Reciprocal = Floating quantifier + anaphor: Evidence from Greek discontinuous reciprocals

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1. Introduction

Despite the fact that reciprocals in languages like English look like a single element on the surface, they have been analyzed as bipartite from a semantic perspective. At least since Heim et al. (1991), reciprocity is often reduced to the combination of a quantificational distributor (e.g., *each*) with a reciprocating anaphoric element. In addition, the distributor is often assumed to undergo (covert) movement in order to distribute over its antecedent.

In this paper, we focus on the syntax of the largely understudied discontinous reciprocal construction in Modern Greek, which wears bipartiteness on its sleeve: it consists of two syntactically independent nominals, the distributor *o enas* 'the one' and the reciprocator *o alos* 'the other'. (We set aside the language's verbal reciprocals, which have sharply different properties; see Paparounas forthcoming for discussion and references)

(1) I monaxi stirizun o enas ton alo.
the.NOM.PL monk.NOM.PL support.3PL the.M.NOM one.M.NOM the.M.ACC other.M.ACC
'The monks$_i$ support each other$_i$.'

Alongside showing that the two elements are truly syntactically independent, we provide a detailed analysis of the locality properties of the construction. We show that the two reciprocal parts can be separated from the antecedent by islands, which leads us to conclude that they cannot be related by means of movement/Agree. Furthermore, we argue that our data speak in favor of a more traditional definition of the binding domain that is characterized by the presence of a subject (in an abstract sense, viz., a DP in Spec,vP/TP/PredP). Finally, we argue that the different locality restrictions governing the distribution of distributor and reciprocator fall out straightforwardly if the former is analyzed as a floating quantifier and the latter as a plain anaphor.

2. Basic data

In this section, we illustrate the basic properties of the Greek discontinuous reciprocal construction. Firstly, consider agreement and case: as shown in (1) the distributor agrees with the plural antecedent in case (here nominative), while the reciprocator behaves as the 'real' argument, bearing the expected case of the structural position where the reciprocal is interpreted (in this case, the accusative typical of direct objects).

While the antecedent is obligatorily plural, the reciprocal parts are singular. They are always third person, while the antecedent can also be first or second person. In addition, both reciprocal parts agree with the antecedent in gender. Finally, while the antecedent can be indefinite, the reciprocal parts are obligatorily definite.

Configurationally, there is a c-command requirement between the two reciprocal parts (2) and between them and the antecedent (3):

(2) *I monaxi stirizun o alos ton
the.NOM.PL monk.NOM.PL support.3PL the.M.NOM other.M.NOM the.M.ACC
ena.
one.M.ACC
'*The monks support the other each.'

(3) a. *O enas ton alo stirizi tus
the.M.NOM one.M.NOM the.M.ACC other.M.ACC support.3SG the.ACC.PL
monaxus.
monks.ACC.PL
'*Each other supports the monks.'

b. [I skili [ton monaxon]$_i$]$_j$ stirizun
the.NOM.PL dog.NOM.PL the.GEN.PL monk.GEN.PL support.3PL
[o enas ton alo]$_{j/*i}$.
the.M.NOM one.M.NOM the.M.ACC other.M.ACC
'[[The monks']$_i$ dogs]$_j$ support [each other]$_{j/*i}$.'

Both the antecedent and the reciprocator can bear different grammatical functions. Thus, the antecedent can also be a direct object, as in (4) where, as a consequence, the distributor also bears accusative:

(4) Sistisa tus fitites ton ena ston
introduced.1SG the.ACC.PL student.ACC.PL the.M.ACC one.M.ACC to.the.M.ACC
alo.
other.M.ACC
'I introduced the students$_i$ to each other$_i$.'

In addition, the antecedent can be a genitive within DP, the object of a preposition and, to a limited extent, also an indirect object (not illustrated).

The reciprocator can be a direct object as in (1); situated within a PP as in (4); an IO (bearing genitive case) and a genitive within DP (either a thematic argument of the noun, e.g. theme, or a possessor) as in (17a) below. Finally, the reciprocator can also be nominative if it occurs as the subject of an embedded clause, as in (6a) below.

In terms of constituency, there is strong evidence that the two elements do not form a constituent. They can be split by parts of a DP (see (17a) below) and by complementizers (see (6a) below). Splitting by complementizer and certain prepositions as in (4) is in fact obligatory. In addition, the two parts never behave like a constituent; for instance, they cannot be fronted together (5):

(5) *[O enas ton alo] stirizun i
the.M.NOM one.M.NOM the.M.ACC other.M.ACC support.3PL the.NOM.PL
monaxi.
monk.NOM.PL
Intended: 'It is each other$_i$ that the monks$_i$ support.'

3. Locality constraints

In this section, we explore the locality constraints in the reciprocal construction. First, we argue that the reciprocator is an anaphoric element subject to the binding theory because the construction is sensitive to the presence of intervening subjects. Second, we argue that the relationship between antecedent and the reciprocal parts is not established via movement or Agree because the two can be separated by islands.

3.1 The reciprocator as an anaphoric element

Evidence that the reciprocator is subject to the binding theory comes from (6); data of this type show that the distribution of the reciprocator is affected by intervening subjects.

(6) a. I monaxi pistevun o enas [oti
the.NOM.PL monk.NOM.PL believe.3PL the.M.NOM one.M.NOM COMP
o **alos** sevete ton iɣumeno].
the.M.NOM other.M.NOM respect.3SG the.ACC abbot.ACC
'[The monks]$_i$ think that [each other]$_i$ respects the abbot.'

b. *I monaxi pistevun o enas [oti
the.NOM.PL monk.NOM.PL believe.3PL the.M.NOM one.M.NOM COMP
o iɣumenos sevete **ton** **alo**].
the.NOM abbot.NOM respect.3SG the.M.ACC other.M.ACC
'[The monks]$_i$ think that the abbot respects [each other]$_i$.'

While the relationship between antecedent and reciprocator can cross a finite clause boundary (with the reciprocator as an embedded subject), it cannot cross an embedded subject (with the reciprocator an embedded object).

The relevance of subjects (in an abstract sense) can also be seen in small clauses. Generally, the reciprocator can be a small clause subject when the antecedent is the matrix subject. As shown in (7a), the reciprocator can be bound within the small clause if the antecedent is the small clause subject; crucially, however, (7b) shows that it cannot be bound across the small clause subject with the antecedent being the matrix subject:

(7) a. I monaxi θeorun tis kaloɣries
the.NOM.PL monk.NOM.PL consider.3PL the.ACC.PL nun.ACC.PL
θimomenes ti mia me tin ali.
anger.PTCP.F.ACC.PL the.F.ACC one.F.ACC with the.F.ACC other.F.ACC
'The monks$_i$ consider the nuns$_j$ angry at [each other]$_j$.'

b. *I monaxi θeorun o enas tis
the.NOM.PL monk.NOM.PL consider.3PL the.M.NOM one.M.NOM the.ACC.PL
kaloɣries θimomenes me ton alo.
nun.ACC.PL anger.PTCP.F.ACC.PL with the.M.ACC other.M.ACC
'The monks$_i$ consider the nuns$_j$ angry at [each other]$_i$.'

This pattern of intervention by subjects can be replicated with ECM constructions.

Note that the locality restrictions we have documented cannot be reduced to standard A-intervention because a subject antecedent can be related to a reciprocator within a PP across a direct object as in (8):

(8) I fitites sistisan ti Maria o
the.NOM.PL student.NOM.PL introduce.PST.3SG the.ACC Mary.ACC the.M.NOM
enas ston alo.
one.M.NOM to.the.M.ACC other.M.ACC
'The students$_i$ introduced Mary to each other$_i$.'

Rather, the pattern is reminiscent of the constraints of binding theory, where configurational subjects (viz., the highest specifier of a given projection) have a privileged role in that they restrict the portion of the clause within which binding is to be established. Our data suggest that the antecedent binds the reciprocator, which is thus subject to Condition A of the binding theory. How the distributor fits in will be addressed in section 4 below.

3.2 The link between antecedent and the reciprocal parts

We now discuss how the antecedent is linked to the reciprocal parts, beginning with the reciprocator. In much of the recent literature it is assumed that antecedent and anaphor are linked via syntactic mechanisms such as movement or Agree to account for the sharing of phi-features and the local nature of the dependency; see, e.g., Hornstein (2001), Reuland (2011), Rooryck and Wyngaerd (2011) and the references cited there for various possible implementations.

As for the relationship between distributor and antecedent, this is sometimes taken to involve covert movement of the former to the latter (Belletti 1982, Heim et al. 1991). An alternative in terms of overt movement would generate the two as a unit and strand the distributor through movement of the antecedent. In their analysis of Icelandic reciprocals, Sigurðsson et al. (2022) argue that both overt and covert movement co-occur.

In what follows, we argue that none of these movement/Agree-based approaches are promising for the Greek reciprocal construction because the relationship between the antecedent and the reciprocal parts fails to comply with well-established constraints on movement and agreement within the language. The restrictions on distributor and reciprocator in fact differ somewhat, an asymmetry we address in section 4 below.

3.2.1 Islands

The following data show that the reciprocator, and, to some extent, the distributor, can occur in domains that are opaque to movement. In (9), both parts occur embedded in the first conjunct of a coordination:

(9) I maθites mazepsan [ton kaθijiti o
the.NOM.PL student.NOM.PL gather.PST.3PL the.ACC professor.ACC the.M.NOM
enas tu alu] ke [ton ðiefθindi] stin
one.M.NOM the.M.GEN other.M.GEN and the.ACC principal.ACC in.the.ACC
taksi.
classroom.ACC
'The students$_i$ gathered each other$_i$'s professor and the principal in the classroom.'

Under a movement analysis, this would involve asymmetric movement from a conjunct, in violation of the Coordinate Structure Constraint (CSC).

In (10), both parts occur within an adjunct PP (the distributor, unlike the reciprocator, is somewhat selective as to which PPs in can occur in):

(10) I monaxi zun kala (o enas) xari
the.NOM.PL monk.NOM.PL live.3PL well the.M.NOM one.M.NOM grace
stin kalosini (o enas) tu alu.
to.the.ACC kindness.ACC the.M.NOM one.M.NOM the.M.GEN other.M.GEN
'The monks$_i$ live well thanks to each other$_i$'s kindness.'

Since PPs are islands for extraction quite generally in the language, a movement approach is not promising.

Furthermore, the reciprocator (but not the distributor) can occur within relative clauses. As the contrast in (11) shows, we find the same subject-object asymmetry as with complement clauses (recall (6)):

(11) a. I monaçi θa fane o enas [to
the.NOM.PL monk.NOM.PL FUT eat.3PL the.M.NOM one.M.NOM the.ACC
fajito pu eçi ftiaksi o alos].
food.ACC that have.3SG make.PFV.3SG the.M.NOM other.M.NOM
'The monks$_i$ will eat the food that each other$_i$ has made

b. *I monaçi çeretisan o enas [tin
the.NOM.PL monk.NOM.PL greet.PST.3PL the.M.NOM one.M.NOM the.ACC
kaloɣria pu aɣapai ton alo].
nun.ACC that love.3SG the.M.ACC other.M.ACC
'The monks$_i$ greeted the nun that loves each other$_i$.'

These data show that while binding of the reciprocator is not subject to strong islands, it is affected by the presence of a subject, thus implying that binding is clearly restricted to a certain locality domain. Importantly, the insensitivity to islandhood cannot be related to logophoricity: the reciprocator has the properties of a plain anaphor, being compatible with inanimate antecedents. This is the case even when it occurs inside an island, e.g., an adjunct PP as in (12):[1]

(12) I planites ine skotini simera o enas
the.NOM.PL planet.NOM.PL be.3PL dark.NOM.PL today the.M.NOM one.M.NOM
eksetias tu ðoriforu tu alu.
because the.GEN satellite.GEN the.M.GEN other.M.GEN
'The planets$_i$ are dark today because of each other$_i$'s satellites.'

In summary, a movement approach linking antecedent and the reciprocal parts is unlikely to be successful given that the two can be separated by (strong) island boundaries. This conclusion holds irrespective of the precise implementation, viz., A-movement of antecedent plus spell-out, A-movement of antecedent plus stranding, head-movement or A-movement of anaphor, covert movement/QR of distributor (note that while QR may be able to escape PPs, it is definitely sensitive to the CSC).

The data discussed in this section also generally argue against an account in terms of Agree, on the assumption that Agree is subject to the same island constraints as movement. In addition, it can normally not target constituents embedded within PP and DP. Furthermore, cross-clausal agreement in Greek, while in principle possible, is restricted to subjunctive clauses. Finally, the mismatch in number (and possibly person and definiteness) between antecedent and reciprocal parts also renders an Agree approach non-trivial. For more arguments against establishing binding by means of Agree in general, see e.g. Charnavel and Sportiche (2016:65–71) and Bruening (2021:431ff.) (and cf., e.g., Paparounas and Akkuş to appear for a possible reconciliation).

That the reciprocator is bound by the antecedent correctly predicts that the two will agree in gender (gender matching being a hallmark of anaphoric dependencies more broadly).

[1] More arguments against logophoric binding come from the impossibility of binding without c-command (3b) and the absence of long-distance binding (6b); split antecedents are not possible either.

3.2.2 More evidence against stranding

Much of the data of the previous subsection argues against a movement dependency between antecedent and distributor (covert movement of the distributor or stranding by movement of the antecedent). The following example explicitly argues against a stranding analysis. In (13), the distributor is related to the subject but it occurs below the base position of the subject, viz., within a PP-complement:

(13) Milisan i fitites ston kaθijiti **o**
talk.PST.3PL the.NOM.PL student.NOM.PL to.the.ACC professor.ACC the.M.NOM
enas tu alu.
one.M.NOM the.M.GEN other.M.GEN
'The students$_i$ talked to each other$_i$'s professor.'

3.3 The binding domain

The previous subsections have provided evidence that the relationship between antecedent and the reciprocal parts cannot be reduced to movement/Agree. There remains the possibility, though, that the binding domain can be derived from independent syntactic principles. For instance, Charnavel and Sportiche (2016) propose that the binding domain should be related to phasehood such that an anaphor must be bound within a spell-out domain; simplifying somewhat for our purposes, this domain corresponds to the finite TP. The Greek data where the reciprocator occurs as the subject of a complement/relative clause (6a, 11a) show that this approach will not extend to the Greek reciprocal construction. Given that there is a finite CP boundary between antecedent and reciprocator, the two are not within the same spell-out domain. Rather, our data speak in favor of more traditional definitions of the binding domain, closer to Chomsky (1981):

(14) **Binding Domain**
The smallest XP containing the anaphor and a distinct and accessible subject (where subject is a DP in Spec,vP/TP/PredP).

The restriction to accessible and distinct subjects covers two separate cases. Requiring the subject to be distinct from the anaphor itself ensures that the binding domain of anaphors in the embedded subject position (including small clauses and ECM) is extended to the matrix clause. Requiring an accessible subject ensures that anaphors contained within an embedded subject (see (16a) below) cannot be bound by the containing DP but rather need an antecedent in the matrix TP. Binding of anaphors that are within the same clause as their antecedent (TP, small clause) can be bound straightforwardly.[2]

[2]There remain questions about the cross-linguistic variability of the binding domain in that in many languages anaphors cannot occur in embedded subject position (e.g., Charnavel and Sportiche 2016). Additionally, some languages, including Modern Greek and possibly English (see, e.g., Lebeaux 1983), only allow reciprocals in embedded subject position but not reflexives. While the anaphor agreement effect may play a

4. The distributor as a floating quantifier

In this last section, we address the locality restrictions of the distributor and argue that they follow once it is analyzed as a floating quantifier that can be adjoined in different positions.

4.1 Parallel distribution

We start by showing that the distributor of the reciprocal construction shares crucial morphosyntactic and distributional properties with the morphologically related quantifier *kaθenas* 'each' (lit. 'each-one'). First, we note that *kaθenas*, which usually occurs with the definite article, also requires a c-commanding associate with which it agrees in case and gender (but not number, *kaθenas* being necessarily singular). (15a) illustrates agreement in case/gender, while (15b) shows that the quantifier can distribute over a c-commanding nominal but not a DP embedded within that nominal:

(15) a. I monaxi ipçan { o kaθenas /
the.NOM.PL monk.NOM.PL drink.PST.3PL the.M.NOM each.M.NOM
*ton kaθena / *tu kaθenos / *i
the.M.ACC each.M.ACC the.M.GEN each.M.GEN the.F.NOM
kaθemia } ðio potirja krasi.
each.F.NOM two glass.ACC.PL wine
'The monks each drank two glasses of wine.'

b. I fili ton monaxon ipçan {
the.NOM.PL friend.NOM.PL the.GEN.PL monk.GEN.PL drink.PST.3PL
o kaθenas / *tu kaθenos } ðio potirja
the.M.NOM each.M.NOM the.M.GEN each.M.GEN two glass.ACC.PL
krasi.
wine
'The monk's friends each drank two glasses of wine.'

Turning to distributional parallels, both *o enas* and *kaθenas* must occur in the same finite clause as their plural antecedent:

(16) a. I monaxi ipan (o enas) [oti
the.NOM.PL monk.NOM.PL say.PST.3PL the.M.NOM one.M.NOM COMP
(*o enas) ta rasa tu alu
the.NOM one.M.NOM the.NOM.PL stole.NOM.PL the.M.GEN other.M.GEN
ine omorfa].
be.3PL beautiful.NOM.PL
'The monks$_i$ said that each other$_i$'s stoles are beautiful.'

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certain role, it will not immediately account for the asymmetry within Modern Greek, where both types of anaphor can trigger agreement, nor within English, where neither anaphor is compatible with agreement.

b. I monaxi ipan (o kaθenas) [oti
the.NOM.PL monk.NOM.PL say.PST.3PL the.M.NOM each.M.NOM COMP
(*o kaθenas) ðio kaloɣries eftasan sto
the.M.NOM each.M.NOM two nun.NOM.PL arrive.3PL in.the.ACC
monastiri].
monastery.ACC
'The monks$_i$ each$_i$ said that two nuns arrived at the monastery.'

Second, both can occur right before or within possessed DPs:

(17) a. I monaxi θavmazun (o enas)
the.NOM.PL monk.NOM.PL admire.3PL the.M.NOM one.M.NOM
ta rasa (o enas) tu alu.
the.ACC.PL stole.ACC.PL the.M.NOM one.M.NOM the.M.GEN other.M.GEN
'The monks$_i$ admire each other$_i$'s stoles.'

b. I monaxi frondizun (o kaθenas) tin
the.NOM.PL monk.NOM.PL take.care.3PL the.M.NOM each.M.NOM the.ACC
avli (o kaθenas) mias eklisias.
yard.ACC the.M.NOM each.M.NOM one.GEN church.GEN
'The monks each take care of the courtyard of one church.'

Furthermore, both can occur immediately preceding or within (certain) PPs and neither can occur next to their antecedent (not illustrated).

Given these significant parallels, the distribution of the distributor receives a straightforward account by treating it as a floating universal/distributive quantifier.

4.2 Relationship between quantifier and antecedent

Since a movement relationship between antecedent and distributor is widely counter-exemplified by our data, we must commit to an adverbial analysis of the distributor/floating quantifier, according to which this element is adjoined to some projection of NP/VP (see, e.g., Fitzpatrick 2006). To account for the agreement facts, adverbial analyses usually posit a null proform within the constituent headed by the quantifier that is coindexed with the antecedent, e.g., [$_{DP}$ each *pro*]. While this can account for the gender agreement, it cannot for the case agreement. This is in fact a more general problem in that there are certain constructions where a dependent element agrees with an antecedent without there being a direct syntactic link between the two. Concretely, the same problem arises in Greek with certain depictives and binomial *each* (cf. English *The students published two papers each*): in both cases, the depictive or quantifier can occur below the base position of its associate. Thus, whatever ensures case-agreement in these configurations can be assumed to be at work in the Greek discontinuous reciprocal construction.

5. Conclusion

In our analysis of the discontinuous reciprocal construction in Modern Greek we have argued that the distribution of the reciprocator, in particular its sensitivity to the presence of a subject (viz., a DP in Spec,vP/TP/PredP), suggests it is a plain anaphor subject to Condition A of the binding theory. The distributor, on the other hand, was analyzed as a floating quantifier, based on parallels with the floating quantifier *kaθenas*. We have argued that the relationship between antecedent and the reciprocal parts cannot be established by means of movement or Agree given that the two can be separated by (strong) islands. Finally, we have argued that the size of the binding domain, especially the possibility for the reciprocator to occur in embedded subject position, speaks against reducing the binding domain to phasehood and instead supports more traditional definitions of the binding domain.

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