E-raising reconsidered: Constituency, coordination and case-matching reciprocals*

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Abstract

In Icelandic, part of the complex reciprocal *hvor annar* matches in case with the reciprocal's antecedent. In structures where the reciprocal is embedded in a PP, the P intervenes between the two parts. A recent analysis of these data suggests that part of the reciprocal overtly moves to the base position of the antecedent by an operation termed *e-raising*. We show that such an analysis makes a number of wrong predictions about the constituencies of such structures and also about the behavior of reciprocals in coordinations. We show that this is also the case for other languages that show case-agreeing reciprocals. We instead argue that matching in case between antecedent and reciprocal can occur with the reciprocal staying in situ. Instances with PPs do involve movement but only to the edge of PP and not further. This analysis is in line with a number of recent approaches that advocate for a morphosyntactic feature matching relation between antecedent and locally bound anaphors.

Keywords: syntax, reciprocals, agreement, binding, case, constituency, prepositions

Sigurðsson et al. (2022) develop a theory of an underanalyzed set of constructions in Icelandic, all involving the distributive element *hvor*. The constructions they investigate are given in (1): the reciprocal *hvor annar* construction (1a), the distributive *hvor sinn* construction (1b), and the distributive *sinn hvor* construction (1c). They refer to the two parts (e.g., *hvor* and *annar* in (1a)) of these elements as *e-associates*.

(1) a. Þeir höfðu talað hvor um annan
they.NOM.M.PL had talked each.NOM.M.SG about other.ACC.M.SG
'They had talked about each other.'

b. Þeir höfðu komið hvor á sínu
they.NOM.M.PL had come each.NOM.M.SG on their.DAT.N.SG
hjólinu
bike.THE.DAT.N.SG
'They had (each) come on separate bikes.'

c. Þeir höfðu komið sinn á hvoru
they.NOM.M.PL had come their.NOM.M.SG on each.DAT.M.SG
hjólinu
bike.THE.DAT.N.SG
'They had (each) come on separate bikes.' (Sigurðsson et al. 2022: ex. 1-3)

Sigurðsson et al. point out the data in (1) raise two puzzles about the syntax of these structures: the *case puzzle* and the *position puzzle*. The case puzzle concerns how the higher of the two e-associates matches case with its antecedent. In (1), the antecedent is always nominative, and the higher e-associate must also be in the nominative case. Compare this to the example in (2). In this example, the antecedent is dative and the higher e-associate must also be dative.[1]

(2) Þeim hefur alltaf líkað hvorum við annan
them.DAT.PL has always liked each.DAT.M.SG with other.ACC.M.SG

'They have always liked each other.' (Sigurðsson et al. 2022: ex. 17a)

The position puzzle concerns the constituency of the constructions: namely where in the structure the higher e-associate is located. As seen in both (1) and (2), the two e-associates are separated via a preposition, suggesting that the two elements do not form a constituent (at least on the surface).

Sigurðsson et al.'s solution to both these puzzles concerns a movement operation they call e-raising. In all of these constructions, the two e-associates begin the derivation as a constituent, but the higher e-associate raises to the base position of the antecedent in the specifier of vP, where the two agree in case features. The antecedent subsequently moves to the specifier of TP, and the main verb undergoes head movement first to v and then to voice in order to derive the correct word order.[2] This is shown schematically in the representation in (3). The e-raising operation is thought to be the overt counterpart of Heim et al. (1991)'s covert movement approach to English reciprocals.

(3) $[_{TP}$ they$_i$ had $[_{VoiceP}$ talked$_j$ [$[_{vP}$ ~~they~~$_i$ each$_k$] ~~talked~~$_j$ $[_{PP}$ about $[_{DP}$ ~~each~~$_k$ $[_{nP}$ other]]]]]]

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While the analysis is quite clever and accounts for the reported data, in this reply, focusing specifically on the reciprocal construction, we show that it raises a number of additional unforeseen issues regarding the constituency of such structures and the ability of these elements to occur in coordinations. We show that classic constituency tests: topicalization, fragment answers, and coordination, indicate that the two e-associates form a closer knit constituent than is expected under this analysis even when separated by a preposition. We further argue that the coordination data is additionally problematic, as coordinations ban extraction out of single conjunct via the coordinate structure constraint (CSC; Ross 1967). We then discuss similar types of reciprocals in other languages: Greek, Bosnian-Croatian-Serbian and Telugu, and show that the reciprocals in these languages

behave nearly identically to the Icelandic reciprocal in terms of their case-matching and their constituency. We conclude by arguing that the case puzzle can be solved by the mechanism of Feature Transmission between an anaphor and its antecedent (Landau 2008; Kratzer 2009), and that the position puzzle should be solved not by movement out of PP, but movement to the edge of PP in a movement operations that is analogous to *ni*-movement found for negative concord items in Slavic.

If this proposal is on the right track, it has several consequences. First, Icelandic internally, it undermines an argument that the main verb undergoes "short" V-movement to Voice discussed in Sigurðsson et al. (2022). Second, it presents evidence for a morphosyntactic feature sharing relation holds between an anaphor and its antecedent with the anaphor staying *in situ* (Kratzer 2009; Hicks 2009; Heinat 2009; Bader 2011; Reuland 2011; Wurmbrand 2012, 2017; Antonenko 2011; Sundaresan 2018; Murphy and Meyase 2022; Paparounas and Akkuş to appear). The behavior of these case matching anaphors within PPs cross-linguistically also reveals additional information about the locality of the feature sharing relation. These constructions can be seen as the reciprocal counterparts of so-called case-copying reflexives, where complex reflexive anaphors agree in case with their antecedents (see Subbarao and Murthy 2000 and Messick and Raghotham to appear for Dravidian, Forker 2020 for Nakh-Daghestanian and Volkova 2014 and Volkova and Reuland 2014 for Uralic).

1 E-raising and Constituency

Under the e-raising analysis presented in the previous section, the two e-associates do not form a syntactic constituent on the surface, hence this analysis predicts that the two elements should not be able to picked out as a constituent via classic tests for constituency. Below we show that this prediction is incorrect. Using three tests for constituency: topicalization, fragment answers, and coordinations, we show that the two e-associates

form a constituent. This is even the case when there appears to be a preposition intervening between the two elements.

1.1 Topicalization

The first test we employ is topicalization. Icelandic allows for constituents to be topicalized to the front of the sentence, and this is possible for constructions involving the two e-associates. The examples in (4) show that this is possible whether the higher e-associate surfaces with nominative (4a-b) or dative case (4c). The examples in (4b-c) show that the sequence *e-associate Prep e-associate* also pass this constituency test, suggesting those three elements form a constituent.[3]

(4) a. hvor annan, hafa þeir séð
each.NOM.M.SG other.ACC.M.SG have they.NOM.M.PL seen
'Each other, they have seen.'

b. hvor um annan, höfðu þeir talað
each.NOM.M.SG about other.ACC.M.SG, had they.NOM.M.PL talked
'About each other, they had talked.'

c. hvorum við annan, hefur þeim alltaf líkað
each.DAT.M.SG with other.ACC.M.SG, has them.DAT.PL always liked
'Each other, they have always liked.'

d. Hvorn við öðrum hefur þá alltaf hryllt
each.ACC.M.SG with other.DAT.M.SG has them.ACC.M.PL always horrify
'Each other, they've always given the creeps.'

One may wonder if the examples in (4) are instances of headless v/VP movement of some sort, where the constituent that has moved to the front of the sentence is actually a vP remnant after the verb had undergone short head movement. This is schematized in (5).

(5) $[_{vP}$ hvor$_j$ t$_i$ $[_{PP}$ um t$_j$ annan $]$ $]_k$ höfðu þeir talað$_i$ t$_k$

While the existence of headless remnant movement is restricted cross-linguistically (Müller 1998; Takano 2000; Arano 2018), it does exist at least in some languages. For instance, the German example in (6) is analyzed as remnant VP-fronting after the main verb has moved out.

(6) [Kindern bonbons t_i]$_k$ gibt$_i$ man besser nicht t_k

children.DAT sweets.ACC gives one.NOM better not
'One shouldn't give candy to children.' (Arano 2018, ex. 12b)

If Icelandic allowed for headless *v*P fronting to explain (5), then we would also expect it to allow for headless *v*P fronting with ditransitive VPs, hence we would predict that the Icelandic equivalent of (6) should be grammatical. As shown in (7), this is not the case. Icelandic cannot front a headless *v*P for ditransitives. In fact, it appears that *v*P fronting in Icelandic is never allowed (see Wood 2018 and references).

(7) a. *Jón-i bók gaf Pétur

Jon-DAT book.ACC gave Peter.NOM
Intended: 'Peter gave John a book'

b. *Bók til Jón-s sendi Pétur

book.ACC to Jon-GEN sent Peter
Intended: 'Peter sent a book to John.'

The ungrammatically of (7) leads one to doubt the *v*P fronting analysis of (4) and in favor of treating the moved constituent as a DP or PP.

We also see that *annan* and P+*annan* cannot be topicalized on their own to the exclusion of *hvor*, as shown in (8). This follows naturally if these element form a surface constituent, but requires additional assumptions if the these elements were not constituents.

(8) a. *annan, hafa þeir séð hvor

other.ACC.M.SG have they.NOM.M.PL seen each.NOM.M.SG

Intended: 'Each other, they have seen.'

b. *um annan, höfðu þeir talað hvor

about other.ACC.M.SG, had they.NOM.M.PL talked each.NOM.M.SG
Intended: 'About each other, they had talked.'

c. *við annan, hefur þeim alltaf líkað hvorum

with other.ACC.M.SG, has them.DAT.PL always liked each.DAT.M.SG
Intended: 'Each other, they have always liked.'

d. *við öðrum hefur þá alltaf hryllt Hvorn

with other.DAT.M.SG has them.ACC.M.PL always horrify each.ACC.M.SG
Intended:'Each other, they've always given the creeps.'

1.2 Fragment Answers

The next constituency test that we utilize is the fragment answer test: only constituents can occur as a fragment answer to a constituent question. Once again, the two e-associates can occur as a fragment, regardless of case or whether or not there is a preposition intervening between them. In each example below, the response in (b) is a grammatical fragment to the question posed in (a).

(9) a. hvað/hverja sáu þeir

what/whoACC saw they.NOM.M.PL
'Who/what have they seen?'

b. hvor annan

each.NOM.M.SG other.ACC.M.SG
'Each other.'

(10) a. hvað/hverja töluðu þeir um

what/who.ACC talked they about
'Who/what had they talked about?'

b. hvor um annan

each.NOM.M.SG about other.ACC.M.SG

'About each other.'

(11) a. hverja hefur þeim alltaf líkað við

who.ACC has them.DAT.PL always liked with
'Who have they always liked?'

b. hvorum við annan

each.DAT.M.SG with other.ACC.M.SG
'Each other'

In addition to the non-contrastive fragments like those above, the two e-associates can occur as a contrastive fragment as well as shown in (12).

(12) a. Rökuðu rakararnir SJÁLFA SIG?

shaved barbers.the self SE
'Did the barbers shave THEMSELVES?'

b. Nei, HVOR ANNAN.

no each.NOM.M.SG other.ACC.M.SG
'No, EACH OTHER.'

Finally, the two associates can occur as a fragment coordinated with another DP, suggesting that the two form an DP constituent themselves, as shown in (13).

(13) a. Hvað borðuðu mýsnar?

what ate mice.THE
'What did the mice eat?'

b. Ostinn og hvor aðra.

cheese.THE and each.NOM.F.SG other.ACC.F.SG
'the cheese and each other.'

1.3 Coordinations

The final constituency test we consider is coordination. As hinted at by the fact that the reciprocal can occur in a coordination in fragment answers as in (13), the two e-associates can occur in a coordination together with another DP or in the case with PPs another PP. This is shown in (14).

(14) a. Kennararnir hjálpuðu hvor öðrum og nemendunum út
teachers.THE.NOM helped each.NOM other.DAT and students.THE.DAT out
úr rútunni
of bus.THE
'The teachers helped each other and the students out of the bus.'

b. Þeir höfðu talað hvor um annan og
they.NOM.M.PL had talked each.NOM.M.SG about other.ACC.M.SG and
um stjórnmál
about politics
'They had talked about each other and about politics.'

While there are preferences for the ordering of the conjuncts, neither order is ungrammatical, hence the reciprocal can be the second conjunct as in (15).

(15) Kennararnir hjálpuðu nemendunum og hvor öðrum út úr
teachers.THE.NOM helped students.THE.DAT and each.NOM other.DAT out of
rútunni
bus.THE
'The teachers helped the students and each other out of the bus.'

These coordination data provide a second argument against the e-raising analysis of these constructions. As the e-raising analysis relies on a movement operation, a prediction of the analysis would be it should be sensitive to constraints on movement. As

coordinations environments typcially block asymmetric extraction, under the e-raising account, it is surprising that these constructions can occur in coordinations without violating the CSC (Ross 1967; for recent discussion of the CSC see Bošković 2020; Oda 2021; Altshuler and Truswell 2022 and references). Under the e-raising analysis, in order for *hvor* to agree in case with the antecedent it would have to move to the specifier of vP. When the two e-associates are coordinated with another DP, then such a movement would violate the CSC, as we have asymmetric extraction out of a conjunct. This is shown schematically in (16) for the example in (14a).

(16) $[_{vP}$ hvor$_i$ $[_{VP}$ $[_{\&P}$ $[_{DP}$ t_i öðrum] og $[_{DP}$ nemendunum]]]]
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1.4 Summary

In this section, we provided three constituency tests that indicated that the two e-associates are a surface constituent in Icelandic. We further argued that the fact that these constructions can occur in coordinations is problematic for the e-raising account not only because it suggests that the two form a constituent but also because this would suggest that e-raising is possible out of a coordination in violation of the coordinate structure constraint.

These data suggest a reanalysis of the e-associate construction and the *case puzzle* and *position puzzle*. We argue below that in the structures with two e-associates, the higher associate gets its case value from Feature Transmission with the antecedent, but it remains a constituent with lower e-associate. In the cases where a preposition intervenes between the two e-associates, we suggest that the higher e-associate moves to adjoin to the edge of the PP where it can have its case feature valued. These solutions account for the case and position puzzles while allowing us to maintain the constituency of the two e-associates.

Before we present the details of the alternative analysis, we present additional data from other languages, Telugu, Greek and Bosnian-Croatian-Serbian (BCS) that similar

reciprocals show the same constituency and case facts.

2 Cross-linguistic Comparisons

In the next three subsections, we show that reciprocals in three other languages: Greek, BCS, Telugu have the same characteristics as the Icelandic reciprocal, suggesting that all of these languages should be analyzed similarly.

2.1 Greek

Greek is another language that has been reported to have case matching with part of the reciprocal (Everaert 2000).[4] This is shown for a nominative antecedent in (17a). The example in (17b) shows an accusative direct object antecedent. Here we see that the first part of the reciprocal must also be accusative and not nominative in this situation.

(17) a. i ginekes agapoun i mia tin
the.NOM.PL women.NOM.PL love.3SG.PL the.NOM.SG one.NOM.SG the.ACC.SG
alli
other.ACC.SG
'The women love each other.'

b. Tis sistisa ti mia stin alli
them.ACC introduced.1SG the.ACC one.ACC to.the other.ACC
'I introduced them to each other.'

Just as with Icelandic, Greek reciprocals are split by adpositions (18) (Mackridge 1987).

(18) Dhe milane o enas me ton allo
NEG talk-3PL.PRES.ACT the.NOM.M.SG one with the.ACC.M.SG other
'They don't talk to each other.'

Fragments once again suggest that the two parts of the reciprocal form a constituent even when split by a preposition as shown in (19) and (20).

(19) a. Se pjon sistises tis jinekes?

to who introduced.2SG the women.ACC
'Who did you introduced the women to?'

b. ti mia stin alli

the.ACC one.ACC to.the other.ACC
'To each other'

(20) a. Pjon agapun i jinekes?

who.ACC love the.NOM women.NOM
'Who do the women love?'

b. i mia tin alli

the.NOM.SG one.NOM.SG the.ACC.SG other.ACC.SG
'Each other.'

And the reciprocal can be coordinated with another DP or PP, as shown in (21).

(21) a. i mathites aresun o enas ston allo ke stus kathigites

the students.NOM please.3PL the one.NOM to.the other and to.the professors
'The students like each other and the professor.'

b. Sistisa tus mathites ton ena ston allo ke stus

introduce.1SG the students.ACC the one.ACC to.the other and to.the

kathigites

professors
'I introduced the students to each other and to the professors.'

2.2 Bosnian-Croatian-Serbian

Slavic languages also show this type of reciprocal as shown for Bosnian-Croatian-Serbian (BCS) in the examples in (22) (Despić 2011; LaTerza 2014).[5] In (22a), a nominative subject binds the reciprocal, and the first part of the reciprocal surfaces in the nominative case. If the antecedent is an accusative marked direct object, however, then the first part of the reciprocal displays accusative case (22b). As we have seen with the previous languages, the two parts of the reciprocal can be separated via preposition (22c).

(22) a. Studenti su udarali jedan drugog

Student.PL.NOM AUX hit each.NOM other.ACC
'The students hit each other. (LaTerza 2014: 123, ex. 4.48)

b. student je predstavio profesore jedne drgugima

student AUX introduced professor.PL.ACC each.ACC other.DAT
'The student introduced the professors to each other.' (LaTerza 2014: 124, ex. 4.51a)

c. Gosti su plesali jedni s drugima

guest.PL AUX danced each.PL.NOM with other.DAT
'The guests danced with each other.' (LaTerza 2014: 124, ex. 4.43)

We can once again use standard constituency tests to show that the two parts of the reciprocal form a constituent. The examples below show this using the fragment answer test.

(23) a. koga su studenti udarali?

who.ACC are student.PL hit
'Who did the students hit?'

b. jedan drugog

each.NOM other.ACC
'Each other.'

(24) a. kome je student predstavio profesore?

who.DAT is student introduce professor.PL.ACC
'Who did the student introduce the professors to?'

b. jedne drgugima

each.ACC other.DAT
'Each other'

(25) a. s kim su gosti plesali

with who are guests danced
Who did the guests dance with?

b. jedni s drugima

each.PL.NOM with other.DAT
'With each other'

The reciprocal can also occur in coordinations (26). While there is a preference for the reciprocal to be the first conjunct in a coordination, it is possible for it to occur as the second conjunct as well (27).

(26) a. Studenti su udarali jedan drugog i profesore

Student.PL.NOM AUX hit each.NOM other.ACC and professor.PL.ACC
'The students hit each other and the professors.'

b. Gosti su plesali jedni s drugima i s konobarima

guest.PL AUX danced each.PL.NOM with other.DAT and with waiter.PL.DAT
'The guests danced with each other and with the waiters.'

(27) a. ?Studenti su udarali profesore i jedan drugog

Student.PL.NOM AUX hit professor.PL.ACC and each.NOM other.ACC
'The students hit the professors and each other.'

b. Gosti su plesali s konobarima i jedni s drugima

guest.PL AUX danced with waiter.PL.DAT and each.PL.NOM with other.DAT
'The guests danced with the waiters and each other.'

Finally VP level material such as adverbs cannot come between the first part of the reciprocal and the second even if the two are separated by a preposition (28).

(28) Gosti su (graciozno) plesali (graciozno) jedni (*graciozno) s
guests are (gracefully) danced (gracefully) each.PL.NOM (*gracefully) with
drugima
other.DAT
'The guests danced gracefully with each other.'

2.3 Telugu

The Telugu reciprocal is created via doubling of the numeral quantifier *okaLLa* ('one'). Like the languages we have seen thus far, part of the reciprocal matches the case of its antecedent. The difference between Telugu and the languages thus far is it is the second element in the reciprocal that agrees in case with the antecedent. The second *okaLLa* in (29a) is nominative matching with the subject antecedent, but it is dative in (29b) matching with the quirky subject (Messick and Raghotham to appear).

(29) valḷu okari-ni okaḷḷa tiṭṭu-konn-aa-ru
3PL.NOM one-ACC one.NOM scold-VR-PST-PL
'They scolded each other.'

(30) valḷa-ku okar-anṭe okari-ki iʃṭam
3PL-DAT one-OBL one-DAT like
'They like each other' (Messick and Raghotham to appear: ex. 6-7)

Also unlike the other languages discussed here, locally bound reflexives in Telugu also show case-matching with their antecedents (Subbarao and Murthy 2000; Messick and Raghotham to appear) as shown in (31).

(31) a. vanaja tana-ni tanu poguḍu-kon-di

Vanaja.NOM 3SG-ACC 3SG.NOM praise-VR-F.SG
'Vanaja praised herself$_F$.'

b. vibha-ki tana-miida tana-ki koopam wacc-in-di

Vibha-DAT 3SG-on 3SG-DAT angry become-PST-F.SG
'Vibha got angry at herself.' (Messick and Raghotham to appear: ex. 2)

These elements can occur in coordinations as shown in (32), once again casting doubt on analyses that have the case-agreeing element moving in order to agree with the antecedent. Similarly, the two parts of the reflexive must be scrambled together as shown in (33) suggesting that the two form a constituent.

(32) vaḷḷa-ku rani-anṭe mariyu okar-anṭe okkari-ki iʃṭam

3PL-DAT rani-OBL and one-OBL one-DAT like
'They like Rani and each other.' (Messick and Raghotham to appear: ex 105)

(33) okara-ni okaḷḷu vaḷḷu tiṭṭu-konn-aa-ru

one-ACC one.NOM 3PL.NOM scold-VR-PST-PL
'They scolded each other.' (Messick and Raghotham to appear: ex 101)

Another similarity between the Telugu facts and Icelandic is that the complex reflexive and reciprocal can be split apart by an adposition. In (32), the postposition *miida* can intervene between the two parts of the Telugu reciprocal.

(34) vaḷḷa-ku okari-miida okari-ki koopam wacc-aa-ru

3PL-DAT one-on one-DAT angry become-PST-PL
'They got angry at each other.' (Sreekar Raghotham p.c.)

3 The case Puzzle

The data in the sections above cast doubt on the analysis of case-matching reciprocals in terms of e-raising of part of the reciprocal to the base position of the antecedent for the languages under examination. This forces us to analyze the case facts differently than Sigurðsson et al. (2022). The data suggests that (part of) of the reciprocal may match in case with its antecedent while staying *in situ*. By allowing the matching to happen in situ, the case-matching part can stay a constituent with the case independent part. There are several theories that posit a type of feature matching relation between a locally bound anaphor and its antecedent (Kratzer 2009; Hicks 2009; Heinat 2009; Bader 2011; Reuland 2011; Wurmbrand 2012, 2017; Antonenko 2011; Sundaresan 2018; Murphy and Meyase 2022; Messick and Raghotham to appear; Paparounas and Akkuş to appear). While the analyses differ in the details, all the cited authors agree that antecedent and anaphor may enter into some sort of feature sharing relation without the anaphor moving to the position of the antecedent. For concreteness, we will adopt an analysis that makes use of Feature Transmission (Kratzer 2009). The relevant components of such analyses are defined in (35).

(35) a. *Predication* (*Spec-Head agreement*)

When a DP occupies the specifier position of a head that carries a λ-operator, their ϕ-features and case features unify. modified from (Kratzer 2009: 196 ex. 19)

b. *Feature Transmission*

The ϕ-features and case feature of a bound DP are unified with the ϕ-feature of the verbal functional head that hosts its binder. modified from (Kratzer 2009: 195 ex. 18)

For Kratzer, transmission of features from the antecedent to an anaphor is mediated via the functional head that introduces the antecedent in its specifier (see also Reuland 2011;

Antonenko 2011; Murphy and Meyase 2022; Paparounas and Akkuş to appear for similar proposals). This relation is built off the binding relation, hence Transmission is only possible when their is a c-command relation between the binder and anaphor. While Kratzer's focus was on ϕ-feature, case-agreeing reciprocals reveal that case features can also be transmitted from antecedent to *hvor* (cf. Landau 2008 on case transmission in control structures). We assume that *hvor* and its cross-linguistic counterparts are transmitted the case feature of the antecedent via the above mechanisms. The other e-associate, i.e., *annar* and its counterparts, are assigned structual case given its position in the clause.[6]

For concreteness, we will assume accusative case is assigned via dependent case rules (Marantz 1991; Baker 2015; Wood 2011, 2017). The assignment of accusative is determined by the rule in (36). We assume that nominative is the unmarked case in Icelandic and is the morphological realization of a case feature that is not valued during the course of the derivation (see Bittner and Hale 1996; Levin and Preminger 2015; McFadden 2018 for this treatment of nominative in other languages).

(36) If a DP α has no case feature at spellout, it is assigned accusative iff there is some other DP α' which is visible to α [i.e., α' is merged into the structure prior to the spell out of α: TM and GH] and where (a) α' has no case feature and (b) α' c-commands α. (Wood 2011: 8)

Let's walk through the example in (37), to see how the proposal works for a simple example.

(37) Þeir hafa séð hvor annan

they.NOM.M.PL have seen each.NOM.M.SG other.ACC.M.SG
'They have seen each other.'

Following Sigurðsson et al. (2022), we take the Icelandic reciprocal to be a DP, where *annar* is the N-head and *hvor* is a quantificational D-head.[7] We assume since *hvor* resides

at the edge of the DP it is accessible to operations in the higher phase (Bošković 2012; Despić 2011), such as Feature Transmission. When the subject is merged into the specifier of *vP* and the phase is completed, the DP headed by *annan* will be assigned accusative case by the rule in (36) as shown in (38).

(38) $[_{vP}$ they$_{uK}$ [v $[_{VP}$ talked $[_{DP}$ each $[_{nP}$ other$_{uK:acc}]]]]]$

ACC

The subject and v undergo Predication ① and the v transmits its unvalued case feature to *hvor* ② as shown in (39). When the structure is spelled out to the interfaces, the unvalued case feature on the subject and *hvor* is realized as nominative, while the case on *annar* is realized as accusative.

(39) $[_{vP}$ they$_{uK}$ [v $[_{VP}$ talked $[_{DP}$ each$_{uK}$ $[_{nP}$ other$_{uK:acc}]]]]]$

① ②

In this section we proposed that case-matching between *hvor* (and its counterparts in other languages) receives its case not via movement to the base position of its antecedent, but via in situ Feature Transmission.[8] In the next section, we propose that for PPs, *hvor* does undergo movement, but only short movement to the edge of PP. From this position, it may undergo Feature Transmission with the antecedent.

4 The position puzzle

The puzzle about why a P may intervene between the two e-associates cannot be solved via e-raising out of the PP into the extend projection of the verb. As we have seen, for the languages that have case-matching reciprocals, the two e-associates and the P appear to form a constituent. We suggest that the higher e-associate does move, but only to the edge of PP. This movement in many respects mirror movement found for negative concord items (NCIs) in Russian. NCIs are morphologically complex, being composed of a wh-item and a

negative prefix. In cases of PPs, the negative concord reading is only possible if the negative prefix comes before the preposition. If the negative prefix comes after the preposition, only the double negative reading is possible as shown in (40).

(40) a. Vera ne sdelala salat iz ni-čego
Vera NEG made salad from *n*-what
'Vera did not make salad out of nothing.' *NC/DN

b. Vera ne sdelala salat ni iz čego
Vera NEG made salad *n* from what
'Vera did not make a salad out of anything.' NC/*DN

Fitzgibbons 2010:70 argues that *ni*-movement moves the negative prefix to the left edge of the PP domain.[9] Once at the edge of PP, the negative prefix may undergo AGREE with the sentential negation *ne* giving rise to the negative concord interpretation (40b). If the negative prefix, does not undergo movement, but instead stays within the complement of the P as in (40a), then it is not local enough to enter an AGREE relation with the sentential negation, hence the double negation interpretation arises. On the assumptions that P is a phase head (Abels 2003) and AGREE is phase bounded (Chomsky 2001), we can account for this distinction elegantly, In (40a), the negative prefix is in the spell-out domain of the P phase head, hence is inaccessible for agreement with the sentential negation in the higher phase. In (40b), as the negative prefix has moved to the edge of the phase, it has escaped the spell out domain of the P and is hence accessible for agreement relations in the higher phase.

We suggest a similar analysis for the reciprocals discussed here: in cases where the reciprocal wraps around a preposition, there is something like e-raising of *hvor*, but only to the left edge of the PP and not further.[10] Evidence for this short movement comes from two sources, ditransitives and coordinations. First, if the PP is preceded by another argument within the VP, the longer movement argued for by Sigurðsson et al. predicts that

the reciprocal should move across that argument. This prediction is not borne out. As shown in (41), sentences where *hvor* comes above the second internal argument but below the main verb are judged as unacceptable.[11]

(41) a. *Þeir hafa sent hvor pakka til annars.
they.NOM.M.PL have sent each.NOM.M.SG package.ACC.SG to other.GEN.M.SG
'We have sent a package to each other.'

b. *Þeir hafa sagt hvor sögur af öðrum.
they.NOM.M.PL have said each.NOM.M.SG stories of other.DAT.M.SG
'They have told stories about each other.'

c. *Þeir munu tala hvor við Astrid um annan.
they.NOM.M.PL will talk each.NOM.M.SG to Astrid about other.ACC.M.SG
'They will talk to Astrid about each other.'

Rather, the displacement of *hvor* targets a position below the first argument, which is expected if the reciprocal moves to the edge of the PP.[12] A search in the Icelandic Gigaword Corpus also yielded no results for the configuration in (41), but multiple results for the configuration in (42). Note the higher internal arguments in (41) and (42) are indefinite DPs or PPs and hence are not candidates to undergo object shift out of the extended VP.

(42) a. Þeir hafa sent pakka hvor til annars.
they.NOM.M.PL have sent package.ACC.SG each.NOM.M.SG to other.GEN.M.SG
'They have sent a package to each other.'

b. Þeir hafa sagt sögur hvor af öðrum.
they.NOM.M.PL have said stories each.NOM.M.SG of other.dat.m.sg
'They have told stories about each other.'

c. Þeir munu tala við Astrid hvor um annan.
they.NOM.M.PL will talk to Astrid each.NOM.M.SG about other.ACC.M.SG
'They will talk to Astrid about each other.'

Second, it is typically fine to coordinate two DPs under a single preposition as shown in Icelandic (43a), Greek (43b) and BCS (43c).

(43) a. Þeir töluðu alltaf um kvikmyndir og stjórnmál
they.NOM.M.PL talked always about movies and politics
'They always talked about movies and about politics.'

b. milisan me tus mathites ke tus kathigites
talk.3PL with the students and the professors
'They talked with the students and the professors.'

c. plesali su s konobarima i gostima
danced are with waiters and guests
'They danced with the waiters and guests.'

However it is not possible to coordinate the reciprocal with another NP under a single preposition as shown for all three languages (44).

(44) a. *Þeir töluðu alltaf hvor um annan og stjórnmál
they.NOM.M.PL talked always each.NOM.M.PL about other and politics
Intended: 'They always talked about each other and about politics.'

b. *milisan o enas me ton allo ke tus mathites
talked.3PL the one with the other and the students
Intended: 'They talked with each other and the students.'

c. *Gosti su plesali jedni s drugima i konobarima.
guests are danced each.NOM with other.DAT and waiters.DAT
Intended: 'The guests danced with each other and the waiters.'

Under the analysis where the higher e-associate undergoes movement to the left edge of the PP, then this example can be ruled out via the CSC, as we have asymmetric extraction out of a conjunct as schematized for Icelandic in (45).[13]

(45) $[_{PP}$ hvor$_i$ um $[_{\&P}$ $[_{DP}$ t_i annan$]$ og $[_{DP}$ stjórnmál$]]]$

Further evidence for this analysis comes from the innovative reciprocal in Icelandic. This reciprocal does not wrap around the P, both parts of the reciprocal stay as the complement to the preposition, as shown in (46).

(46) Þeir höfðu talað um hvorn annan
they.NOM.M.PL had talked about each.ACC.M.SG other.ACC.M.SG
'They had talked about each other.' (Sigurðsson et al. 2022: ex. 20)

The innovative reciprocal can be coordinated with another NP under a single preposition, because in these cases *hvor* is not moving, but rather stays within the first conjunct.

(47) Þeir töluðu alltaf um hvorn annan og stjórnmál
they.NOM.M.PL talked always about each.ACC.M.PL other and politics
'They always talked about each other and politics.'

Note that the innovative reciprocal does not match in case features with its antecedent. It instead undergoes case concord with *annan*, hence both *hvor* and *annan* appear in the same case: accusative (for analyses of concord phenomenon see Toosarvandani and van Urk 2014; Norris 2014; Grabovac 2022). We suggest that it is not accidental that the reciprocal that does not wrap around the P also does not show case matching with its antecedent. We propose that this follows from Feature Transmission being phase bound (Kratzer 2009: 197). On Chomsky (2000, 2001)'s conception of spell out, the edge of the phase is not spelled out with phase head complement, hence is accessible to operations in the higher domain. Based on these assumption, we make the following cross-linguistic prediction given in (48).[14]

(48) P-Edge Generalization

A reciprocal embedded within a PP can only copy the case feature of its antecedent, if it occupies a position at the edge of the PP.

While the languages we have looked at thus far are head initial, Messick and Raghotham (to appear) report a mirror image of the facts for the head final Telugu. As we have seen a postposition may intervene between the two parts case-matching reflexive and reciprocal (49).

(49) valḷa-ku okkari-miida okkari-ki koopam wacc-aa-ru

3PL-DAT one-on one-DAT angry become-PST-PL
'They got angry at each other.'

This again appears to conform to the generalization in (48), though the case-matching element is at the right edge of the PP instead of the left edge.

4.1 The Icelandic hybrid

A potential counterexample to the proposal that case matching requires the target to be at the PP edge comes from the Icelandic hybrid construction discussed in Sigurðsson et al. 2021. In this construction, the reciprocal does not wrap around the P, hence it does not appear that *hvor* has moved to the edge of the PP. Nevertheless, *hvor* appears in nominative, the same case as its antecedent in (50). We can once again see that there is no movement in these examples, as like the innovative reciprocal, the hybrid reciprocal does not violate the CSC when it is coordinated with another DP under a single preposition, as shown in (51).

(50) Þeir höfðu talað um hvor annan

they.NOM.M.PL had talked about each.NOM.M.SG other.ACC.M.SG
'They had talked about each other.

(51) Þeir töluðu alltaf um hvor annan og stjórnmál

they.NOM.M.PL talked always about each.NOM.M.PL other and politics
'They always talked about each other and politics.'

As Sigurðsson et al. (2021) note however, in these constructions, the nominative does not appear to be the result of feature-matching with the antecedent. Instead, the nominative displayed by *hvor* appears to be a form of default case. Evidence for this position comes from the fact that the nominative case appears even when the antecedent is dative, as shown in (52).

(52) að undir niðri líki þeim við hvor annan
that under neath like them.DAT with each.NOM other.ACC
'that deep down they like each other.' (Sigurðsson et al. 2021: ex. 12)

This suggests that (50) is not truly an exception to the correlation between case matching and the PP edge position. It appears that the e-associate must be at the edge of the PP to undergo Feature Transmission with its antecedent. If it does not, the case of the e-associates may undergo case concord, as in the innovative reciprocal (46), or one of the associates may occur in the default case, as in the hybrid (50).

5 Conclusion

In this paper, we presented data that show that complex reciprocals that match in case with their antecedents do not undergo movement to the base position of their antecedent. The arguments against such a movement operation came from constituency and the CSC. This was shown for Icelandic, but also Greek, BCS, and Telugu as well. This suggests that case matching must occur between an antecedent and reciprocal with the reciprocal staying *in situ*. We present a way forward using previous theories that allow for feature-matching between an anaphor and antecedent without need for movement.

In cases where the reciprocal appears to wrap around an adposition, we argued that the such wrapping is derived via movement. We presented evidence once again from coordination that such a movement can induce a CSC violation, but since the two parts of

the reciprocal and the P still behave as if they were a constituent, we argued that this movement was short: only to the edge of the PP. We also showed that this analysis made correct predictions about the word order found in VPs with two internal arguments. We argued that such a movement facilitated the feature-matching relation between the reciprocal and the antecedent (building off of a similar analysis put forth for NCIs in Russian). This analysis makes a cross-linguistic prediction that case-matching reciprocals must move to the edge of the PP in order to undergo Feature Transmission. We discussed potential counterexamples to this generalization, and show how they may fit within the system.

The findings presented here have many implications for the syntax of Icelandic clausal structure, locally bound anaphora, and agreement. First, since we argued that e-raising (if it happens at all) does not target the initial merge position of the reciprocal's antecedent. This means that we do not need short verb movement to Voice in order to derive the correct word order, hence this paper defuses an argument from Sigurðsson et al. (2021) that such an operation exists in Icelandic. Second, the fact that we get case matching between an anaphor and its antecedent provides a novel argument that at least some feature matching between anaphor and antecedent must be derived via morphosyntactic Feature Transmission. Second, the analysis of P intervention between the two e-associates presented in this paper provides a new argument for the phase status of PP and the accessibility condition on Feature Transmission.

Finally, these findings also bear on the question of whether the domain for Principle A of the binding theory should be reduced to the domain of phases. The interaction we see with regards to PPs seems like a fertile testing ground for these proposals. It is often assumed in the agreement literature that PPs block AGREE between an element outside the PP with an element within the complement of P (see Bruening 2021:433), but at least in some languages, like English (or the Icelandic innovative reciprocal), binding of a reflexive or reciprocal in a PP is acceptable. If the generalization in (48) is correct, then it shows

that languages that show case matching between an anaphor and antecedent must have part of the anaphor move out of the complement of the P to undergo Feature Transmission. In fact, other languages have part of a complex reflexive/reciprocal appear at the edge of PPs even if they do not match in case (see footnote 14). A number of factors may be at play. One factor might be the transparency of PP to other operations such as movement. There does appear to be a tendency that languages that do have Ps intervening between the two parts of a complex reciprocal do not allow for P-stranding under A'-movement. Another factor may be the structure of the PP itself, as the structure of the PP does influence the possibility of binding in some languages (Bassel 2018). A final consideration is whether the anaphor in the complement of P may allow for exempt uses (Pollard and Sag 1992; Reinhart and Reuland 1993; Charnavel 2019). All of these different dimensions may play a role in explaining the differences between languages and the relationship between binding, phases, and agreement in PPs. We are not able to explore all of these dimensions here, but hope that our discussion here spurs on more research in this area.

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Notes

*For helpful comments, suggestions, and judgments related to this work, we thank two *Linguistic Inquiry* reviewers, Mark Baker, Željko Bošković, Christos Christopolous, Magnúsína Laufey Harðardóttir, Ivana Jovović, Sreekar Raghotham, Ken Safir, Einar Freyr Sigurðsson, Halldór Ármann Sigurðsson, Pétur Valsson, Jim Wood, the participants of the Syntax Reading Group at Rutgers, the attendees of an April 2022 colloquium at UMass-Amherst, and the participants of the Syntax Seminar in the Fall of 2022 at Rutgers. The usual disclaimers apply.

[1]As Sigurðsson et al. (2022) note (their footnote 19), it is difficult to create constructions with a dative subject and *annar* in the nominative case. It is much easier to create examples with a dative subject and PP object. Sigurðsson et al. leave the reason for this distinction open, but an answer may lie in the so-called Anaphor Agreement Effect (AAE) (Rizzi 1990; Woolford 1999; Murugesan 2022), as nominative objects control agreement in Icelandic, and the AAE bans anaphors from occurring in positions that control non-trvial ϕ-agreement, then the reason a reciprocal cannot occur in a nominative, agreement controlling, position is the same reason why the anaphor *sig* cannot occur in the same position, as shown below.

(53) *Konunum leiddust sig
women.DAT bored.3PL REFL.NOM
Intended: 'The women were bored with themselves.' (Murugesan 2022: 40 ex. 3)

Presumably both reciprocals and reflexives in agreement controlling position are ruled out via the AAE.

[2]Sigurðsson et al. assume the extended projection of the verb includes a VoiceP that dominates the vP and that head movement of the verb terminates at the voice head. They

note in footnote 12 of their paper, that their analysis is also compatible with a view where vP is immediately dominated by an AspectP, and the final instance of head movement of the main verb targets the aspect head as in Wood 2018.

[3]The judgments reported here conform to the grammar of the second author of this paper. In discussions with other native Icelandic speakers, we did encounter variation in the acceptability of these examples, with some speakers finding them degraded. It should be noted that for all speakers the examples in (4) are more acceptable than the counterparts in (8), where only one e-associate is displaced without the other. In addition, we found a naturally occurring example in the Icelandic Gigaword Corpus (Steingrímsson et al. 2018) where the two e-associates are displaced together, as shown in (54).

(54) og hvor öðrum trúað fyrir sínum hjartans málum
and each.NOM other.DAT confided for self's heart.THE.GEN matters
"...and confided in each other their heart's desires." (The Icelandic Gigaword Corpus)

We take this to indicate that displacement of the two e-associates together is possible at least for some speakers, and leave investigating the source of degradation for other speakers as a matter for future research.

[4]Greek judgments are from Christos Christopolous (p.c).

[5]Judgments for non-attributed BCS examples are due to Ivana Jovović (p.c.).

[6]This split is reminiscent of the idea in (Heim et al. 1991: pp. 73; ex. 22) that the (trace of) *each* is the anaphor in English reciprocals, while *other* is a type of R-expression. If this idea is on the right track, then it follows that Feature Transmission targets the anaphoric portion of the reciprocal.

[7]It is possible that reciprocals have a more complex internal structure (Déchaine and Wiltschko 2004; Labelle 2008), but we leave this issue as a matter for further research.

[8]One may wonder if these data can be analyzed in terms of Upward/Reverse Agree, where *hvor* probes upward and agrees with its antecedent in case features (for the use of Reverse Agree between anaphor and antecedent, see Bader 2011; Wurmbrand 2012, 2017 among others). While this alternative seems plausible one obstacle that needs to be overcome is that Agree is typically thought to be subject to *minimality*, such that a probe must target the most local goal. This does not appear to be the case for reciprocals in Icelandic or BCS, where the higher e-associate can Agree with a nominative antecedent despite the presence of a closer NP. This is shown in (55) for Icelandic and (56) for BCS.

(55) Nemendurnir sögðu kennaranum hvor frá öðrum
students.THE.NOM told teacher.THE.DAT each.NOM from other.DAT
'The students told the teacher about each other.'

(56) Studenti su predstavili profesore jedni drugima
students.NOM AUX introduced professors.ACC one.NOM other.DAT
'The students introduced the professors to each other.' (LaTerza 2014: 123, ex. 4.50a)

If one wished to account for these facts under Reverse Agree, we would need to augment it in some way so that the probe can look past a closer NP to match with another further NP.

[9]She assumes a highly articulated PP structure, where PPs project the equivalent of a clausal CP.

[10]The movement put forth here also has some similarities to movement analyses of R-pronouns in Germanic languages like Dutch (van Riemsdijk 1978; Koopman 2000; den Dikken

2010). R-pronouns are locative pronouns that can occur in prepositional phrases, however the order of the elements is R-pronoun $\prec$ P unlike full DP complements which follow the preposition. Below is an example from Dutch.

(57) Ik heb de bal daar.op gelegd
I have the ball there.on put
'I have put the ball on there.'

The authors cited above argue that this word order is derived via movement from the complement position of the P to a functional projection at the edge of the PP, similar to our analysis of *hvor* and other e-associates here.

[11]Thanks to an anonymous reviewer for pointing out this prediction.

[12]Note that it is possible for the reciprocal to optionally surface in a position above the participial.

(58) a. Þeir hafa hvor sent pakka til annars.
they.NOM.M.PL have each.NOM.M.SG sent package.ACC.SG to other.GEN.M.SG
'We have sent a package to each other.'

There are at least possible two explanations for this construction, both independent of the topic at hand. Either this could be an instance of quantifier movement (see, e.g., Svenonius 2000) or an instance of a scattered reciprocal (e.g., Kobayashi 2021). Distinguishing between these two options, however, is beyond the scope of this paper, hence we leave this open pending further research.

[13]If we are correct that *hvor* and its cross-linguistic counterparts are a quantificational D-heads, then the movement involved here appears to be head to spec movement. See

Harizanov (2019) for a recent defense of this possibility.

[14] Note that this generalization is a one way generalization. There are languages like Russian and French that move part of the reciprocal to the edge of PP, but do not show case agreement with their antecedent as shown in (59) and (60).

(59) Na vybor-ax politik-i golosuj-ut drug za drug-a
on election-PL.LOC poitician-PLL.NOM vote-PRS.3PL other for other-ACC
'On the elections, the politicians vote for each other.' (Letuchiy 2011: 314, ex. 3)

(60) Vadius et Trissotin s' adressent l'un à l'autre des louanges
Vadius and Trissotin SE address.PRS.PL the.one to the.other DET praises
ridicules
ridiculous
'Vadius and Trissotin address ridiculous praises to each other.' (Labelle 2008: 846,ex. 34d)