But the subject of an intransitive in the same position cannot, and need not, be introduced by *à*. Sentence (c) shows that the object clitic *le* is treated like a full NP object; but *se*-reciprocals behave like intransitives (sentence (d)), and therefore *se* must be considered an intransitivizing operator rather than an object pronoun.

(17) a. Pierre a   fait   embrasser Jean *(à) Marie.
      Pierre has made kiss   Jean to   Mary
      'Pierre made Jean kiss Mary'

    b. Pierre a   fait   courir Marie.
      Pierre has made run   Mary
      'Pierre made Mary run'

    c. Pierre l'a   fait   embrasser à Marie.
      Pierre him has made kiss   to Mary
      'Pierre made him kiss Mary'

    d. Pierre a   fait   s'embrasser Jean et   Marie.
      Pierre has made SE   kiss Jean and   Mary
      'Pierre made Jeon and Mary kiss each other'

We conclude that *se* is not an argument of the verb, but an operator that alters the argument structure and semantics of the verb. Similarly, Zec (1985) showed that the clitic *se* in Serbian is not an argument of the verb but a verbal operator. One of her arguments involves comparative ellipsis: The transitive phrase in (18a) is followed by an accusative-marked NP, which is interpreted as the object of the elided phrase. This is also possible with the argument reflexive *sebe* 'himself', as (18b) shows, but not with *se*. The conclusion is that *se* is an intransitivizing operator that creates a reflexive or reciprocal verb; the sentence is ungrammatical because object comparison requires a transitive verb in the antecedent. (Zec only provides the reflexive example (c), but the reciprocal (d) shows the same behaviour).

(18) a. Petar   je   brania   mene   uspešnije nego Anu.
      Petar.Nom Aux defended me.Acc better   than Ana.Acc
      'Peter defended me better than he defended Anna'

    b. Petar   je   branio   sebe   uspešnije nego Anu.
      Petar.Nom Aux defended himself better   than Ana.Acc
      'Peter defended himself better than he defended Anna'

    c. * Petar   se   branio uspešnije nego Anu.
      Petar.Nom Aux Self   defended better than Ana.Acc
      'Peter defended himself better than he defended Anna'

    d. * Lekari   su se brani   uspešnije nego Anu.
      doctors.Nom Aux Rcp defended better   than Ana.Acc
      'The doctors defended each other better than they defended Anna'

The converse situation is also possible: an argument reflexive or reciprocal may be incorporated or cliticized to the verb, resembling a verbal operator on casual inspection. Mchombo (1993) shows that this is the case with the Chicheŵa reflexive marker *dzi*. However (as Mchombo also shows) the Chicheŵa reciprocal suffix *-ana* is indeed an intransitivizing operator. Mchombo relies on Zec's comparative ellipsis test; since Chicheŵa does not mark case on nouns, the evidence turns on the availability of readings rather than on outright ungrammaticality. In the reflexive example (19a), the comparative complement *asodzi* 'fishermen' can be interpreted as either the subject or the object of the elided clause; we conclude that the reflexive construction is syntactically transitive, with the reflexive affix *dzi* acting as the incorporated object of a transitive verb. But the reciprocal example (19b) only allows a subject interpretation, showing that the reciprocal suffix *-ana* is not an argument of the verb but an intransitivizing operator.

(19) a. Alenje á-ma-dzi-nyóz-á kupósá asodzi.
      hunters SM-Hab-Refl-despise-FV exceeding fishermen
      i. 'The hunters despise themselves more than the fishermen (despise themselves)'
      ii. 'The hunters despise themselves more than (they despise) the fishermen'
   b. Alenje á-ma-nyóz-án-á kupósá asodzi.
      hunters SM-Hab-despise-Rcp-FV exceeding fishermen
      i.   'The hunters despise each other more than the fishermen (despise each other)'
      ii. * 'The hunters despise each other more than (they despise) the fishermen'

Compared to these rather straightforward cases, the status of German *sich* is considerably more nuanced. Various syntactic tests of argumenthood are sensitive to the interpretation and syntactic position of *sich,* and consequently, a number of studies have concluded that it is actually ambiguous between forms of different grammatical status. However, accounts diverge on the question of just which constructions and meanings belong together. Steinbach (1998) argues that *sich* is an argument under its reflexive use, but an intransitivizing operator under its middle interpretation. He does not, however, discuss the status of reciprocals.

When we apply Zec's comparison test, it suggests that *sich* has the status of an argument, not an intransitivizer; and this seems to hold for reciprocal as well as for reflexive *sich.*

(20) Die Pferden hassen sich mehr als den Hund.
     The horses hate Refl/Rcp more than the.Acc dog
     'The horses hate themselves/each other more than (they hate) the dog'

On the other hand, reflexive and reciprocal *sich* has a number of properties characteristic of verbal operators. Reinhart and Siloni (forthcoming) conclude that it can function either as an argument structure operator or as a "simplex anaphor" that cannot be locally bound. As evidence that it is an operator, they point out that it cannot express coindexation between two internal arguments (example (21a)). The direct object *is* structurally able to be bound by the indirect object: use of *sich selbst* instead of *sich,* as in example (21b), results in a well-formed reflexive sentence. Reinhart and Siloni attribute the ungrammaticality of (21a) to general restrictions that prevent the reflexivization operator from targeting two internal arguments.

(21) a. Ich habe ihm sich selbst gezeit.
      I have him-DAT himself-ACC shown
      'I showed himself to him'
   b. ?? Ich habe ihm sich gezeit.
      I have him.Dat Refl shown

Gast and Haas (2004) also argue that we should distinguish two types of *sich,* which they refer to as "clitic" and "pronominal": The former type functions as a "middle marker" (that is, a verbal operator), and can have reflexive, reciprocal or middle meanings; while the latter can only be reflexive. The distribution of clitic *sich* is restricted: it cannot, for example, be used in prepositional phrases, and consequently *sich* in such environments can only be interpreted as a reflexive. Emphasis or syntactic topicalization also forces use of pronominal *sich,* with concomitant loss of the reciprocal meaning:

(22) SICH konnten die Spieler nicht leiden, aber sie mochten den Trainer.
     Refl could the players not bear but they liked the coach
     'The players could not bear themselves/*each other, but they liked the coach'

The lack of convergence between these accounts suggests that the matter has not been adequately resolved yet; but together, they make a compelling case for *some* sort of duality in the status of *sich.* For our purposes it is enough to know that *sich can* behave as a verbal reciprocal; as we will see, data from other languages suggests that the constructions that concern us here are incompatible with argument reciprocals. Therefore I will henceforth treat *sich* as a verbal modifier. Its pronominal uses are simply incompatible with the phenomena under study.

We must also decide what to do with cases where there is no overt marking of any kind, as with covertly reciprocal verbs in English. If these constructions are to be analyzed as reciprocals, we have a choice between two "invisible" strategies: there might be a phonologically null anaphor, which would make the construction an argumental reciprocal; or there might be a silent reciprocalization operation, which derives a reciprocal verb that is phonologically identical to the transitive verb; then we're dealing with verbal reciprocals. In the case of English, covert reciprocals have various traits characteristic of verbal reciprocals, such as being restricted to particular verbs (those that are symmetric); therefore it seems plausible to adopt the second solution. It is conceivable that for other languages the opposite might be true.[5]

Discontinuous reciprocals, as we will see, are only possible with verbal strategies. I will argue that this follows from the nature of the comitative argument of the discontinuous reciprocal: As we will see in section 4, the comitative is at some level of representation an argument of the verb. Therefore it cannot co-occur with an argument reciprocal, which necessarily saturates the internal argument of the verb.

2.2   Classifying by use

Languages often have more than one grammaticized reciprocal strategy. Again we may adopt the approach to reflexives of Faltz (1977), who classifies reflexive strategies on the basis of their uses. The one that can be used with arbitrary transitive verbs is named the *primary* reflexive strategy (or primary "strategy").[6] Faltz additionally identifies *middle reflexive strategies,* which are lexical or semi-productive devices used with particular groups of verbs; *secondary reflexives,* which are specialized for reflexivization involving an oblique argument (for example, *lui-même* in French); and *subordinate reflexives,* used primarily cross-clausally. We can use the same criteria to characterize reciprocals.[7] The categories of primary and middle reciprocal strategies, in particular, will be germane to our discussion.

A middle strategy, by definition, is restricted in its application to some group of verbs. While the particular verbs involved vary from language to language and the size of the verb classes can vary greatly, the core membership of these groups is fairly consistent cross-linguistically: Middle reflexives tend to be associated with verbs of grooming and body care actions, which are typically performed by a human on themselves (Faltz 1977). Middle reciprocals are generally used with verbs describing activities that are either necessarily or very frequently symmetric in meaning; they include many social interaction verbs. (Kemmer (1993:95ff) uses the term *naturally reciprocal events*).

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[5]György Rákosi (personal communication) points out another argument in favor of this option: English is in general morphologically impoverished, meaning that many derivational operations are morphologically unmarked; while pro-drop in English is quite restricted in general. Therefore a null verbal operation is (for English) more plausible than a null pronominal.

[6]Faltz's actual definition is considerably more detailed: a primary reflexive is used with a prototypical transitive verb, which must have an Agent or Experiencer argument plus a Patient argument, and must carry agreement and tense morphology if these are marked on verbs in the language in question. The construction must be productive, and must be unambiguously reflexive. The test verb must satisfy a number of additional criteria.

Although a language could in principle have more than one primary reflexive, Faltz's survey did not find any languages with more than one. Multiple primary reciprocals, on the other hand, are easier to come by. (Faltz names English *each other* and *one another* as basically interchangeable primary reciprocal strategies).

[7]Faltz's classification, which is based on prototypical use, does not fully account for the potential uses of a strategy: it does not distinguish, for example, between the primary reflexives of English and French; but only the former can be used with oblique arguments, as in (i). In French, the secondary reciprocal *lui meme* must be used instead.

(i)   John thought about himself.
(ii) * Jean se pensait.   (French)
(iii)   Jean pensait à lui-même.

Accordingly, Dimitriadis and Everaert (2004) argue that it is more useful to consider the separate uses to which each reflexive strategy can be put, rather than just its prototypical domain of use. The English reflexive can be described as able to reflexivize both direct and oblique objects, while the French one applies to direct objects alone.

2.3   The lexicon-syntax parameter

Reinhart and Siloni (2003) argue that verbal "arity operations" (that is, argument structure operations including reciprocalization and reflexivization) should be divided into two classes: those that apply in the "lexicon" and those that apply in the morphosyntactic component of grammar. They adopt a view of the lexicon as an "active" component of grammar, with its own word-building operations and well-formedness constraints (Reinhart 2000, 2002, Siloni 2002). The idea is that reciprocal strategies that apply in the syntax are not lexically restricted in their application, and can express reciprocity between entities that are not co-arguments of the reciprocal verb; while lexical reciprocals are limited to particular verbs and can never reciprocalize over an extended domain, but *can* change the lexical structure of the base verb.

Reinhart and Siloni identify a number of covarying properties that distinguish "lexical" from "syntactic" arity operations, and propose that they are controlled by the setting of a single parameter of Universal Grammar: the Lexicon-Syntax (or Lex-Syn) parameter. Depending on the setting of this parameter, a language will either perform such operations in the lexicon or in the syntax. The parameter should apply uniformly to any reflexive, reciprocal, middle or impersonal arity operations in a language's morphological inventory. Some of the characteristic properties, such as the possibility of application over extended syntactic domains, clearly follow from the assumption of syntactic vs. lexical application. Others, like the suppression of accusative case,

(23)   **The Lexicon-Syntax parameter**
        UG allows arity operations to apply in the lexicon or in the syntax.

While an adequate discussion of the theory would take us too far afield, the categorization is relevant to our purposes because the discontinuous reciprocal construction was identified by Siloni (2001) as one of the diagnostics for the distinction: Discontinuous reciprocals are said to be possible only with lexical reciprocal strategies, and impossible with syntactic ones. We will see below that while this correlation is generally correct, there are some complications that must be taken into account.

For this reason I will discuss the predictions made by Reinhart and Siloni, and even retain the labels "lexical" and "syntactic", but will remain more or less agnostic about their cause. In particular, I treat the question of lexical or syntactic application as a property of the individual reciprocal strategies (and likewise of other arity operations), rather than of the language as a whole. It follows that a language could have both kinds of strategies in its inventory; I will argue in section 2.3 that Greek is just such a language. Furthermore, I will show that a single strategy can sometimes apply "lexically" and sometimes "syntactically", receiving the full complement of associated properties in each case.

Let us now consider the empirical content of the lexicon-syntax distinction: What are the properties that distinguish lexical from syntactic reciprocals? Reinhart and Siloni attribute a number of covarying properties to the distinction.

1. **Productivity** Languages that have syntactic reciprocals tend to have more of them: While productivity is not in principle incompatible with application in the lexicon, lexical reciprocals are generally restricted to a closed, relatively small set of verbs. Syntactic verbal reciprocals can be formed from almost any transitive verb with few or no restrictions.

2. **Ambiguity** Many of the verbal reciprocalization strategies we have considered are ambiguous between reciprocal and reflexive (and sometimes other) meanings. French and German reciprocal verbs can be ambiguous between reciprocal and reflexive readings; for example *sich schlagen* can mean 'to hit oneself' or 'to hit each other'. In lexical languages such as Hebrew and Russian, on the other hand, derived verbs typically have a reflexive or a reciprocal meaning, not both.

3. **Lexical shift** Reciprocals formed in the lexicon frequently assume idiomatic meanings that diverge, to a greater or lesser extent, from the meaning of the base verb. For example, the Hungarian verb

talál 'to find' has the reciprocal form *talál-kozik* 'to meet' (Rákosi 2004). The meaning of syntactic reciprocals must be compositionally derived.

4. **Derived predicates** While all reciprocals under discussion are subject to Binding Principle A, lexical and syntactic reciprocals differ in their ability to define a reciprocal relationship between arguments of a syntactic domain larger than a single verb. Syntactic reciprocals can target the subject of an exceptionally Case marked (ECM) subject; lexical reciprocals cannot. (Examples from Siloni 2001, Reinhart and Siloni 2003).

(24) a. Pierre et Jean se   sent entendus chanter la Marseillaise.   (French)
       Pierre and Jean Rcp are heard   sing   the Marseillaise
       'Pierre and Jean heard each other sing the Marseillaise'
   b. Giovanni e   Maria si   sono visti danzare.   (Italian)
       Giovanni and Maria Rcp are   seen dance
       'Giovanni and Maria saw each other dance'

(25) * Dan ve-Ron hitra'u racim.   (Hebrew)
      Dan and-Ron saw.Rcp run

5. **Accusative assignment** When the indirect object of a ditransitive verb is reciprocalized, syntactic strategies behave as one might expect: the remaining argument remains unaffected and can be expressed, as in (26a). But in lexical languages, the remaining argument disappears (example b); Reinhart and Siloni argue that lexical reciprocalization suppresses assignment of accusative case to the remaining argument.

(26) a. Pierre et   Jean se   sont écrit   des   lettres.   (Siloni 2001)
       Pierre and Jean Rcp are   written some letters
       'Pierre and Jean wrote each other letters'
   b. Dan ve-Ron hitkatvu   (*mixtavim).
       Dan and-Ron wrote.Rcp   letters

6. **Discontinuous reciprocals** Finally, we have already noted that the discontinuous reciprocal construction is possible with lexical, but not with syntactic reciprocals.

(3) a. Hem hitnašku   (Hebrew; Siloni 2001)
      they kissed.Rcp
      'They kissed'
   b. Hu hitnašek   im Dina
      he kissed.Rcp with Dina

(6a) * Il s'est   embrassé avec Dina.   (French)
      he Rcp is kissed   with Dina

Some of the above properties, such as the ability to reciprocalize across extended syntactic domains, logically follow from the assumption of lexical versus syntactic application. Others, in particular the suppression of accusative assignment and the ability to form discontinuous reciprocals, are a priori unexpected and must be explained by the theory. (I do not have anything to add to Reinhart's account of accusative suppression; I use it purely as a diagnostic of a systematic difference between two types of reciprocals).

While the use of discontinuous reciprocals generally corresponds with the lexical languages of Reinhart and Siloni's classification, there are a number of issues that we must address. To begin with, German is classified as a syntax language but quite a few German verbs can form discontinuous reciprocals (and accordingly I have been presenting German as a language that *allows* discontinuous reciprocals). The

same situation is found in Serbian and, as Siloni (2001) already pointed out, also to some extent in Romanian. We will see that in fact such cases have all the characteristic properties of lexical reciprocals.

Siloni allows that syntactic languages may also have isolated lexicalized reciprocals, which behave like the reciprocals of lexical languages. Given the prevalence of "lexical" reciprocals in syntactic languages (especially German), and the fact that such reciprocals do not appear to differ from the lexical reciprocals of lexical languages, it seems that lexical reciprocals are in fact present in all languages. Lexical and syntactic languages differ not in where reciprocalization applies, but in whether it is possible in the syntax. A lexical language has some number of lexical reciprocals, with particular identifying properties, while a syntactic language has a large number of productive, syntactically derived reciprocals, and a number of frozen lexical forms.[8] Note that while this point of view accounts for the behaviour of German reciprocals, it treats the difference between French and German as accidental: they are both syntactic languages, and German just happens to have many more lexical reciprocals than French.

Greek actually has two ways of forming reciprocal verbs, i.e., two verbal reciprocal strategies. The strategy discussed so far involves application of ordinary passive morphology;[9] let's call it the *passivization* strategy. As a reciprocal-forming strategy it is restricted to certain verbs (typically social-interaction verbs, as mentioned above), and the result invariably has irreducibly symmetric semantics. A second strategy involves the incorporated adverb *alilo* 'reciprocally', in combination with (again) passive morphology. This strategy does *not* impose irreducibly symmetric semantics on the result, and can be used productively.

(27) a. O   Yorgos kje o   Manolis alilo-katigorithikan.
        the Yorgos and the Manolis reciprocally-accused.Rcp
        'Yorgos and Manolis accused each other'
     b. * O   Yorgos kje o   Manolis katigorithikan.
        the Yorgos and the Manolis accused.Rcp

The *alilo-* strategy can also be used with verbs which do allow the passivization strategy, yielding pairs of reciprocal verbs that differ in their symmetry properties. Alongside the symmetric kissing described in example (36a), we have:

(28) O   Yorgos kje i   Maria alilo-filithikan.   (Greek)
     The Yorgos and the Maria reciprocally-kissed.Rcp
     'Yorgos and Maria kissed each other' (non-symmetric)

In short, Greek has two verbal reciprocal strategies: One is "obligatorily symmetric", i.e., it creates verbs with irreducibly symmetric semantics and is restricted to the loose class of "naturally reciprocal" verbs. The second strategy can apply to ordinary verbs, and does not introduce irreducibly symmetric semantics. This is at odds with the idea that the lexicon-syntax parameter causes all arity operations in a language to behave alike. I will assume that the parameter of lexical or syntactic derivation is determined separately for each reciprocal strategy.[10]

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[8]If reciprocals are representative of other manifestations of the Lexicon-Syntax parameter, this parameter is not really about where arity operations apply, but about what's possible in the syntax. If so, it might be reformulated as follows:

   (i) *Lexicon-Syntax Parameter (revised)*
       A language may allow or prohibit arity operations in the syntax.

However, Tanya Reinhart (personal communication) argues that this phenomenon, the lexical application of arity operations in syntactic languages, is only found in the domain of reciprocals; not with other arity operations such as reflexives, middles or impersonals. The issue, as already noted, is too large to address properly here.

[9]Passive morphology in Greek may variously confer passive, reflexive, reciprocal, middle or impersonal meaning; there are in addition "deponent" passive verbs, that have no active form and are not semantically or syntactically passive.

The secondary meanings of the passive are restricted to particular classes of verbs, reducing the potential for ambiguity.

[10]A separate issue is that Greek reciprocal verbs pattern with the lexical languages according to the tests discussed above: the construction is restricted to certain verbs (typically social interaction verbs), it can be used discontinuously, and it suppresses accusative; but on the basis of additional considerations, Papangeli (2004) argues that Greek is in fact a syntax language. I will leave this issue unresolved here, and classify Greek reciprocals as lexical on the basis of the properties that are germane to the present work.

The phenomena that concern us in this paper can be adequately analyzed without assuming the possibility of derivation in the lexicon; in fact, I argue that they depend directly on the factor of irreducible symmetry, *not* on any other conceivable consequences of the difference between lexical and syntactic derivation. For the purposes of this paper it would be sufficient to distinguish a symmetric and a non-symmetric reciprocal type, without reference to their locus of derivation, except for one fact: Reciprocals analyzed as "lexical" appear to be the only ones that can have a lexically listed, non-compositional meaning. In languages such as German and Serbian, a given verbal reciprocal can sometimes be interpreted as either symmetric or non-symmetric; when that's the case the non-symmetric interpretation is always compositional in meaning, while the symmetric one can be associated with an idiomatic meaning. For example, in Serbian the reciprocal *se cuje* (from *čuti* 'to hear') has the compositional meaning 'to hear each other' as well as the idiomatic secondary meaning 'to talk (to each other)'. Only the latter meaning passes the various syntactic and semantic tests of irreducible symmetry.[11] This phenomenon does lend support to a lexical derivation model, since it is most readily explained if symmetricization is a lexical-component operation, and therefore co-occurs with the availability of listed, non-compositional meanings; while syntactic derivation must give rise to compositional meanings.

A number of other similar phenomena lend indirect support to Reinhart and Siloni's viewpoint. The notion of derivation in the lexicon will be a recurrent side theme in the following sections.

2.4   Classifying by meaning

Reciprocity is a semantic as well as a grammatical notion, and accordingly we will distinguish between *reciprocal strategies,* which are the grammatical means of forming a reciprocal sentence, and reciprocal *situations,* which are real-world states of affairs that a reciprocal sentence might or might not truthfully describe. As Lichtenberk (1985) puts it:

(29) The former [i.e., reciprocal strategy][12] is a formal concept: it refers to a language-specific means used to encode reciprocal and, perhaps, other situations. The latter [reciprocal and other situations] are semantic, real-world concepts defined by particular types of relations of the participants to each other or to themselves.

It is no simple matter to characterize just which kinds of situations can be described by a reciprocal strategy. When the subject of the reciprocal predicate comprises several individuals (rather than just two), there are a number of distinct situation types that could be described using a reciprocal sentence. An important early insight into sorting out the relevant situations is due to Langendoen (1978), who considered a number of relation types that might characterize reciprocal situations, and identified their formal truth conditions and implicational relationships between them. These include the now-familiar strong reciprocity (all pairings of individual members of the subject must stand in the predicated relationship), weak reciprocity (each individual member of the subject must participate as a giver and as a receiver of the predicated relationship), and several others.

Langendoen concluded that a single situation type, weak reciprocity, can account for most reciprocals formed with *each other*; the exception are some (but not all) predicates expressing an asymmetric spatial or temporal relationship, such as the following:

(30) a. The plates are stacked on top of one another.
       b. The boxes are nested inside one another.
       c. The guests followed one another (into the room).

In general, the relationship between grammar and reciprocal situation types is rather complex. While the work of Schwarzschild (1992, 1996) and Dalrymple et al. (1998b) shows that situation types are to a great extent determined by the discourse context, the choice of verb and a number of syntactic factors

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[11]See section 3.5 for more details.

[12]Lichtenberk actually uses the term *construction*.

also play a role. Filip and Carlson (2001) show that the distributive and collective verbal operators *na-* and *po-* in Czech have a marked effect on the types of situations that a reciprocal verb can apply to.[13]

Lichtenberk (1985, 1999) identifies a broader range of situations that reciprocal forms can describe: In addition to situations of the kind identified by Langendoen, Lichtenberk lists the *reflexive, chaining, "converse", collective, distributive, repetitive,* and *depatientive* situation types. This inventory is broader than Langendoen's because it includes situation types that the English reciprocal *each other* cannot be used with (but that reciprocal strategies of other languages can).

Reciprocal polysemies fall into two broad types, *reciprocal-reflexive* and *reciprocal-collective* poly-semies. Kemmer (1993:p. 100) remarks that while these two types are common cross-linguistically, she was not aware of any cases of three-way polysemy. This suggests a division of reciprocals into reflexive-type, collective-type, and dedicated reciprocals. Unfortunately Kemmer's generalization does not hold universally: Warrwa (Australian, McGregor 1999) is likely a counterexample, although the evidence is uncertain. Nick Evans (personal communication) identifies several other languages of Australia with three-way polysemy, including Mardurra and Binig.[14]

A reciprocal situation typically involves a multitude of events, which taken together must satisfy some stated relationship between their participants. 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. But as we will see, the property of irreducible symmetry does not characterize the cumulative reciprocal situation but the elementary events that constitute it.

3   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).[15] Reciprocals can in general be formed from either type of predicate:

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

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 the stated activity. But if we focus on the individual events comprising a reciprocal situation, we find that there is still a distinction between the two reciprocal sentences above. A sentence like (31b) 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.[16] Such a state of affairs is not possible with events of meeting: There can be no event of John meeting Mary without that

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[13]Langendoen already pointed out that weak reciprocity is not applicable to the semantics of covertly reciprocal verbs in English. To them he assigns a kind of strong reciprocity. Langendoen's own examples are subtle and rather involved, but the contrast he identified can be illustrated by the following examples: Sentence (i) suggests a series of pairwise hugs between committee members, but the covert reciprocal verb in (ii) is more readily interpretable as a group hug.

  (i) The team members hugged each other.
  (ii) The team members hugged.

[14]A related meaning-based classification is adopted by Frajzyngier (1999), who groups reciprocals according to the *gram-maticalization strategy* that has led to the reciprocal form. Major sources are *reflexive markers, adverbs meaning "mutually",* and *elements with reciprocal meaning.*

[15]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.

[16]For ease of exposition, this description glosses over the variety of reciprocal situations discussed in section 2.4. We may assume the semantics of weak reciprocity for the remainder of this section.

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.*[17] We summarize the definition as follows:

(32) **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.

While *meet* is irreducibly symmetric even when used transitively, other English verbs acquire an irreducibly symmetric meaning, with a greater or lesser meaning shift, when used in a covert reciprocal. For example, *talk* is not irreducibly symmetric when used transitively, as in (33a): 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.

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

Some verbs can refer to either symmetric or non-symmetric events. An example, discussed by Gleitman et al. (1996), is the verb *to kiss.* As they put it:

(34) "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 *kiss* includes both symmetric and non-symmetric kisses.

Reciprocals formed with *each other* do not change the event type under consideration, so example (35a) 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. On the other hand, it has long been known that covert reciprocals in English can only refer to symmetric events (Schwarzschild 1992, 1996, Gleitman et al. 1996); so example (b) can only refer to one or more kisses with symmetric participation, i.e., on the lips.[18]

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

We find the same behaviour in other languages. In all the cases that I am aware of, argument reciprocals do not change the event type of the verb they modify. But verbal reciprocals give rise to irreducibly symmetric predicates, either obligatorily or optionally.

The distinction between the two kinds, those that *must* be irreducibly symmetric and those that may or may not be, *generally* corresponds to Reinhart and Siloni's classification into "lexical" and "syntactic" operations (Reinhart 2000, Siloni 2002), which we introduced in section 2.3.[19] Stategies classified as lexical according to Reinhart and Siloni's criteria must always produce reciprocals with irreducibly symmetric semantics; while if a verbal reciprocalization strategy is classified as syntactic, it may or may not produce irreducibly symmetric reciprocal verbs.

3.1 The "lexical" reciprocals

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

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[17]The "symmetry" of reciprocal predicates 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.

[18]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.

[19]There are minor complications that are discussed below.

(36) 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.

(37) 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'[20]

These reciprocalization strategies can only be applied to particular verbs, mainly social interaction verbs and other verbs of "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 reciprocal verbs. Non-reciprocal example (38a), from Greek, can describe a series of blows (simultaneous or at different times), while reciprocal sentence (b) can only describe a physical fight. Example (39b) 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)' means 'to cross paths' in its reciprocal form, *diastavronome*. Such behavior is common cross-linguistically.

(38) 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)'

(39) 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 (40a) 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).

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[20]Hungarian reciprocals allow a depatientive (arbitrary-object) interpretation; this sentence could also mean that John and Kate were involved in kissing with other persons, rather than with each other.

For some discussion of reciprocal-depatientive polysemy in other languages, see Ndayiragije (2003), Maslova (forthcoming). Seidl and Dimitriadis (2003) suggest that this construction should be analyzed according to Chierchia's (1995) treatment of impersonals in Italian, namely as binding by an existential quantifier constrained to range over arbitrary (non-specific) human entities.

(40) 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'

3.2   The "syntactic" reciprocals

The second group of languages, the "syntactic" languages in the Reinhart and Siloni classification, are those in which we find the irreducibly symmetric meaning with some, but not all verbs. Let's call such strategies *optionally symmetric.* The (b) examples below either require or strongly favor symmetric kisses, while the (a) sentences, which involve argument reciprocals, do not impose a requirement for irreducibly symmetric events. (As in the lexical languages, argument reciprocals do not alter the event type of the base verb).

(41) 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'

(42) 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 (43a) does not have irreducibly symmetric meaning.

(43) 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 3.4.

In French, reciprocals with *se* can even be used with verbs that are semantically incompatible with a symmetric situation:

(44) Les enfants se   sont suivi
     the children Rcp are   followed
     'The children followed each other'

It can be seen that German *sich,* French *se,* and analogous reciprocal strategies in other such 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 the argument reciprocals of English. While it might seem that symmetry is simply irrelevant to the application of this type of strategy, I will argue in section 3.5 that strategies of this sort are in fact ambiguous: When the resulting verb is irreducibly symmetric, it has all the properties associated with "lexical" reciprocals; when it is not, it behaves as expected of "syntactic" reciprocals according to Reinhart and Siloni's theory. We could say, therefore, that the strategy can apply either in the lexicon or in the syntax.

3.3 Counting symmetric events

It is reasonable to wonder if irreducibly symmetric predicates might not simply involve *pairs* of ordinary, "directed" events. This would simplify the task of analyzing such predicates (and may even be appropriate 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 of this type do not show the counting ambiguities that characterize their argument reciprocal counterparts. In sentence (45a), 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 (45b) can only be about five kicking occasions (each involving an indeterminate, and irrelevant, number of kicks).

(45) 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.

(46) 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)

(47) 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:

(48) 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 (47) has disappeared. Sentence (48a) 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 irreducibly symmetric, we predict that non-symmetric verbal reciprocals will be ambiguous, like argument reciprocals. This is indeed the case in German and Serbian:

(49) 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.

(50) 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.[21]
      ii. Peter kicked Marko five times; Marko kicked Peter five times. There were a total of ten kicks.

As expected, the ambiguity does not arise with verbs like *meet,* which are irreducibly symmetric regardless of the reciprocal's semantic contribution.

(51) 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.
(52) 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 ambiguity between the two readings of (46a), following Heim et al.'s (1991a) analysis of sentences like *John and Mary won $100.* Siloni argues that argument reciprocals and verbal reciprocals formed in the syntax can undergo QR and give rise to ambiguities of this sort, but lexical reciprocals cannot. Because of the close relationship between "lexical" reciprocals and irreducible symmetry, the analysis presented above makes the same predictions as Siloni's account as far as verbal reciprocals are concerned. (We must also assume, as we have been, that symmetric reciprocals are formed in the lexicon even in "syntax" languages). But the two accounts diverge when we consider argument reciprocals: Only a symmetry-based account can explain why irreducibly symmetric base verbs like *meet* never give rise to ambiguous counts, even with argument reciprocals (which are necessarily syntactic).

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 directional events. This proves what we

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[21]Unsurprisingly, there is some variation and noise in the judgements. My Serbian consultant did not much like the five-kick readings with *either* kind of reciprocal; but the status of the crucial ten-event readings was clear: Ten kicks were perfectly acceptable with either reciprocal, and ten meetings were clearly impossible.

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.

3.4 Symmetry and discontinuous reciprocals

In the preceding sections we have identified some semantic properties that can help one decide if a given predicate is irreducibly symmetric. We now return to the discontinuous construction, an easily observable syntactic configuration that correlates strongly with irreducible symmetry. The generalization is that the discontinuous reciprocal construction can only be used with reciprocals that are irreducibly symmetric.

For the obligatorily symmetric strategies (the "lexical" ones), this means simply that the discontinuous construction is in principle available with all reciprocal verbs, since irreducible symmetry is in all cases required. This seems indeed to be the case. Some examples are given below.

(1) a. O   Yanis kje i   Maria filithikan.   (Greek)
       the John and the Maria kissed-Rcp.Pl
       'John and Maria kissed each other'

(1b) O   Yanis filithike   me ti Maria.
       the John kissed-Rcp.Sg with the Maria
       'John and Maria kissed each other'

(53) a. O Nikos kje o   Andonis tsakothikan.
       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'

(3) a. Hem hitnašku   (Hebrew)
      they kissed.Rcp
      'They kissed'

(3b) Hu hitnašek   im   Dina
     he kissed.Rcp with Dina

(54) 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: a number of symmetric verbs, including *kiss,* are in fact incompatible with the discontinuous construction. But since there is no visible exponent of a reciprocalization operation, it is not clear what we should make of this observation.

The real substance of our prediction concerns languages with optionally symmetric reciprocals. The following examples show that German allows discontinuous reciprocals, but *only* with irreducibly symmetric reciprocals. The construction is possible with *schlagen* and *küssen,* but not with *vergöttern.*

(5) 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'[22]

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

(55) 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.

Note again that it is not the semantics of the underlying transitive verb that matter: the verb *schlagen* 'to hit' is non-symmetric, but the reciprocal *sich schlagen* has the irreducibly symmetric meaning 'to fight' or 'to not get along'.

We find exactly the same situation in Serbian: The reciprocal form of *kiss,* with irreducibly symmetric semantics, can be used discontinuously, 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 but cannot be used discontinuously are *help, praise,* etc.

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

(57) 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)')

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 (58a) below. But the discontinuous reciprocal construction is only possible with the usual "naturally reciprocal" verbs, as examples (b) and (c) show.

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

3.5   Two types of reciprocalization

Our examples so far are consistent with the view that "optionally symmetric" strategies simply ignore the symmetry factor: If the resulting verb happens to have irreducibly symmetric semantics, then it can be used discontinuously; otherwise it cannot. But closer inspection shows that the presence or absence of symmetry correlates with a number of other properties identified by Reinhart and Siloni, which cannot be attributed to irreducible symmetry itself. A nice illustration of this is given by Venezuelan Spanish.

Recall (from section 2.3) that "syntactic" reciprocals formed from a ditransitive verb allow accusative assignment to a remaining direct object; while lexical reciprocals always withdraw accusative from all arguments. Example (59a) shows that reciprocals in Venezuelan Spanish allow accusative assignment to an object. But as example (b) shows, the same verb also allows the discontinuous construction (a characteristic of "lexical" reciprocals). While this would seem to contradict the claim that there

are two types of reciprocal, sentence (c) shows that it is not possible to use these two constructions at the *same* time: Either property is possible by itself, but they are incompatible with each other. This behavior is expected if reciprocalization can apply either in the syntax, preserving accusative assignment, or in the lexicon, allowing the discontinuous construction.[23]

(59) a. Juan y Maria s' ecribieron cartas.
'Juan and Maria wrote cards to each other.' (Nec. symmetric)
b. Juan s' ecribio con Maria.
'Juan and Maria wrote (corresponded)'
c. * Juan s' ecribio cartas con Maria.

It is possible to observe the same phenomenon in German. While there is considerable variation in judgements, speakers who allowed (60b) did not allow an accusative argument to co-occur with the discontinuous construction.

(60) a. Hans und Maria haben sich diese Briefe geschrieben.
'Hans and Maria wrote each other these letters.'
b. % Hans hat sich mit Maria geschrieben.
'Hans and Maria wrote each other.'
c. * Hans hat sich diese Briefe mit Maria geschrieben.

The simplest analysis is to conclude that the above reciprocal strategies can apply in two different modes, and that examples (59c) and (60c) are ill-formed because they require a mix of properties of both. In the theory of Reinhart and Siloni, the two different modes are application in the lexicon and in the syntax.

While the connection between accusative assignment and application in the syntax is somewhat indirect and theory-dependent, a more direct demonstration of the connection between syntactic application and discontinuous use is also possible. With a little goodwill, several irreducibly symmetric reciprocals of German can be understood non-symmetrically. When that happens, two things follow: the non-symmetric version has compositional, rather than idiomatic meaning, and it cannot be used discontinuously. To put it the other way around, discontinuous reciprocals do not tolerate the non-symmetric reading.

While I have described *sich küßen* 'to kiss each other' as irreducibly symmetric (and it is so described in the literature), it can be understood as non-symmetric in the appropriate context. Imagine, after a story with a long build-up, that Hans kisses Maria, then takes a step back, then Maria kisses him.[24] Then an observer could say (61a). However, the discontinuous (61b) would then be ungrammatical: Only verbs of symmetric kissing can be used discontinuously.

(61) a. ...Hans und Maria haben sich (eindlich) geküßt.
Hans and Maria have Rcp finally   kissed
'Hans and Maria finally kissed.'
b. * ...Hans hat sich (eindlich) mit Maria geküßt.

Consider now the verb *sich schlagen,* which has the non-compositional meaning 'to fight'. German speakers have reported being able to get the following judgements:

(62)   Johann und Maria schlugen sich.
Johann and Maria hit   Refl/Rcp
a. 'Johann and Maria (each) hit themselves'   (Reflexive)
b. 'Johann and Maria fought'   (Idiomatic reciprocal, symmetric)
c. 'Johann and Maria hit each other, possibly on different occasions'
(Compositional reciprocal, non-symmetric)

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[23]While this is not the only possible analysis, any straightforward explanation will need to involve two modes of derivation, with different properties.

[24]This scenario, and some of the readings discussed in subsequent examples, were suggested by an anonymous reviewer.

(63) Johann schlug sich mit Maria
      Johann hit   Rcp with Maria
  a. * 'Johann and Maria (each) hit themselves'   (Reflexive)
  b.   'Johann and Maria fought'   (Idiomatic reciprocal, symmetric)
  c. * 'Johann and Maria hit each other, possibly on different occasions'
                                                      (Compositional reciprocal, non-symmetric)
  d.   'Johann used Maria as a club to hit himself' (Reflexive + instrument)

The simple (non-discontinuous) reciprocal in (62) can be interpreted as a reflexive, as an irreducibly symmetric reciprocal with the idiomatic meaning 'to fight', or as a compositional, non-symmetric reciprocal meaning 'to hit one another (possibly on different occasions)'. The discontinuous version in (63) loses the compositional meaning (c).[25]

It can be seen that irreducible symmetry goes together with the non-compositional meaning for the reciprocal verb; this lends support to an analysis along the Reinhart and Siloni line: The application of *sich* can evidently take place either in the lexicon, giving an unpredictable irreducibly symmetric meaning, or else compositionally in the syntax.

Siloni (2002) points out that even French, which we have described as lacking the discontinuous construction, has a very few reciprocal verbs that have the hallmarks of "lexical" reciprocals. The verb *battre* 'beat' is in this category; again, it has a compositional meaning that is not irreducibly symmetric, and a symmetric idiomatic meaning. Only the idiomatic meaning can be used discontinuously.

(64) a. battre 'beat'
      b. se battre = to quarrel (lexically derived)
      c. se battre = to beat each other (syntactically derived)

(65) Jean se bat avec Marie.
      a.   'Jean quarrels with Marie.'
      b. * 'Jean and Marie beat each other.'

The Serbian sentence (57), presented earlier, is another example of the same effect. It was mentioned in passing there that the reciprocal *se cuje* has the idiomatic secondary meaning 'to talk to each other'. The discontinuous reciprocal is compatible with this meaning, but not with the compositional meaning 'to hear each other'.

(57) 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
         'John and Maria talk (to each other)' (secondary meaning)
         (Cannot mean: 'John and Mary hear each other')

3.6 Statives and simultaneity

We have seen that we can use discontinuous reciprocals to distinguish irreducibly symmetric from sequentially interpreted reciprocals (of hitting, for example). Could the crucial factor be simultaneity versus sequentiality, rather than irreducible symmetry? It is easy to show that it it not. Individual level predicates must hold simultaneously when reciprocal, but they cannot be used discontinuously if they are not irreducibly symmetric. Thus the symmetric *sich verstehen* 'to get along' can be used discontinuously, as example (66) shows; but the non-symmetric *sich haßen* 'to hate each other' cannot.

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[25]The discontinuous version gains the irrelevant instrumental reading (d); note that this could *not* be described as a discontinuous reflexive: A discontinuous reflexive would have reading (a), "Johann and Maria (each) hit themselves", which is unavailable.

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

(67) 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 it is indeed irreducible symmetry, not simultaneity of the reciprocal relations, that determines whether a reciprocal can be used discontinuously.

3.7 The Bantu reciprocals

While the correlation between symmetry and discontinuous reciprocals strongly suggests a connection of some sort between the two constructions, unfortunately it does not hold universally. The Bantu languages Swahili, Chicheŵa and Ciyao allow the discontinuous reciprocal construction, but it seems that irreducible symmetry is not required. As sentence (68b) shows, the Swahili discontinuous reciprocal can refer to symmetrical or asymmetrical kissing; the remaining examples use the discontinuous construction in asymmetrical situations.[26]

(68) a. Juma na Rosa wa-li-busi-ana   (mashavu-ni)   (Swahili; D. George)
     Juma and Rosa SM-Pst-kiss-Rcp cheeks-Loc
     'Juma and Rosa kissed each other (on the cheek)'
   b. Juma a-li-busi-ana   na   Rosa (mashavu-ni)
     Juma SM-Pst-kiss-Rcp with Rosa cheeks-Loc
     'Juma and Rosa kissed each other (on the cheek)'

(69) Mtoto wa mwindaji a-li-fuat-ana   na   baba yake mpaka mawindoni. (Swahili; Kamusi)
   child of hunter   SM-Pst-follow-Rcp with father his up.to hunting.grounds
   'The hunter's child followed his father to the hunting grounds'

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

(71) Diguluve dí-kú-wúlág-an-a   ní   n'óombe.   (Ciyao; Mchombo and Ngunga 1994)
   5-pig   5SM-Pres-kill-Rcp-FV with 9-cow
   'The pig and the cow are killing each other'

A slight complication is that the form *-fuatana* can mean 'to follow one another' (reciprocal) but also 'to go together' (collective). But sentence (70), for example, clearly says that a life of excesses will *eventually* lead to ill health, not that disease and partying are found together.

It is not surprising that the suffix *-ana* does not enforce a symmetric event reading: It is the primary reciprocal strategy in Swahili and Ciyao, as in many other Bantu languages, and a symmetricization requirement would severely limit its usefulness. But the discontinuous construction is not a functional necessity: It is impossible with all the argument reciprocals I have considered, and many languages (e.g., Dutch) have no reciprocal strategy that allows it. The question, then, is why these languages have discontinuous reciprocals without irreducibly symmetric events.

Mchombo (1993) and Mchombo and Ngunga (1994) suggest that the construction is useful as a means of sidestepping the difficulty of choosing the verbal agreement marker that should be used with a conjunction of NPs of different genders. While this may be a real benefit of the comitative construction

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[26]Examples (69) and (70) are from the Internet Living Swahili Dictionary (Kamusi Project) and the Standard Swahili-English Dictionary (Johnson et al. 1939), respectively.

in general, discontinuous reciprocals are widespread cross-linguistically, including languages that have no difficulty conjoining NPs of different genders (or that have no genders at all).

The Bantu reciprocals differ in two salient ways from the other reciprocals we have considered, which only allow the discontinuous constuction with symmetric events. First, they are the primary reciprocal strategy rather than a "middle" strategy with limited applicability. Second, the Bantu suffix *-ana* belongs to the reciprocal-collective, rather than reciprocal-reflexive, polysemy type;[27] In most of the languages we have considered, the reciprocal strategies in question were polysemous between reciprocal and reflexive meanings. The discontinuous construction disambiguates the interpretation, forcing the reciprocal interpretation (cf. examples (62–63)), but nevertheless this leaves open the possibility that the difference between the European-style and the Bantu reciprocals is somehow connected to polysemy type. In this respect Lao forms a neat minimal pair with our Bantu cases: In Lao, *kan3* is both the primary strategy and of the reciprocal-collective polysemy type, just like Swahili *-ana*; nevertheless in Lao the discontinuous construction is limited to naturally reciprocal verbs.[28]

Thus the Bantu examples are unique in allowing discontinuous reciprocals without being irreducibly symmetric; since I do not know how to account for their status, I will put them aside and develop an analysis of the other languages, which cleary show a close connection between irreducible symmetry and the discontinuous construction, with the caveat that it does not extend to the above reciprocals from Bantu.

4   The structure of discontinuous reciprocals

Reciprocal verbs appear to be intransitive. When they are used discontinuously, it is generally argued that the comitative phrase is somehow added to ("augments") the apparent subject of the reciprocal verb, leading to an interpretation that is essentially like that of the corresponding simple reciprocal; for example, the discontinuous reciprocal (72a) is said to be interpreted equivalently to the simple reciprocal (72b).

(72) a. O   Yanis filithike   me ti Maria.
          the John kissed-Rcp.Sg with the Maria
          'John and Maria kissed each other'
      b. O   Yanis kje i   Maria filithikan.
          the John and the Maria kissed-Rcp.Pl
          'John and Maria kissed each other'

As Frajzyngier (1999) puts it, "If a [comitative] argument is present, the scope of the reciprocal is automatically extended to include the other argument as a co-participant." Accordingly, analyses of the construction have aimed at assimilating it to the simple reciprocal structure. Vitale (1981:145–152), after lengthy examination of the discontinuous reciprocal construction, concludes that it is transformationally related to the simple reciprocal. Mchombo and Ngunga (1994) characterize discontinuous reciprocals as a form of extraposition from a conjoined subject, "yielding what is essentially a comitative construction."[29] Siloni (2001) points out that comitative phrases are possible with non-reciprocal verbs as well, and argues that discontinuous reciprocals "utilize a mechanism available to verbs in general." However, I will show that the semantics of discontinuous reciprocals are more restricted (that is, more expressive) than those of the corresponding simple reciprocal, and therefore they cannot be reduced to those of

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[27]Collective construals are quite limited in Swahili, but are still detectable in certain lexicalized contexts.

[28]Lao and Swahili reciprocals differ in that the former is expressed as a separate word while the latter is a verbal suffix. But since we have considered plenty of other languages with suffix reciprocals that do behave as predicted, there is no reason to believe that this difference would be relevant.

[29]In many Bantu languages, including Ciyao and Swahili, a single preposition is used in place of the English prepositions *by* and *with* and the conjunction *and.*

simple reciprocals. Discontinuous reciprocals must therefore be interpreted as two-place predicates.[30]

4.1 The general-purpose adjunct analysis

One possibility that we must rule out is that discontinuous reciprocals are nothing more than ordinary reciprocals with a comitative adjunct. Siloni (2001) pointed out that comitative phrases are possible with non-reciprocal verbs as well, and suggested that discontinuous reciprocals may "utilize a mechanism available to verbs in general."[31]

(73) Dan nika   et ha-bayit (im Ron)   (Hebrew)
     Dan cleaned Acc the-house (with Ron)

Under this view, a discontinuous reciprocal is no different from a sentence like (73). The question would become why French-style languages do *not* allow discontinuous reciprocals; Siloni suggested that this might be the result of a ban against split antecedents.

But it is easy to discover evidence against such an analysis. To begin with, such comitatives of "accompaniment" do not require the comitative participant to undertake the action described by the predicate. In example (74b), the comitative participant was present during John's riding to the store but did not necessarily participate in riding.

(74) a. John and Mary rode to the store together.
     b. John rode to the store with Mary.
        ≢ Mary rode to the store.
        (Mary might have run alongside, or sat on the back of John's bike)

Discontinuous reciprocals, on the other hand, have more precise semantics. The comitative participant must be engaged in the stated reciprocal relationship with the subject of the reciprocal.

Rákosi (2003) gives some additional arguments for Hungarian. The contrast in (75) shows that while two ordinary comitative adjuncts cannot co-occur in a single clause, a discontinuous reciprocal can have one additional comitative adjunct.[32] Rákosi also argues that the comitative arguments of discontinuous reciprocals "denote participants that are causally affected", something that is not required in ordinary comitative adjuncts.

(75) a.   Péter-rel $^?$(együtt) ritkán veszeked-t-em Kati-val.
          Peter-with together rarely quarrel-Pst-1sg Kate-with
          'I rarely quarreled with Kate together with Peter'
     b. * Péter-rel   (együtt) ritkán fut-ott-am   Kati-val.
          Peter-with together rarely ran-Pst-1sg Kate-with
          'I rarely ran with Kate together with Peter'

We have also seen that the discontinuous construction is possible only with the *reciprocal* meaning of ambiguous reflexive/reciprocal constructions. The discontinuous version of German example (76) forces reciprocal interpretation.

(5) a. Johan und Maria schlugen sich.   (German)
       Johan and Maria hit   Refl/Rcp
       'Johan and Maria hit themselves/each other'

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[30]This conclusion is indirectly bolstered by the work of Evans (2004), who argues that detransitivization is not inextricably associated with reciprocal formation, but should be studied as a contingent property. Evans cites examples from Australian languages in which reciprocal verbs behave as transitives, assigning ergative to their subject or even in some cases retaining an overt object.

[31]In later work, Siloni (2002) treats the discontinuous reciprocal as a distinct construction.

[32]Sentence (75b) is grammatical (only) if the preposed comitative has special topic-like intonation, in which case it has the meaning "Like Peter, I rarely run with Kate" (György Rákosi, personal communication).

    b. Johan schlug sich   mit Maria
       Johan hit   Rcp/*Refl with Maria
       'Johan and Maria hit each other/*themselves'

It would be difficult to reconcile this with an adjunction analysis in a principled way. There is no reason to suppose, for example, that split antecedents might be acceptable for the reciprocal, but not the reflexive use of German *sich*.

    We will see that considerations of interpretation also argue against this solution.

4.2   The extraposition analysis

Mchombo and Ngunga (1994) characterize discontinuous reciprocals as a form of extraposition from a conjoined subject, "yielding what is essentially a comitative construction."[33] They relate the construction to the problem of conjunction between nouns of different noun classes: Evidently Ciyao does not assign a default noun class to conjunctions of different classes, and the verb in example (76a) cannot agree with its subject.

(76) a. * Diguluve ní   n'óombe ?-kú-wúlág-an-a
             5-pig   and 9-cow   ?-Pres-kill-Rcp-FV
      b.   Diguluve dí-kú-wúlág-an-a   ní   n'óombe.
          5-pig   5SM-Pres-kill-Rcp-FV with 9-cow

Although the discontinuous reciprocal is unquestionably useful as an alternative to conjunctions such as (76a), this does not appear to be its primary function. We have seen that discontinuous reciprocals are attested in a considerable number of languages that do not restrict the conjunction of NPs of different genders (including Hebrew, Russian, German, Greek, etc.), or that have no gender and therefore no need to resolve gender mismatches (Hungarian).

    Conversely, we might expect the discontinuous construction to be available in other environments where conjunction of different genders gives rise to an agreement problem; but this is not the case. In example (77), from Serbian, an argument reciprocal must agree in gender with the the conjunction of a masculine and a feminine antecedent; in principle, it should carry neutral agreement, but the result is not judged particularly well-formed. Nevertheless a discontinuous complement is completely impossible.

(77) ?? Petar i   Marija su   udarili jedno drugo.
        Peter and Maria Aux kicked each-other(Neut)
        'Peter and Maria kicked each other'

Therefore we treat discontinuous reciprocals as a specifically reciprocal construction, not as a type of extraposition or conjunction, and follow Maslova (forthcoming) in considering them to be a type of reciprocal distinct from simple reciprocals. Moreover I distinguish between the comitative *argument* of discontinuous reciprocals and comitative *adjuncts* elsewhere.

4.3   The distinctness of the two arguments

If we examine the interpretation of discontinuous reciprocals in some detail, it can be seen that subject and comitative oblique retain their syntactic and semantic identity at all levels of representation. I will provide two types of evidence, syntactic and semantic. In both cases we find the same behavior in the discontinuous reciprocals of numerous languages.

    For syntactic evidence, we can look at embedding constructions that target the subject; when applied to a discontinuous reciprocal, we find that they invariably target its syntactic subject, not a hypothetical conjunction of syntactic subject and comitative oblique. Consider first the causativization construction in Swahili, expressed through a derivational suffix on the verb. In example (78b), it is only the speaker

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[33]In many Bantu languages, including Ciyao and Swahili, a single preposition is used in place of the English prepositions *by* and *with* and the conjunction *and.*

(the subject of the basic, un-causativized sentence), that has been made to compete with Mike Tyson; there is no implication that Mike Tyson was subjected to any pressure. Therefore causativization targets the syntactic subject only, not the comitative oblique. This contradicts, in particular, the extraposed conjunction analysis of Mchombo and Ngunga (1994).

(78) a. Ni-li-shind-an-a   na   Mike Tyson.   (A. Shariff, p.c.)
       SM-Past-overcome-Rcp-FV with Mike Tyson
       'I competed with Mike Tyson'
    b. A-li-ni-shind-an-ish-a   na   Mike Tyson.
       SM-Past-OM-overcome-Rcp-Caus-FV with Mike Tyson
       'He made me compete with Mike Tyson'
       (*Not:* 'He made me and Mike Tyson compete with each other')

Similarly, certain participles in Greek are obligatorily subject-oriented. The participle *kapnizondas* 'smoking' cannot modify the accusative object (the guard) in (79a), or the instrumental phrase (the car) in (b); it also cannot refer to the comitative argument *Maria* in the discontinuous reciprocal(c). Example (d) shows that the participle *can* refer to all parts of the plural subject of a simple reciprocal.

(79) a. O   Nikos kitaze   ton fruro kapnizondas.
       the Nick   looked.at.Ipf the guard smoking
       'Nick, while smoking, was looking at the guard'
    b. O   Nikos irthe me   to   aftokinito kapnizondas.
       the Nick   came with the car   smoking
       'Nick, while smoking, came with the car'
    c. O   Nikos milise   me   ti   Maria kapnizondas.
       the Nick   spoke.Sg with the Maria smoking
       'Nick, while smoking, spoke with Maria'
    d. O   Nikos kje i   Maria milisan kapnizondas.
       the Nick   and the Maria spoke.Pl smoking
       'Nick and Maria, while smoking, talked'

We can observe analogous behavior in English: absolute constructions target only the syntactic subject in (80a).

(80) a. Sneaking past the principal, John finally met with Mary.
       (= John snuck past the principal)
    b. Sneaking past the principal, John and Mary finally met.
       (= John and Mary snuck past the principal)

The instrumental phrase in Hebrew example (81) only applies to Mary (the syntactic subject), not the comitative *John* (Siloni (2004)).

(81) Dan hitkatev   im   Dina be-et nove'a
      Dan corresponded with Dina in-pen fountain
      'Dan corresponded with Dina using this fountain pen.'

These syntactic constructions, then, treat subject and comitative oblique as separate entities. Turning to semantics, we consider examples in which either the syntactic subject or the comitative argument of a discontinuous construction denotes a plural NP, as in the (b) sentences below.

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

(83) a. O Yanis, o Nikos kje i Maria tsakothikan
        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 (82a) describes a situation in which hugs were exchanged between various pairs of children, regardless of gender (although a reading in which the boys only hugged girls is also possible, see below). But the (b) example only talks about hugs involving a boy and a girl; there is no mention of a boy hugging other boys, or a girl hugging other girls. Similarly, (83a) refers to strife between the three members of the subject, with no specification of which party or parties was in conflict with whom. But (83b) 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. This phenomenon has tended to escape mention in the (small) literature on discontinuous reciprocals. One of the few to remark on it is Frajzyngier (1999), who provides the following example and commentary:

(84) Spotkamy   się na Nowym Świecie z   Michałem.   (Polish)
      meet.1pl.Fut Refl on (street name)   Conj Michal.Instr
      'We shall meet Michal on Nowy Świat'
      "The first participant is plural but members of its set are not in reciprocal relationship to each other, but rather all are in reciprocal relation with Michal." (Frajzyngier 1999)

If the comitative phrase was interpreted as part of the logical subject of the reciprocal, (84) should be equivalent to "We will meet each other, and we will meet Michal and Michal will meet us, on Nowy Swiat". But "we will meet each other" is not in fact part of its meaning.

We see then that the correct meaning of the discontinuous reciprocal differs from that of the corresponding simple, one-argument reciprocal; moreover, no simple reciprocal can accurately render the meaning of the above discontinuous examples without loss of information. We must conclude that the comitative phrase is *not* interpreted as part of the logical subject of the reciprocal, but as a separate argument.

To be more precise, there are two requirements for an adequate account of the discontinuous reciprocal semantics. The first is that the (syntactic) subject and comitative argument must be distinguishable at the level of semantic interpretation; the second is that the semantics we assign to our reciprocals must utilize the two distinct arguments. We now take up each of these points in the following sections.

4.4   The interpretation of conjoined NPs

We have seen that the (surface) subject and the oblique argument of the discontinuous reciprocal must be distinguishable in the semantics; but might not the two elements be distinguishable parts of a single syntactic entity? Perhaps such constructions involve (at some appropriate syntactic or semantic levels) a structured entity that is subdivisible into the appropriate subparts; the subject of (39b) 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 $<\text{Maria}>$. An analysis along such lines seems to be supported by examples with a conjoined subject, such as (85a). The most obvious interpretation of this example is that the animals were separated into two groups, one consisting of the cows and the other consisting of the pigs. Sentence (b), on the other hand, does not suggest a criterion for the separation into groups: they may have been separated by age, by color or by gender, for example. It seems that the internal structure of the conjoined NP *the cows and the pigs* is reflected in the semantics of sentence (a).

(85) a. The cows and the pigs were separated (from each other).
    b. The animals were separated from each other.

However, Schwarzschild (1996) shows that such an analysis of (85) is not sustainable: the two sentences above should be treated identically at the semantic level. The difference in their interpretation is due to a discourse effect triggered by the structure of the subject, and can be easily overridden by appropriate disambiguation. Example (86) might describe a division into white animals and black animals, regardless of species.

(86) The cows and the pigs were separated according to color.

Schwarzschild concludes that the conjunction of two plural NPs is simply a set containing all individuals in the conjoined NPs, with no intermediate structure. In his analysis, the organization into intermediate groups is reflected in the contextually-determined choice of a "cover," which groups the animals according to some appropriate criterion. If the sentence or prior context does not explicitly specify a criterion, the form of the subject may suggest one; a conjoined subject, for example, suggests a cover consisting of the conjuncts. Depending on suitable context, other covers might group each animal individually, or group the animals by age, by owner, etc.

The conjunction of plural NPs, then, must be treated as a homogeneous semantic entity, although there may be pragmatic consequences to its structure. We cannot treat conjoined plural NPs as structured entities, or "groups", at least as far as reciprocals and distributive predicates are concerned. (In other words, I do not rule out that group structure may be relevant to other phenomena).

When an oblique argument is used instead of a conjoined subject, however, a different pattern emerges: The relation being described must respect the division into syntactic subject and comitative oblique, and this condition cannot be pragmatically overridden. Example (87) cannot change the criterion for division by including the modifier *according to color:* the separation *must* put the cows in one group and the pigs in another.[34]

(87) The cows were separated from the pigs (*according to color).

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 Schwarzschild's argument was based will fail for discontinuous reciprocals.

This is the same phenomenon we have already observed in languages that have 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 to such an example. Greek sentence (82b), repeated below, can only describe hugs between a boy and a girl, not hugs between boys or between girls.

(82b) 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 (88a), but not (88b).

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[34]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 stated criterion, color.

(88) 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)'
　　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 (88a) 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 (88b) cannot be used felicitously. 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 (87) 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. The proper analysis of sentence (88b) will then involve a *paired cover,* which Schwarzschild defines precisely to account for dependencies between the arguments of two-place predicates.

(89) T is a *paired cover* of a pair of sets $<A, B>$ if and only if:
　　There are covers C(A) of A and C(B) of B, and
　　a. T is a subset of $C(A) \times C(B)$
　　b. $\forall x \in C(A) \exists y \in C(B) : <x, y> \in T$
　　c. $\forall y \in C(B) \exists x \in C(A) : <x, y> \in T$

Each element of a paired cover is an ordered pair consisting of one element in the cover of the first argument and one element in the cover of the second; hence the division between the two arguments is respected in exactly the way we require. Schwarzschild (1996:87) appeals to paired covers for the desired reading of example (90), which relies on a cover pairing men and women into couples.

(90) Even though the couples in our study were not married, the men did display aggressive behavior towards the women.

The default paired cover for sentence (82b) includes arbitrary pairs of one boy and one girl, while in the context of sentence (88b) the paired cover includes only the pairs matching each boy with the girl who is his teammate; this is why the sentence is infelicitous if some teams are not boy-girl teams.

The non-discontinuous sentence (88a) is interpreted in terms of a simple cover, as Schwarzschild proposes for simple reciprocals in English. In the context we have set up, each element of its cover will contain the two members of a team; because elements are drawn from the union of all boys and girls together, this sentence is acceptable even if some teams are not boy-girl teams. Thus our findings are completely in line with Schwarzschild's system, as long as we treat discontinuous reciprocals as two-place predicates.

4.5　Comitative conjunction

In numerous languages, including several of the languages we have been considering, the comitative marker can be used to conjoin two NPs (in fact, for many languages this is the only means of conjunction; cf. Stassen 2000). Is it possible that such "comitative conjunction" has properties different from those of ordinary conjunction, and that discontinuous reciprocals should be in fact analyzed as discontinuous conjunction of this sort? For the case of Russian, at least, the work of Dalrymple et al. (1998a) suggests that this is not the case.

Several of the languages we have been discussing, including Greek, Russian and Hungarian, allow two NPs to be conjoined via *comitative conjunction* as an alternative to the familiar *coordinate conjunc-*

tion (Stassen 2000). Coordinate conjunction joins two NPs with equal rank, which are treated equally by case-marking and other processes; comitative conjunction joins two NPs of different ranks, by means of a *with*-like preposition that may case-mark one of the NPs. The following examples, from Haspelmath (2000), show that Russian has coordinate conjunction (b) as well as comitative conjunction (c).

(91) a. Masa prisla s Kostej. / Kto prisel s Kostej?   (comitative)
      'Masha came with Kostya. / Who came with Kostya?'
   b. Masa i Kostja prisli. / *Kto i Kostja prisli?   (coordinate ("i"-)conjunction)
      'Masha and Kostya came. /(lit.) Who and Kostya came?'
   c. Masa s Kostej prisli. / *Kto s Kostej prisli?   (comitative ("s"-)conjunction)
      '(lit.) Masha with Kostya came. / Who with Kostya came?'

Feldman (2001) shows that comitative conjunction in Russian is a phenomenon distinct from other comitative constructions, which adjoin a comitative phrase to a VP or equivalent. Comitative conjunction proper is distinguished by triggering plural agreement on the verb (when the comitative pair is the subject), by serving as a plural antecedent for reflexives and reciprocals, by resisting extraction, etc. In such cases, the comitative pair must be analyzed as a syntactic unit.[35] But discontinuous reciprocals involve a comitative phrase that behaves as a separate argument, and the verb agrees only with the syntactic subject.

Dalrymple et al. show that conjoined subjects of either the coordinate or the comitative type can be analyzed along the lines proposed by Schwarzschild, as homogeneous sets of atomic individuals with no intermediate structure; their syntactic structure may suggest a division into groups, but this division is not obligatorily observed by the semantic interpretation. Although comitative conjunction seems to more strongly suggest a division into its component parts, each of the following examples can either suggest an exchange of snowballs between boys and girls, or be taken to describe an indiscriminate exchange. (Examples (38) and (18) of Dalrymple et al. 1998a).

(92) a. Mal'čiki i   devočki   brosali drug v druga snežki.
      boys.Nom and girls.Nom threw   each at other snowballs
      '(The) boys and (the) girls threw snowballs at each other'
      i. individual vs. individual (preferred)
      ii. boys vs. girls
  b. Mužčiny s   ženščinami brosali drug v druga snežki.
      men.Nom with women.Inst threw   each at other snowballs
      '(The) men with (the) women threw snowballs at each other'
      i. men vs. women (preferred)
      ii. individuals

While this might seem to suggest that a covers analysis *can* apply to discontinuous reciprocals as well, we have seen that comitative conjunction and the comitative obliques of discontinuous reciprocals are two separate constructions. Dalrymple et al. (1998a) do not discuss discontinuous reciprocals at all; in fact, their reciprocal examples do not involve reciprocal verbs, but use the argument reciprocal *drug v druga* (and we have seen that only verbal reciprocals can be used discontinuously). Therefore there is no conflict between the findings of Dalrymple et al. and the conclusions we have reached here. Since the interpretation of discontinuous reciprocals must necessarily respect the division into subject and comitative complement, discontinuous reciprocals cannot be analyzed as covert conjunction, of either the coordinate or the comitative kind. A conjunction analysis would predict more flexibility than is actually present.

We have already seen, in section 4.3, that the syntactic subject and the comitative argument of discontinuous reciprocals are treated as separate constituents by various syntactic operations. The evidence

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[35]Russian also allows verbs to agree with just the head of a comitative conjunction subject. Feldman shows that this is a different kind of construction, with the properties of ordinary comitation (such as allowing extraction).

of Russian argues against the possibility that comitative conjunction might be somehow different from coordinate conjunction in ways that could account for the properties of discontinuous reciprocals. Once again, we conclude that subject and comitative oblique should be treated as separate arguments.

4.6 Argument reciprocals

The analysis of discontinuous reciprocals as two-place predicates can explain why, as we have seen, only verbal reciprocal strategies can be used discontinuously. An argument reciprocal necessarily saturates the internal argument of the verb, and so cannot cooccur with a comitative oblique that would need to be associated with the same logical argument.

In section 3.5 we pointed out that only reciprocal strategies applying in the lexicon can introduce irreducibly symmetric semantics. This might suggest an alternative explanation: If irreducible symmetry can only be introduced in the computational lexicon (i.e., by an operation on the lexical entry of the verb), then it can never be introduced by argument reciprocals since these only combine with the verb during syntactic derivation. But while this statement is presumably correct, it is not enough to explain why argument reciprocals can never be used discontinuously: it would lead to the prediction that if we form an argument reciprocal from a transitive verb with irreducibly symmetric semantics, such as *meet,* the result could be used discontinuously. This is not the case: such examples are completely ungrammatical.

(93) a. * O Yanis synandise o   enas ton alo   me ton Niko.
the John met   the one the other with the Nick
(intended: 'John met with Nick')
b. * John met each other with Nick.

The impossibility of using such reciprocals discontinuously must therefore have a structural explanation, not a purely semantic one.

5   A semantics for irreducibly symmetric reciprocals

In section 3 we saw that in a large class of typologically unrelated languages, the discontinuous construction is only possible with reciprocals that have irreducibly symmetric meaning. Despite the fact that the Bantu reciprocals we considered form a conspicuous exception, this generalization is intriguing, and suggests a semantics that would account for the semantics of discontinuous and "simple" symmetric reciprocals in a uniform way. I will sketch such an account in this section, putting aside for the time being the Bantu system.

We have seen that discontinuous reciprocals involve two arguments, a subject and a comitative oblique, which retain their syntactic and semantic identity. Because the two remain separated in the proposition expressed by the discontinuous reciprocal, it is necessary that our semantics should treat them as distinct arguments. In other words, we must treat discontinuous reciprocals as being semantically two-place verbs. This conclusion goes against the semantics usually given to reciprocals, which allows for just one argument (Heim et al. 1991a,b, Dalrymple et al. 1994, and others). For example, the theory of Heim et al. (1991a) assigns essentially the following interpretation to the reciprocal predicate *love each other*:

(94) love each other $= \lambda X \, \forall x \in X \, \forall y \in X \, (x \neq y \Rightarrow \mathrm{loves}(x, y))$ (cf. Heim et al. 1991a)

In fact this is a simplified version of the formula that Heim et al. actually use. Their own formula uses different sets for the domains of the variables x and y; the domain of y is represented by an open variable, which is however required by Binding Principle A to be bound by the subject of the reciprocal predicate. In this way the two variables are constrained to range over the same set. But for discontinuous reciprocals, as we have seen, we need the two sets to be able to range over different variables.

We begin by basing our analysis on that of Heim et al. (1991a), which is well-known and relatively simple but knowingly oversimplifies the question of which types of reciprocal situations may be de-

scribed by a reciprocal. This question is also largely orthogonal to our present concerns. In section 5.3, we will see how our analysis can be combined with more articulated treatments, which properly handle the issue of reciprocal situations.

Following Heim et al., sentence (95a) would be analyzed as in (b). This formula says that every child hugged all other children. The "distinctness condition" $x \neq y$ ensures that no child hugged himself.

(95) a. Ta agorja kje ta   koritsja angaljastikan
       the boys   and the girls   hugged-Rcp
       'The boys and the girls hugged each other'
    b. $\forall x \in \mathbf{boys} \oplus \mathbf{girls} \, \forall y \in \mathbf{boys} \oplus \mathbf{girls} \, (x \neq y \Rightarrow \mathrm{hugged}(x, y))$

As we have seen, this is not the right interpretation for the discontinuous variant, (96a). The correct semantics would be better approximated by (b), which allows the variables x and y (ranging over the subject and comitative argument of the predicate, respectively) to range over different sets. But this is not quite correct either, since it does not express the property of irreducible symmetry that characterizes both sentences.

(96) a. Ta   agorja angaljastikan me   ta   koritsja.
       the boys   hugged.Rcp   with the girls
       '(The boys were in a hugging relation with the girls)'
    b. $\forall x \in \mathbf{boys} \, \forall y \in \mathbf{girls} \, (x \neq y \Rightarrow \mathrm{hugged}(x, y) \,\&\, \mathrm{hugged}(y, x))$

I propose that the core function of a symmetric reciprocal strategy is not to detransitivize the verb and introduce reciprocal semantics over its remaining argument, but simply to create an irreducibly symmetric predicate. The roles of the two participants become necessarily identical, but the participants remain distinct. The result is an irreducibly symmetric two-place predicate, which may appear in the syntax as a two place predicate (a discontinuous reciprocal) or may undergo a second, optional operation, which causes its two logical arguments to be identified and results in the "simple" reciprocal structure. In effect, symmetric simple reciprocals are derived from discontinuous reciprocals, not the other way around. To summarize:

(97) **Proposal (for irreducibly symmetric reciprocals):**
    a. The function of the core reciprocalization operation is to create an irreducibly symmetric predicate. The roles of the two participants in an event become necessarily identical, but the participants remain distinct.
    b. Non-discontinuous ("simple") reciprocals are derived by application of an additional operation, which causes the two semantic arguments of the reciprocal to be identified.

Recall the definition of irreducibly symmetric predicates:

(32) **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.

It relies on the notion of *symmetric events,* which have two arguments with necessarily identical participation. There are problems formalizing this notion: the usual notion of theta roles allows only a unique participant, singular or plural, to fulfil each role, and most formalizations of event semantics rely on this condition to avoid generating incorrect entailments (cf. Parsons 1990). Here we will follow Krifka (1992), who treats uniqueness of this sort as a contingent property of some verb types only, but will not present an actual solution to the problem of how to represent non-unique roles. Instead, we will use the following informal notation for the "symmetricization" of a transitive verb:

(98) $\mathrm{Symm}(V)(x, y)$ iff $\exists e \, (V(e, x, y) \,\&\, V(e, y, x))$
    (E.g., x symmetrically-kisses y if there exists an event e which is an event of x kissing y **and** of y kissing x).

This notation introduces an abbreviated reference to events, and indicates that in every event to which the symmetricized predicate applies, each participant acts in both roles.

We can then write an abbreviated semantics for the core effect of *symmetric reciprocalization* as in (99), modeled on the analysis of Heim et al. (1991a).

(99) $\text{SRecip(V)} = \lambda R\,\lambda S\,\forall x \in S\,\forall y \in R\,(x \neq y \Rightarrow \text{Symm}(V)(x,y))$

The core reciprocalization operation can be further decomposed, although I do not do so here. In particular, the above formula includes the condition $x \neq y$, which enforces the distinctness of the two participants in each event; but it is not clear that distinctness should be written in at this level. Beck (1999) shows that irreflexivity (i.e., the distinctness condition) has the status of being presupposed, rather than asserted, by the reciprocal operator.[36] Nevertheless, since it is possible to reciprocalize verbs that are not irreflexive (one can hug oneself), our symmetric reciprocalization operator must introduce the distinctness condition in *some* fashion. Otherwise our symmetric reciprocal verbs would lack a distinctness condition altogether, even when used in a simple (non-discontinuous) sentence, and we would accept *the children hugged* as true even if many children only hugged themselves. For simplicity, I follow Heim et al. (1991a) and include the distinctness condition as an assertion in the denotation of the reciprocalization operator itself.

The operator *SRecip,* in combination with syntactic effects such as withdrawal of accusative case assignment (cf. section 2.3, and Reinhart 2002), is involved in the derivation of all symmetric reciprocals. While it is sufficient for the semantics of discontinuous reciprocals (if we assume that the comitative preposition is semantically transparent), simple reciprocals are derived by application of an additional operation, which causes the two semantic arguments of the output of (99) to be identified. We can assume that this argument identification operation is formally identical to reflexivization, which creates reflexive verbs by identifying two argument positions (Reinhart 2002).

(100) $\text{Refl}(\lambda x\,\lambda y\,V(x,y)) = \lambda x\,V(x,x)$

The composition of reciprocalization and argument identification (i.e., of *SRecip* and *Refl*) gives us a traditional, one-argument reciprocal formula but with irreducibly symmetric semantics:

(101) $\text{Refl(SRecip(V))} = \lambda R\,\forall x \in R\,\forall y \in R\,(x \neq y \Rightarrow \text{Symm}(V)(x,y))$

The above formulas are only meant to describe particular (verbal) reciprocal strategies, those that require an irreducibly symmetric interpretation. It is not appropriate for non-symmetric reciprocals, such as those formed by *each other,* or even for verbal reciprocals that do not take on irreducibly symmetric semantics. In Greek, reciprocal verbs formed with the passivization strategy have irreducibly symmetric meaning, but argument reciprocals and reciprocal verbs formed with *alilo-* do not. In German, *sich-* reciprocals with irreducibly symmetric semantics would be interpreted as above, but those with ordinary reciprocal semantics must continue to receive an analysis along the usual lines (e.g., of Heim et al. 1991a).

While the existence of two different translations of *sich* is not an ideal state of affairs, the fact is that German can use *sich* to form two kinds of reciprocals, symmetric and non-symmetric, even from one and the same verb. The two translations reflect this property of the language. The Reinhart and Siloni analysis provides us with a way to account for this meaning difference: If the operator can apply either in the lexicon or in the syntax, it may avail itself of the different formal manipulations available in the two domains.

To illustrate the operation of the formulas defined above, we show below how the interpretation of a discontinuous and a simple reciprocal is analyzed:

(96a) Ta agorja angaljastikan me ta koritsja.
     the boys hugged.Rcp with the girls
     '(The boys were in a hugging relation with the girls)'

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[36]Hackl (2002) argues that covertly reciprocal relational nouns, such as *are next-door neigbhors,* are derived from the corresponding transitive variants (*X is a next-door neighbor of Y*) without loss of information, whenever their basic meaning is irreducibly symmetric and irreflexive. (For example, nobody can be his own next-door neighbor). The relation of these findings to the verbal domain, and the exact relationship between irreflexivity and symmetry in general, need further investigation.

(102) Sentence (96a) = SRecip(hug)(boys, girls) =
$\forall x \in \mathbf{boys}\, \forall y \in \mathbf{girls}\, (x \neq y \Rightarrow \mathrm{Symm}(\mathrm{hug})(x, y))$

(95a) Ta agorja kje ta koritsja angaljastikan
the boys and the girls hugged-Rcp
'The boys and the girls hugged each other'

(103) Sentence (95a) = Refl(SRecip(hug)) + (boys ⊕ girls):

    a. $\mathrm{SRecip}(\mathrm{hug}) = \lambda R\, \lambda S\, \forall x \in S\, \forall y \in R\, (x \neq y \Rightarrow \mathrm{Symm}(\mathrm{hug})(x, y))$

    b. $\mathrm{Refl}(\mathrm{SRecip}(\mathrm{hug})) = \lambda R\, \forall x \in R\, \forall y \in R\, (x \neq y \Rightarrow \mathrm{Symm}(\mathrm{hug})(x, y))$

    c. Refl(SRecip(hug))(boys ⊕ girls) =

$$\forall x \in \mathrm{boys} \oplus \mathrm{girls}\, \forall y \in \mathrm{boys} \oplus \mathrm{girls}\, (x \neq y \Rightarrow \mathrm{Symm}(\mathrm{hug})(x, y))$$

The analysis described above is intended as a first approximation. For simplicity, the above formulas were based on the treatment of Heim et al. (1991a), which forces a strong reciprocity interpretation; but it is straightforward to adapt this analysis to a treatment of reciprocals designed to allow other interpretations. We will do this in section 5.3.

5.1 The second argument

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 (104) refers to a single event of kissing, each of whose participants was both kissing and being kissed.

(104) 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.

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

(106) 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. 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 for modifiers that target the subject only (as we saw in section 4.3, such phenomena provide evidence that the two positions are distinct arguments).

(107) 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'

This does not seem to be the entire story, however. Sentences like the following seem odd, even if we imagine an interest in garages or trees.

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

Gleitman et al. suggest that symmetrical comparisons, like ordinary predicates, have a Figure-Ground structure; whichever participant appears on nonsubject position becomes the Ground. Thus (108a) is odd because we do not use a moveable object to fix the location of an immoveable building; sentence (108b) is odd because the car must be the active participant in any collision scenario. 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 (109a) might be understood to say that China is isolationist like North Korea, while example (b) might be saying that North Korea shares some lasient property of China. Gleitman et al. show that if we explicitly include the standard of comparison, as in (110), the difference between the two versions disappears.

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

(110) 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.

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 (111a) if John forced the kiss on Mary. It is also odd to say (111b) 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.

(111) 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 (112b), the discontinuous version of (111b), to be acceptable.

(112) 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'

This is a subtle effect that does not seem to hold universally in other languages. My consultants reported the Hebrew and Serbian equivalents of (112b) to be ill-formed; Rákosi (2004) reports that while he initially disliked the same example in Hungarian, he later came to consider (113b) well-formed.

(113) 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).

(114) 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 it-self; 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 the two positions are thematically identical, in the sense of having the same thematic rela-tionship with the lexical verb; additional requirements on the subject will be considered to be associated with its syntactic position (thus we might treat them as introduced by some other functional heads).

Reinhart and Siloni (2003) adopt an analysis along these lines: lexical reflexivization works by "bundling" two theta roles into a single, complex one, e.g. [Agent-Theme]. Both arguments of a discon-tinuous reciprocal are assigned the same bundled role. Rákosi (2003) proposes an alternative analysis, which only indirectly associates the participants with both roles. He assigns to the comitative argument the special role *Partner,* while the subject is only assigned one theta role, e.g., Agent.

5.2   The syntax of the comitative argument

If the comitative argument of the discontinuous reciprocal is a true argument of the verb, why is it ex-pressed as an oblique? One possibility is that this is simply an accident; as discussed in section 2.3, Reinhart (2002) shows that operations of the lexical reciprocalization type suppress the assignment of accusative Case by the verb, even to arguments that were not targeted by the operation. Therefore the reciprocalized verb cannot Case-license *any* arguments, and a different licenser is needed for the comi-tative argument.

One complication is that some irreducibly symmetric predicates that are not marked as reciprocals can nevertheless be used discontinuously; in those cases, the comitative marker is employed although we have no evidence that an Accusative-suppressing operation has applied. In Greek, for example, the morphologically non-reciprocal verb *sinorevi* 'borders on' must be used as a reciprocally interpreted intransitive, or with a comitative second argument.[37]

(115) a. I   Rosia kje i   Kina sinorevun.
          the Russia and the China border.Pl
          'Russia and China have border in common.'
      b. I   Rosia sinorevi me   tin Kina.
          The Russia border.Sg with the China
          'Russia has a border in common with China'

This behaviour is encountered in many of the languages we have been discussing (cf. Rákosi (2003) for Hungarian), although some languages are more consistent than others in marking all symmetric relationships as reciprocal. This suggests that the discontinuous construction is not licensed by the re-ciprocalization operation itself, or some syntactic side-effect of it, but by the property of irreducible symmetry. Hence it is also licensed for non-reciprocal predicates that are irreducibly symmetric.[38]

However, Siloni (2004) argues that the ability to be used discontinuously is a direct consequence of lexical reciprocalization, and that symmetric verbs that are not overtly reciprocal-marked might still

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[37]Since Greek marks symmetric reciprocal verbs with morphological passive, "non-reciprocal" means that such verbs are morphologically in the active voice. Other such verbs are *xorizo* 'separate, divide', and *simfono* 'agree'. None of these verbs can be used as a transitive: they must either occur with a plural subject (which is interpreted reciprocally) or with a comitative complement.

[38]Needless to say, this conclusion makes it even more puzzling that some Bantu reciprocals can be used discontinuously even when non-symmetric.

have undergone a reciprocalization operation in the lexicon, but without its morphological reflex. It is not clear what evidence (if any) could be raised against this alternative.

Other sorts of symmetric predicates, including nouns and adjectives, also exhibit alternations similar to those of symmetric verbs. Gleitman et al. (1996) point out that this is the case in English: Sentence (116a) is understood to mean "Bees and wasps are similar *to each other.*"[39] The proper analysis of symmetric predicates that do not carry reciprocal morphology is a big topic that I will not attempt to resolve here.

(116) a. Bees and wasps are similar.
     b. Bees are similar to wasps.

In any event, the second argument of irreducibly symmetric verbs is frequently expressed with a comitative, whether or not there is evidence of a reciprocalization operation. Therefore we would prefer an explanation for the demotion of the second argument to comitative that is more general than the incidental suppression of accusative assignment. One possibility is that Case serves to identify arguments according to their relative positions in the thematic hierarchy; since the two arguments of an irreducibly symmetric reciprocal are thematically equivalent, the internal one cannot be identified by the verb. This suggests that we should expect similar syntax with symmetric predicates in general (but the transitive use of *meet* in English is an apparent counterexample).

The case assigner employed in discontinuous reciprocals is usually the all-purpose comitative marker, which in many languages serves as a catch-all preposition (Stassen 2000). In English, reciprocal verbs normally use *with* for their second argument, as do symmetric nouns, but symmetric adjectives use the preposition *to.* This seems to be simply a peculiarity of adjectival syntax, especially since many non-symmetric relational adjectives (and nouns) also license their arguments with *to,* as example (118) shows.[40] With verbal reciprocals the comitative can in some instances be replaced by a preposition indicating source, as in (119b,c).

(117) a. The car collided with the tree.
     b. Harriet is friends with Bill.
     c. John is married/related/similar to Mary.

(118) John is friendly/generous/prior to Mary.
(119) a. John separated the pigs and the cows.
     b. John separated the pigs from the cows.
     c. The pigs were separated from the cows.

5.3 Symmetric reciprocals and situation type

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.

On the other hand, irreducible symmetry is a property of individual events, and we can only determine whether a situation is truthfully described by an irreducibly symmetric reciprocal if we examine

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[39]Hackl (2002) derives the reciprocally interpreted form of symmetric nouns from a corresponding two-place base, via a form of covert reciprocalization.

[40]See Lakoff and Peters (1969) for an early discussion of preposition selection in such examples from English. In many other languages we have considered, adjectives use the same comitative complementizer as verbs do; at any rate the semantics of English symmetric adjectives appear to be no different from those of their equivalents in other languages.

each event in turn. Put differently, irreducible symmetry is a relationship that must hold between the participants of each individual event, not collectively between all participants to events in a situation.

It follows that irreducible symmetry is compatible with any cumulative situation type that is not explicitly asymmetric; it is just as compatible with Weak Reciprocity as it is with Strong Reciprocity. For example, diagram (120a) shows a weakly reciprocal relation consisting of three symmetric events. Weak reciprocity could also have been satisfied, preserving the same pairing, by six non-symmetric events as shown in (b). (Consider, for three fixed couples, three symmetric kisses vs. three pairs of non-symmetric kisses).

(120) 　　a.　$\begin{array}{l} a_1 \leftrightarrow b_1 \\ a_2 \leftrightarrow b_2 \\ a_3 \leftrightarrow b_3 \end{array}$　　b.　$\begin{array}{l} a_1 \rightleftarrows b_1 \\ a_2 \rightleftarrows b_2 \\ a_3 \rightleftarrows b_3 \end{array}$

Chaining situations are typically illustrated with asymmetric predicates such as *follow*. Such predicates are obviously incompatible with the irreducible symmetry property. But as example (b) shows, irreducibly symmetric predicates can also be interpreted chain-wise: the graph of the relationship is a long line with each participant being related only to its immediate neighbours, symmetrically in example (b) but asymmetrically in (a).

(121) a. The children followed each other into the room.
　　　b. The lights on the highway are 100 meters from each other.

Irreducible symmetry, then, is in principle independent of cumulative situation type. The symmetricization operator defined in (98) specifies a condition on the participants of each single event in the extension of the predicate, not on the set of events in aggregate. By itself, it does not require Strong Reciprocity; it is just as compatible with other traditional reciprocal situation types, such as Weak Reciprocity. In the previous section, it was our definition of the symmetric reciprocalization operator (99) that imposed Strong Reciprocity, in accordance with the treatment of Heim et al. (1991a). Instead, we could use the formula in (122), which is based on the analysis of Sternefeld (1998). The resulting system assigns the semantics of Weak Reciprocity to our reciprocal sentences.

(122) **Symmetric reciprocalization operator** (WR version)
　　　$\text{SRecip(V)} = \lambda R \, \lambda S \, {<}S, R{>} \in {}^{**}\{{<}x, y{>} : \text{Symm}(V)(x, y) \land x \neq y\}$

To understand this formula, a short explanation of Sternefeld's system is in order. It is based on the *cumulation* operator **, a two-place counterpart of the traditional plural operator *.

(123) For any two-place relation R, let $^{**}R$ be the smallest relation such that
　　　a. $R \subseteq {}^{**}R$, and
　　　b. if ${<}a, b{>} \in {}^{**}R$ and ${<}c, d{>} \in {}^{**}R$, then ${<}a \oplus c, b \oplus d{>} \in {}^{**}R$.

Sternefeld shows that by using this operator, we can rewrite the truth conditions for Weak Reciprocity, shown below in (124a), into the form in (b).

(124) Weak Reciprocity
　　　a. $(\forall x \in A)(\exists y, z \in A)(x \neq y \land x \neq z \land xRy \land zRx)$
　　　b. ${<}A, A{>} \in {}^{**}\{{<}x, y{>} : {<}x, y{>} \in R \land x \neq y\}$

Unpacked, (124b) says that A must be the sum of parts x, not necessarily atomic, such that for each such x there is some part $y \neq x$ for which xRy holds; and also A must be the sum of parts y with the corresponding property. This is Weak Reciprocity (with the added benefit of accounting for collective action, since it does not require quantification over atomic individuals).

To adapt Sternefeld's system to irreducibly symmetric reciprocals in (122), we replaced the relation R with *Symm(V)*, the result of applying the symmetricization operator to the verb V, and kept the two argument positions separate in order to accommodate discontinuous reciprocals. If reflexivization is subsequently applied (as it must for simple reciprocals) we recover Sternefeld's Weak Reciprocity formula for the relation *Symm(V)*:

(125) a. $\text{Refl}(\text{SRcp}(V)) = \lambda A <A, A> \in **\{<x, y> : \text{Symm}(V)(x, y) \land x \neq y\}$

These formulas allow us to assign to symmetric reciprocals the semantics of Weak Reciprocity, and also to account for situations in which there is joint action (so that quantification "down to individuals" would give the wrong result). It can be seen that the semantic contribution of symmetricization was coupled to Sternefeld's system with minimal changes, demonstrating that the event type and the cumulative situation type are largely independent of each other.

6 Conclusion

Discontinuous reciprocals, as we have seen, are a specialized construction that is distinct from the simple reciprocal, and cannot be derived from it through some combination of conjunction, comitation or extraposition operations. Unlike simple reciprocals, they do not identify their two argument positions with a single NP; the two arguments remain distinct at all stages of interpretation. This finding required some re-adjustments of our semantics for reciprocals: The argument identification step must be distinguished from the core reciprocal semantics.

We have likewise seen that we must distinguish between the semantics of ordinary reciprocals and those with irreducibly symmetric meanings. All reciprocals describe "cumulative" situations that are in some manner reciprocated between participants; even asymmetric situations are presented in a way that abstracts away from the different roles of the participants. But various phenomena make distinctions based on whether the individual events are symmetric, i.e., on whether the predicate is "irreducibly symmetric". The linguistic salience of this notion is demonstrated by its close association not only with the discontinuous reciprocal, but with a number of other reciprocal phenomena as well. In some languages, such as Greek, reciprocal verbs must be irreducibly symmetric in meaning (although the base verb itself need not be irreducibly symmetric, only the result). Other languages, including German, can also form reciprocal verbs that are *not* irreducibly symmetric; but in general, in both types of languages, the discontinuous reciprocal construction can only be used with irreducibly symmetric verbs. The fact that a number of Bantu languages form a conspicuous exception complicates the situation, but the general pattern still demonstrates the sensitivity of syntax to the parameter of irreducible symmetry. Moreover, we have seen that the discontinuous construction appears to be sensitive not to the presence of symmetric reciprocalization per se, but of irreducible symmetry (at least if we put those Bantu exceptions aside).

Section 5 outlined an analysis of irreducibly symmetric reciprocals that derives the simple and discontinuous variants from the same basic structure, deriving the former from the latter. The core reciprocalization operation yields the argument structure underlying discontinuous reciprocals, while simple reciprocals require a second, optional "reflexivization" operation. But as an anonymous reviewer points out, this leads to the prediction that simple reciprocals might carry specifically reflexive morphological marking in addition to whatever marker of reciprocalization is present on discontinuous reciprocals. This prediction is not borne out: Simple and discontinuous reciprocals involve phonologically identical marking on the verb (except for the possibility of singular agreement where applicable), in every language that I am aware of. The posited argument identification operation appears to be always (?) phonologically null.

Since I have not put forth any sort of detailed model of derivational morphology (beyond allowing for the possibility of lexical as well as syntactic derivation), it is impossible to evaluate the strength of any prediction about the morphological exponence of reciprocalization. But while the discovery of additional reflexive marking would have neatly lent support to the proposed analysis, its absence is not incompatible with our assumptions. The meanings of verbal argument structure operators are frequently quite variable; German uses *sich* for (at least) reflexives, reciprocals and middles, Italian uses *si* for reflexives, reciprocals, middles and impersonals, etc. Reinhart (2002) adopts the view that grammar underdetermines the semantics of such operators: their core meaning is some elementary operation, for example the elimination of accusative Case assignment, and the various meaning shifts are introduced

as a means of returning the verb to a state where all required arguments can be licensed.

The Case identification account discussed in section 5.2 is consistent with this view: Suppose that the operation of symmetricization, by creating two thematically indistinguishable arguments, interferes with the assignment of separate Case frames to them. The situation can be rectified by means of some "adjustment" operation that will once again ensure that the number of projected arguments matches the number of positions that can be licensed: either by introducing a comitative as a case assigner (resulting in a discontinuous reciprocal) or by reducing the two arguments to one by means of a reflexivization operation. Reflexivization of this sort is introduced, more or less automatically, as a consequence of the morphosyntactic operation of symmetric reciprocalization; it is not itself a morphosyntactic operation but rather a primitive argument structure operation on a grammatical object, part of one possible realization of reciprocalization (the other being the discontinuous structure). Therefore the reflexivization step is not associated with overt morphology beyond the reciprocalization operator itself. We might say that the reflexivizing function is an optional part of the verbal reciprocalization strategy, not an additional morphosyntactic operation.[41]

The preceding discussion has also raised, but not directly addressed, the question of whether (and perhaps when) reciprocalization occurs in the lexicon, in the syntax, or in both domains. While Reinhart and Siloni's model of one language-wide parameter setting seems too restrictive for some of the situations we have encountered, we have seen that there is a consistent correlation between symmetric reciprocalization and lexically listed reciprocal verbs (that is, those that are non-compositional in meaning). The correlation is partly due to the fact that irreducible symmetry is often introduced, precisely, through a lexicalized meaning shift; but it is nevertheless suggestive of a strong connection between symmetry and derivation "in the lexicon" (assuming that non-compositional meanings are not introduced in connection with syntactic-component operations). Unfortunately this is a very large issue that could not be adequately addressed here.

Our analysis has left a number of other questions open. We have only superficially addressed the question of how to formalize the notion of irreducibly symmetric event itself. Associating multiple participants with the same thematic role (let alone two) leads to well-known technical problems, some of which were mentioned in section 5. Next to this is the question of just how symmetry is related to the discontinuous construction: Why is irreducible symmetry required to license the construction, and just how does the licensing work? While I have suggested that the reasons have to do with the thematic indistinguishability of the two argument positions, much more should be said before the matter can be considered settled.

Finally, of course, there is the question of the Bantu languages that do not follow the correlation of discontinuous reciprocals with irreducible symmetry. This too is a large subject that must be left for future work. But while no explanation for their surprising behaviour suggests itself, these Bantu reciprocals are not completely incommensurate to, say, French or English reciprocals. For example, as shown by the work of Mchombo (1993), Mchombo and Ngunga (1994), Dalrymple et al. (1994, 1998b), reciprocals in these languages show the same kind of scope-like ambiguities ("long-distance reciprocal" readings) that are found with pronominal reciprocals in English.

(126) John ndí Bill a-ku-gáníz-a   kutí a-na-gónj-étsǎn-a.
       John and Bill SM-Pres-think-FV that SM-Past-lose-Caus-Rcp-FV
       'John and Bill think that they defeated each other'   (Chicheŵa; Dalrymple et al. 1994)

Rather than being completely different, the Bantu reciprocals seem exceptional in being endlessly mutable. This suggests that they are not so much a different type as a different manifestation of the same

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[41]The Case identification hypothesis is called into question by the fact that some non-reciprocal, transitive verbs express irreducibly symmetric concepts; the English verb *meet* seems to be a case in point. But to maintain the claim that reflexivization of symmetric reciprocals is an "adjustment" operation, we need not assume that Case identification is the reason behind the use of the comitative. We could do just as well with some other account of why the second argument is expressed as a comitative. (And some sort of account is required in any case).

building blocks that create the ordinary reciprocals.

Our classification of reciprocals relies on major types such as "verbal" and "argumental"; but instead of falling into types and subtypes with less and less in common with typologically distant types, reciprocal types seem to involve multiple independent factors that can be combined in numerous different ways. Eventually, one can hope that it should be possible to express the different reciprocal types as combinations of recurring, elementary semantic and syntactic units, along the lines proposed (for argument structure operations in general) by Reinhart (2002). The reciprocals we encounter would be composed of operations like "argument identification", "intransitivization", "symmetric predicate formation", etc. But the attainment of such a system must, also, be left for future work.

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