7.   Appendices:

Appendix A — The structural properties of reciprocals:

In Section 1, we followed Bar-Asher Siegal (2016) and LeTourneau (1998) and adopted the

hypothesis that morphologically T-marked reciprocals in JA *always* project *two* (i.e., both

external and internal) syntactic arguments even when the internal argument is not realized

overtly, as illustrated in (70) (= (15)).

(70) l-ʔaxu₁   w-ʔuxt-uh₂   *t-ʕaawanu*
     the-brother.NOM and-sister-his.NOM **T**-helped

     { maʕ   baʕð̣-hum   1-baʕð̣$_{<1↔2>}$ / [**e**]**RECIP$_{<1↔2>}$** }.
       with   some-them.GEN   the-some.GEN

     'The brother and his sister helped each other.'

In the earlier draft of this paper, we presented syntactic support for this hypothesis based upon

our observations on anaphor binding in JA. We pointed out that our syntactic arguments nicely

dovetail with the semantic motivation provided by Bar-Asher Siegal and support the postulation

of an empty reciprocal anaphor. One of the anonymous reviewers, however, questioned the

legitimacy of the data we presented and insisted on the rejection of the paper. We therefore have

decided to withdraw the section featuring the binding arguments because, first, there already are

enough arguments in the field to support the postulation of an empty reciprocal anaphor in

Semitic languages, and second, it is not our core proposal. (We appealed to an implicit reciprocal

anaphor to capture only one phenomenon — when the generally required agentive object of

Form 6 and Form 8 T-marked predicates is missing and at the same time obligatory collectivity is

detected, as in (26b) (Section 2.3), (55') (Section 4.2), and (64) (Section 4.3). There, we argued

that the postulation of an implicit reciprocal anaphor makes available the plural eventualities

required by the T-morpheme as a collectivizer, assimilating the examples in question to other

general cases. It provided, so to speak, the last piece to complete our arguments for implicit

anaphors.)

In the remainder of this appendix, we will summarize our binding arguments in Appendix A i, the reviewer's objection in Appendix A ii, and discuss some potential issues involved in our binding arguments in Appendix A iii.

Appendix A i — Anaphor binding in reciprocals:

Support for the analysis postulating an empty reciprocal anaphor in the morphologically T-marked reciprocals comes when we examine binding. First, we confirm the preliminary facts on anaphor binding in JA, which proceeds in four steps. Let us start with the examination of a *one-place* construction whose verbs do *not* involve morphologically marked reflexive or reciprocal forms. In such a construction in (71a–b) below, a SELF-anaphor introduced in an adjunct (**Ajct**) phrase *cannot be bound by the subject*.

(71) a. **l-walad**₁ *ðiħik* [**Ajct** baʕid bahdalet { ṣħaab-uh / ***nafs-uh**₁ }].
the-boy.NOM laughed after disparagement.GEN friends-his.GEN self-him.GEN
'The boy laughed after the disparagement of {his friends /*himself}.'

b. **l-mudiir**₁ *ʕimil* bi-dʒiddiyeh [**Ajct** baʕid taʃdʒiiʕ
the-manager.M.NOM worked in-seriousness.GEN after encouragement.GEN
{ l-muwaððafiin / ***nafs-uh**₁ } ʕala ʃ-ʃuɣul].
the-employees.GEN self-him.GEN on the-work.GEN
'The (male) manager worked hard after the encouragement of { the employees / *himself } for work.'

In (71a), for example, when the nominal in the adjunct *ṣħaab-uh* 'his friends' is replaced by the SELF-anaphor *nafs-uh* 'himself', the sentence becomes ungrammatical, apparently violating Principle A of the binding theory (Chomsky 1981), or some other locality constraint, when this anaphor attempts to refer to the subject *l-walad* 'the boy'. (We will examine and reject the analysis postulating a local PRO subject within NP in our examples in **Appendix A iii** below, where we will also discuss the issues concerning c-command.)

The second preliminary observation is that, in a *two-place* construction without

morphological T-marking as in (72a–b) below, the same restriction is observed but with an

additional fact emerging. That is, the SELF-anaphor in the adjunct continues to be prohibited

from being bound by the subject but now is *permitted to be bound by the object NP*.

(72) a. l-waladeen₁ ʕaawanu **l-bint₂** [Ajct ʕala taṭwiir
    the-boys.DL.NOM helped the-girl.ACC on improvement.GEN

    { *nafs-hum₁ / **nafs-ha₂** }].
      self-them.GEN self-her.GEN
    'The two boys helped the girl with the improvement of { *themselves / herself }.'

  b. s-sadʒiineen₁ waaṭu **Zeed₂**
    the-inmates.M.DL.NOM colluded Zeed.ACC

    [Ajct ʕala tahriib { *nafs-hum₁ / **nafs-uh₂** } min s-sidʒin].
      on decampment.GEN self-them.GEN self-him.GEN from the-jail.GEN

    'The two male inmates colluded with Zeed on the decampment of
    { *themselves / himself } from jail.'

In (72a), for example, the anaphor *nafs-hum* 'themselves' cannot be bound by the subject *l-*

waladeen 'the two boys' but *nafs-ha* 'herself' can be bound by the object *l-bint* 'the girl'. We

have observed, in other words, that the binding of the SELF-anaphors in the adjuncts in the *two-*

place construction is oriented toward the *objects* rather than the subjects in sentences like (72a–

b) in JA.[28]

In the third step of preliminary investigation, we witness that the same binding facts are

observed when the *two-place verbs* are *morphologically T-marked* and select a PP complement,

as in (73a–b).[29]

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[28] How this state of affairs arises is an issue we cannot pursue in this work. See Antonenko (2012), for example, for

relevant discussion on how the subject/object-orientation of anaphor binding is achieved in syntax.

[29] Morphological T-marking per se in these sentences does not induce reflexivization or reciprocalization. Recall our

discussion on the way its semantic function is determined in Section 4.

(73) a. l-waladeen₁   *t*-ʕaawanu   **maʕ l-bint₂**   [Ajct ʕala taṭwiir
     the-boys.DL.NOM   **T**-helped   with the-girl.GEN   on   improvement.GEN

     { *nafs-hum₁   / **nafs-ha₂**   }]
       self-them.GEN   self-her.GEN

     'The two boys helped the girl with the improvement of { *themselves / herself }.'

   b. s-sadʒiineen₁   *t*-waaṭu   **maʕ Zeed₂**
      the-inmates.M.DL.NOM   **T**-colluded   with   Zeed.GEN

     [Ajct ʕala tahriib   { *nafs-hum₁   / **nafs-uh₂**   } min s-sidʒin   ].
       on   decampment.GEN   self-them.GEN   self-him.GEN   from the-jail.GEN

     'The two male inmates colluded with Zeed on the decampment of { *themselves /
     himself } from jail.'

Therefore, the restriction in a two-place construction imposed on the binding of *SELF-anaphors in adjuncts* should perhaps be described as their "complement-orientation." The readers should note here that we are NOT claiming that anaphors in JA in general cannot refer to the subject. We are certainly aware that *a SELF-anaphor appearing as an object is subject-oriented* as seen in (1) in Section 1. It, however, is not a matter of concern to us. We are reporting cases in which *anaphors appearing in adjuncts refer to the object of a preposition/verb rather than a subject*.

     The forth and the final preliminary observation is that, when the verbs in (72) and (73) select an *overt reciprocal anaphor* as their complement, the SELF-anaphor in the adjunct can naturally be oriented toward this complement, whether the verb is morphologically unmarked as in (74) or marked as in (75).

(74) a. l-waladeen<1+2>   ʕaawanu **baʕḍ-hum**   **l-baʕḍ<1↔2>**
     the-boys.DL.NOM helped   some-them.ACC the-some.ACC

     [Ajct ʕala taṭwiir   **nafs-hum<1+2>**].
       on   improvement.GEN self-them.GEN

     'The two boys helped each other with the improvement of themselves.'

   b. s-sadʒiineen<1+2>   waaṭu   **baʕḍ-hum**   **l-baʕḍ<1↔2>**
      the-inmates.M.DL.NOM colluded   some-them.ACC the-some.ACC

     [Ajct ʕala tahriib   **nafs-hum<1+2>** min   s-sidʒin   ].
       on   decampment.GEN self-them.GEN   from   the-jail.GEN

     'The two inmates colluded with each other on the decampment of themselves from jail.'

(75) a. l-waladeen_{<1+2>}   *t*-ʕaawanu maʕ **baʕḍ-hum**   **l-baʕḍ**_{<1↔2>}
    the-boys.DL.NOM **T**-helped with some-them.GEN the-some.GEN

    [_{Ajct} ʕala taṭwiir   **nafs-hum**_{<1+2>}].
        on   improvement.GEN self-them.GEN

    'The two boys helped each other with the improvement of themselves.'

  b. s-sadʒiineen_{<1+2>}   *t*-waaṭu   maʕ   **baʕḍ-hum**   **l-baʕḍ**_{<1↔2>}
    the-inmates.M.DL.NOM **T**-colluded with   some-them.ACC   the-some.ACC

    [_{Ajct} ʕala tahriib   **nafs-hum**_{<1+2>} min   s-sidʒin   ].
        on   decampment.GEN self-them.GEN from the-jail.GEN

    'The two inmates colluded with each other on the decampment of themselves from jail.'

Note that this complement orientation is masked because the complement anaphor in turn is bound by the subject in each example. The facts observed in (72) and (73), however, urge us to consider that the SELF-anaphor *nafs-hum* 'themselves' in all of (74a–b) and (75a–b) becomes acceptable because it can be bound by the complement *baʕḍ-hum l-baʕḍ* 'each other' rather than the subject.

    Now, crucially to us, when the *overt* complement anaphors are *eliminated* from (75a–b), the SELF-anaphor in the adjunct can still be interpreted as referring back to the subject:

(76) a. l-waladeen_{<1+2>}   *t*-ʕaawanu **[e]**_{<1↔2>} [_{Ajct} ʕala taṭwiir   **nafs-hum**_{<1+2>}].
    the-boys.DL.NOM **T**-helped   on   improvement.GEN self-them.GEN

    'The two boys helped each other with the improvement of themselves.'

  b. s-sadʒiineen_{<1+2>}   *t*-waaṭu   **[e]**_{<1↔2>}
    the-inmates.M.DL.NOM **T**-colluded

    [_{Ajct} ʕala tahriib   **nafs-hum**_{<1+2>} min   s-sidʒin   ].
        on   decampment.GEN self-them.GEN from the-jail.GEN

    'The two inmates colluded with each other on the decampment of themselves from jail.'

If "morphological" reciprocals as in (76a–b) are analyzed as involving a one-place construction, their successful binding would remain mysterious, given that the SELF-anaphors in question are prohibited from being directly bound by the subject in a one-place construction, as we saw in (71). If, on the other hand, these sentences are analyzed as involving a phonetically empty

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anaphor in a two-place construction as indicated in (76a–b), the facts can be captured

straightforwardly, being assimilated to what we saw in (74) and (75).

Note further that the reciprocals in (76a–b) (now analyzed as involving a two-place

construction) make a sharp contrast with morphologically T-marked *reflexives* as in (77a–b)

below, which project only one argument syntactically. (cf. (13) in Section 1)

(77) a. **l-walad₁**   *t-*ʔaddab [Ajct baʕid taʔniib   { ṣħaab-uh   / ***nafs-uh₁**   }].
      the-boy.NOM **T**-behaved   after reprimand.GEN   friends-his.GEN   **self-him**.GEN

      'The boy behaved himself after the reprimand of { his friends / *himself }.'

   b. **l-walad₁**   *t-*ħammam [Ajct la-muraaðaat   { ʔumm-uh   / ***nafs-uh₁**   }].
      the-boy.NOM **T**-bathed   for-satisfaction.GEN   mother-his.GEN   self-him.GEN

      'The boy bathed himself for the satisfaction of { his mother / *himself }.'

In (77b) just above, for example, the nominal in the adjunct *ʔumm-uh* 'his mother' cannot be

replaced by the SELF-anaphor *nafs-uh* 'himself'.

The contrast between one-place and two-place constructions can also be demonstrated in

the opposite way when reflexivization is established *syntactically* as in (78a–b) below, where a

transitive verb selects a reflexive anaphor as its complement.

(78) a. l-walad₁   ʔaddab   **nafs-uh₁**
      the-boy.NOM behaved   self-him.ACC

   [Ajct baʕid taʔniib   { ṣħaab-uh   / ᵒᵏ**nafs-uh₁**   }].
        after reprimand.GEN   friends-his.GEN   self-him.GEN

      'The boy behaved himself after the reprimand of { his friends / ᵒᵏhimself }.'

   b. l-walad₁   ħammam   **nafs-uh₁**   [Ajct la-muraaðaat
      the-boy.NOM bathed   self-him.ACC   for-satisfaction.GEN

   { ʔumm-uh   / ᵒᵏ**nafs-uh₁**   }].
      mother-his.GEN   self-him.GEN

      'The boy bathed himself for the satisfaction of { his mother / ᵒᵏhimself }.'

Note that the SELF-anaphor in the adjunct can now refer back to the subject, presumably

because it is successfully bound by the object in accordance with the "complement orientation."

This object in turn is bound by the subject, letting the SELF-anaphor in the adjunct refer to the

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subject.

To sum up, close examination of binding in reciprocal constructions supports our hypotheses about "morphological" reciprocals: **(i)** T-marked reciprocals always project two syntactic arguments, and **(ii)** when T-marked reciprocals are not accompanied by an overt reciprocal anaphor, they involve a phonetically empty internal argument.

Table 4 describes the informants we consulted with in order to confirm the correctness of the first author's judgment on the JA examples presented directly above (and elsewhere in this paper). All investigations were conducted in the form of a questionnaire followed by post-hoc solicitation of additional comments. The stimulus sentences were presented with relevant discourses and/or contexts, and all of the judgments provided here unanimously supported our predictions.

Table 4:   Informants in the initial investigation of binding in JA.

Speaker	Number	Gender	Age	Number of linguists involved
Jordanian	At least 4, sometimes 5	2 females ・ 3 males	20s - 1 30s - 2 40s - 1 50s - 1	1

Appendix A ii — Reviewer's objection:

One of the anonymous reviewers questioned the credibility of the data supporting the complement-orientation of a SELF-anaphor in JA discussed above. S/he did not directly evaluate the examples we presented, describing them as "quite distracting" but instead provided what s/he described as "so naturally occurring" Twitter messages in (79)–(81) below (clipped from a larger discourse and rewritten in JA).

(79) …(**pro**) tʕaawanau maʕ el-ʕaduw ðˤidd **nafs-hum**.
(**pro**) T-cooperated with the-enemy against **self-them**
'**They** (= the Palestinians) cooperated with the enemy against **themselves**.'

(80) …(**pro**) tʕaawanu maʕ eṣ-ṣahaajneh ðˤidd **nafs-hum**…
(**pro**) T-cooperated with the-Zionists.GEN against **self-them**
'**They** (= the Palestinians) cooperated with the Zionists against **themselves**.'

(81) …**ṣibjaan eθ-θawrah we-l-ʔixwaan** tʕaamaru maʕ el-ʕaskar
fighters the-revolution and-the-brothers T-conspired with the-soldiers

ðˤidd **nafs-hum**.
against **self-them**

'**The fighters of the revolution and the brothers**[30] conspired with the soldiers against **themselves**.'

All of the original Twitter messages involved Standard (literary) Arabic perhaps mixed with each Tweeter's own (spoken) dialect. The reviewer claimed that the anaphor in these examples can be bound by the subject rather than the object, and hence provides direct counterexamples to "the complement-orientation of an anaphor from within the adjunct PP," which we reported on some JA sentences. (Recall that, in our binding arguments, we did NOT deny the subject-orientation of an object anaphor in JA.)

We rewrote those Twitter examples into JA and had them checked by 19 Jordanian

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[30] "The brothers" here refer to the members of the Islamic brotherhood party.

speakers in total.[31] These informants all reported that the anaphor in each of these examples cannot refer to the subject. Although our paper was written with the intention of presenting empirical and theoretical studies strictly on Jordanian Arabic, we decided to extend our investigation from JA to other Arabic dialects, though in a very small scale, since we surmised that this discrepancy of judgment may have arisen from some dialectal variations we were not aware of. Again, we rewrote (79)–(81) in four distinct dialects and had them examined by one each speaker of Kuwaiti, Saudi, Egyptian and Palestinian Arabic. The result we obtained was the same — the anaphor binding by the subject was rejected by all of those informants.

Moreover, we obtained one interesting observation in our post-hoc survey. One informant pointed out to us that, if these sentences were ever accepted (though marginally), the SELF-anaphors are required not to refer to the subject but to some different people. For example, (79) and (80) would have to be interpreted as "They (= the Palestinian betrayers) cooperated with the enemy/Zionists **against their** (= the Palestinian betrayers') **fellow Palestinians**." Likewise, (81) would have to be interpreted as "The (betraying) fighters of the revolution and the brothers conspired with the government's soldiers **against their** (= the betraying fighters') **fellow fighters and brothers**." Upon receiving this input, we catechized the other informants and received a unanimous reaction that they can also stretch their interpretation along this line if they endeavor to. (Some had the impression that such extended interpretation might be easier in Standard Arabic than in their respective dialects.) In other words, there seems to be a way to permit these sentences marginally while the usual sentence-internal anaphor binding is still prohibited in a fair number of dialects in Arabic. The Tweeters in question might have found

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[31] No discourse or context was added in our investigation of the Twitter examples.

nafs-hum 'themselves' permissible for the intended readings because the subjects' deeds were directed against **their** (= the subjects') **fellow** people, which involves a nuance of reflexivity. See Carroll (1986) for relevant discussions on such marked uses of reflexives, which she calls "non-reflexive anaphors."

We also believe that (79)–(81) involve the pragmatic difficulty with the complement orientation of the anaphor binding. It is rather difficult to imagine natural pragmatic situations in which "A cooperates/conspires with B against B" makes sense (especially when A is Muslims and B is Zionists). We surmise that this interpretive restriction may have encouraged some Tweeters to bend the grammatical requirement for the complement orientation of anaphor binding.

Table 5 describes the informants involved in our investigations of the Twitter examples (79)–(81).

Table 5:　Informants in the investigation of the Twitter examples.

Speaker	Number	Gender	Age	Number of linguists involved
Jordanian	19	2 females・17 males	20s - 15 30s - 2 40s - 1 50s - 1	2
Saudi・Palestinian・Kuwaiti・Egyptian	1 each, totaling 4	3 females・1 male	30s - 4	2

The reviewer, who describes her/his own dialect as "close to the Palestinian dialect," reacted to our responses above as follows. S/he finds the Twitter examples "perfectly grammatical," in which "the anaphor refers to the subject. It may never refer to the object of preposition; a personal pronoun would be used for that." S/he also states "the rules of anaphora, at least as pertaining to the topic of the paper, are not different in Standard Arabic compared to the dialects in question … or shall I say my dialect," and also "I am not aware of cross-dialectal

variation that would target such structures, and I doubt there is one." The editor of *Glossa* also

solicited judgments on the Twitter examples (79)–(81) from the three syntacticians the reviewer

suggested and found that "two of them, Saudi and Jordanian respectively, answered that they did

indeed share the judgments of the reviewer."

Finally, we decided to invite four other Arabic linguists anew to examine some key data

(82)–(85) below, hoping that such judgments made by linguists can be regarded equally as

trustworthy as those provided by the reviewer's fellow linguists. **Table 6** describes the new

group of linguists we consulted with, and the questionnaire appearing at the end of this appendix

(**Appendix A ii**) shows the way the data were collected:

Table 6:   Linguists as informants in the investigation of binding in (82)–(85).

Speaker's Arabic dialect	Number	Gender	Age	Number of linguists involved
Jordanian・Palestinian・Egyptian・Saudi	1 each, totaling 4	2 females・2 males	20s - 1 30s - 2 40s - 1	4

(82) l-waladeen   tʕaawanu maʕ **l-bint₁**   ʕala taṭwiir   **nafs-ha₁**.
     the-boys.DL.NOM helped   with **the-girl**.GEN on improvement.GEN **self-her**.GEN

     'The two boys helped **the girl₁** with the improvement of **herself₁**.'

(83) a. muħaawalet ʔintiħar   eṭ-ṭaalib   el-madʒnuun
         attempt.NOM suicide.GEN   the-student.GEN the-hazed.GEN

         galabat   **zummalaaʔ fariig-uh₁**   ḍidd   **nafs-hum₁**.
         turned   mates.ACC team-his.GEN   against selves-them.GEN

         'An attempted suicide of the hazed student turned **his teammates₁** against **themselves₁**.'
         ≈ 'An attempted suicide of the hazed student made **his teammates₁** blame **themselves₁**.'

     b. eθ-θarθrah   galabat **el-dʒiiraan₁**   ḍidd   **baʕḍ-hum**   **l-baʕḍ₁**.
         the-gossip.NOM turned **the-neighbors**.ACC against some-them.GEN the-some.GE

         '**The gossip** turned the **neighbors₁** against **each other₁**.'

(84) al-filasṭinijjuun   taʕaawanu   maʕ **aṣ-ṣahjuuni₁**   ḍidd-**uh₁**.
     the-Palestinians.NOM   cooperated   with **the-Zionist**.GEN against-**him**.GEN

     'The Palestinians cooperated with **the Zionist₁** against **him**.'

(85) el-ʔustaað   tsaahal   maʕ **eṭ-ṭaalibeh₁**   ḍidd-**ha₁**.
     the-teacher.M.NOM acted-leniently with the-student.F.GEN against-her.GEN

    'The male teacher acted leniently with **the female student** against **her**.'

    ≈ 'The male teacher acted leniently toward **the female student₁**, which would not do **her₁**
      any good in the end.'

In (82), it was asked if *nafs-ha* 'herself' (= *an anaphor located in an adjunct PP*) can refer back

to the object *l-bint* 'the girl', of course without coindexation indicated. This in fact is identical to

(72a) discussed in Appendix A i.

    With (83a–b), we examined, in a similar way, if such complement-orientated anaphor

binding becomes obtainable even in the sentence structure identical to that in the reviewer's

Twitter examples when pragmatics is properly controlled. It was examined, in other words, if

both of reflexive and reciprocal anaphors can comfortably refer back to the object and yield

naturally interpreted sentences.

    In (84) and (85), it was examined if a pronoun instead of an anaphor indeed would be used

to refer back to the object in the construction similar to that in the reviewer's Twitter examples,

as the reviewer claims.

    The results are summarized in **Table 7** together with the first author's judgments. The

judgments were made on the binding interpretations indicated by the coindexation in each

example.

Table 7:   The results of the investigation of binding in (82)–(85).

	Example				
Speaker's Arabic dialect	(82)	(83a)	(83b)	(84)	(85)
Jordanian (1st author)	ok	ok	ok	*	*
Jordanian	ok	ok	ok	*	*
Palestinian	ok	ok	ok	*	*
Egyptian	ok	ok	ok	*	*
Saudi	ok	*	ok	ok	*

We believe that the results here present a rather clear trend toward the support of our judgments and claims rather than those asserted by the reviewer — predominantly, the anaphor binding in (82) and (83a-b) was permitted and the pronominal binding in (84) and (85) was prohibited.

We presented above what we believe is the faithful record of the disputes over the binding data we presented in Appendix A i. Since the main trend of the judgments provided by our informants was not necessarily shared by some speakers including some Twitter users, one reviewer, and two other linguists, we may indeed be witnessing some hitherto unnoticed variation among Arabic speakers. While we had to withdraw our binding arguments from the main part of the paper, we feel that they should be submitted to the readers together with the reviewer's objection and our extended investigations so that the readers should be able to make their own judgments on this dispute. The following is the questionnaire used in the extended investigations reported just above.

Questionnaire

Please select one or more of (i)–(iv) for each sentence below. The word forms in the sentences can be changed in accordance with the dialect you speak:

Your dialect	(82)	(83a)	(83b)	(84)	(85)

(82) l-waladeen   tʕaawanu maʕ **l-bint**   ʕala taṭwiir   **nafs-ha**.
    the-boys.DL.NOM helped   with **the-girl**.GEN on   improvement.GEN **self-her**.GEN

    'The two boys helped **the girl** with the improvement of **herself**.'

  ⇒ Can **nafs-ha** 'herself' refer to **l-bint** 'the girl'?

    (i) ___ yes   (ii) ___ no   (iii) ___ can't tell   (iv) ___ too complex sentence structure

(83) a. muħaawalet ʔintiħar   eṭ-ṭaalib   el-madʒnuun
        attempt.NOM suicide.GEN the-student.GEN the-hazed.GEN

   galabat   **zummalaaʔ** **fariig-uh**   ḍidd   **nafs-hum**.
   turned   mates.ACC   team-his.GEN   against selves-them.GEN

   'An attempted suicide of the hazed student turned his **teammates** against **themselves**.'

   ≈ 'An attempted suicide of the hazed student made his teammates blame themselves.'

   ⇒ Can **nafs-hum** 'herself' refer to **zummalaaʔ fariig-uh** 'his teammates'?

      (i) ___ yes   (ii) ___ no   (iii) ___ can't tell   (iv) ___ too complex sentence
                                                                      structure

   b. eθ-θarθrah   galabat **el-dʒiiraan**   ḍidd   **baʕḍ-hum**   **1-baʕḍ**.
      the-gossip.NOM turned   **the-neighbors**.ACC against   some-them.GEN the-some.GEN

   '**The gossip** turned the **neighbors** against **each other**.'

   ⇒ Can **baʕḍ-hum 1-baʕḍ** 'each other' refer to **el-dʒiiraan** 'the neighbors'?

      (i) ___ yes   (ii) ___ no   (iii) ___ can't tell   (iv) ___ too complex sentence structure

(84) al-filasṭinijjuun   taʕaawanu   maʕ **aṣ-ṣahjuuni**   ḍidd-**uh**.
     the-Palestinians.NOM   cooperated   with **the-Zionist**.GEN against-**him**.GEN

   'The Palestinians cooperated with the **Zionist** against **him**.'

   ⇒ Can -**uh** 'him' refer to **aṣ-ṣahjuuni** 'the Zionist'?

      (i) ___ yes   (ii) ___ no   (iii) ___ can't tell   (iv) ___ nonsense sentence

(85) el-ʔustaað   tsaahal   maʕ **eṭ-ṭaalibeh**   ḍidd-**ha**.
     the-teacher.M.NOM acted-leniently with the-student.F.GEN against-her.GEN

   'The male teacher acted leniently with **the female student** against **her**.'

   ≈ 'The male teacher acted leniently toward **the female student**, which would
      not do **her** any good in the end.'

   ⇒   Can -**ha** 'her' refer to **eṭ-ṭaalibeh** 'the student'?

      (i) ___ yes   (ii) ___ no   (iii) ___ can't tell   (iv) ___ too complex sentence structure

Appendix A iii — Resolving some potential issues on binding:

There are two potential issues that need to be addressed in relation to the binding arguments

presented in Appendix A i above. First, one may adopt Chomsky's (1986: 123, 167) "PRO in

NP" analysis and offer an alternative account to our empty anaphor approach to the "complement

orientation." Under this approach, the successful binding of the SELF-anaphor in the reciprocal

sentence (76a) will be ascribed to the presence of a subject-controlled PRO within the adjunct as

in (86) below rather than the presence of the empty anaphor in the complement position.

(86) l-waladeen$_{<1+2>}$ *t*-ʕaawanu [$_{Ajct}$ ʕala [$_{NP}$ **PRO$_{<1+2>}$** taṭwiir **nafs-hum$_{<1+2>}$**]].
      the-boys.DL.NOM **T**-helped on improvement.GEN self-them.GEN
      'The two boys helped each other with the improvement of themselves.'

There are reasons, however, not to adopt this alternative approach. First, it would make

incorrect predictions about a similar anaphor binding in one-place constructions. If a subject-

controlled PRO were postulated as in (87) below, the SELF-anaphor in the adjunct would be

incorrectly permitted. (Recall the examples in (71) above demonstrating the failure of such

binding in one-place constructions.)

(87) l-mudiir$_1$ ʕimil bi-dʒiddiyeh [$_{Ajct}$ baʕid
     the-manager.M.NOM worked in-seriousness.GEN after

[$_{NP}$ **PRO$_1$** taʃdʒiiʕ { l-muwaððafiin / ***nafs-uh$_1$** } ʕala ʃ-ʃuɣul]].
     encouragement.GEN the-employees.GEN **self-him**.GEN on the-work.GEN
     'The manager worked hard after the encouragement of { the employees / **himself** } for work.'

The same problem arises in one-place constructions involving "morphological" reflexivization as

in (88) (and also in (77b) above when it is reanalyzed with PRO$_1$ in NP).

(88) **l-walad$_1$** *t*-ʔaddab [$_{Ajct}$ baʕid [$_{NP}$ **PRO$_1$** taʔniib { ṣħaab-uh / ***nafs-uh$_1$** }].
     the-boy.NOM **T**-behaved after reprimand.GEN friends-his.GEN **self-him**.GEN
     'The boy behaved himself after the reprimand of { his friends / *himself }.'

In fact, if the "PRO in NP" approach is extended to the analysis of two-place constructions,

it will end up supporting the postulation of an empty complement anaphor in morphological

reciprocals as in (76a). Recall, first, the binding facts observed in the transitive construction

(72a) above (repeated here as (89) with the PRO in NP analysis).

(89) l-waladeen$_1$ ʕaawanu   **l-bint$_2$**
     the-boys.DL.NOM   helped   the-girl.ACC

     [$_{Ajct}$ ʕala [$_{NP}$ **PRO$_2$** taṭwiir   { *#**nafs-hum$_1$**   / ᵒᵏ**nafs-ha$_2$**   }].
           on   improvement.GEN   self-them.GEN   self-her.GEN

     'The two boys helped the girl with the improvement of { *themselves / ᵒᵏherself }.'

Crucially, the SELF-anaphor in the adjunct can be bound by the object *l-bint* 'the girl' but not by

the subject *l-waladeen* 'the boys'. If we attempt to capture this contrast by postulating PRO as in

(89), we must consider that the PRO here is controlled by the object rather than the subject,

contrary to what was assumed in (86).

     Furthermore, observe the morphologically T-marked two-place construction in (90).

(90) **l-muraahiqeen$_1$**   *t*-ʃaaraku   maʕ-**uh$_2$**   [$_{Ajct}$ b-[$_{NP}$ **PRO$_{1/2}$** taxliiṣ
     the-adolescents.M.DL.NOM **T**-joined   with-him.GEN   in   extrication.GEN

     { ᵒᵏ**ʔuxt-uh**   / *#**nafs-hum$_1$**   / ᵒᵏ**nafs-uh$_2$**   } min l-maʃaakil   ]].
        sister-his.GEN   self-them.GEN   self-him.GEN   from   the-problems.GEN

     'The two (male) adolescents joined him for the extrication of { ᵒᵏhis sister / *themselves /
     ᵒᵏhimself } from the problems.'

First, when the nominal in the adjunct is *ʔuxt-uh* 'his sister', this sentence is grammatical with

either the reading *(i)* "the adolescents$_1$ worked with him on *their$_1$ extrication* of his sister from

the problems" or *(ii)* "the adolescents worked with him$_2$ on *his$_2$ extrication* of his sister from the

problems." Therefore, if we were to capture this ambiguity with the postulation of PRO as shown

in (90), we would have to consider that it can be controlled either by the subject or by the

complement. When we replace *ʔuxt-uh* 'his sister' with SELF-anaphors in (90), however, a

contrast similar to that observed in (89) arises. That is, *nafs-hum* 'themselves' referring back to

the subject is prohibited while *nafs-uh* 'himself' referring back to the complement is permitted

despite the ambiguous control, which must be assumed to capture both of the interpretations (i)

and (ii) described just above. This indicates that we should not rely on the postulation of PRO to capture either the "complement orientation" of the anaphor binding (with *nafs-uh* 'himself') or the prohibition against its "subject orientation" (with *nafs-hum* 'themselves') observed in (90).

If, as in (91) below, we eliminate the overt complement *maʕ-uh* "with him" from (90), we are taken back to the seemingly one-place "morphological reciprocalization" parallel to (76a).

(91) l-muraahiqeen]$_{<1+2>}$ *t*-ʃaarakuu **[e]**$_{<1↔2>}$
  the-adolescents.M.DL.NOM **T**-joined

 [$_{Ajct}$ b- [$_{NP}$ taxliiṣ   **^{ok}nafs-hum**$_{<1+2>}$ min l-maʃaakil]].
   in extrication.GEN self-them.GEN from the-problems.GEN

 'The two (male) adolescents joined/worked with each other in/on the extrication of themselves from the problems.'

Unlike in (90), we get the impression that *nafs-hum* 'themselves' in (91) can be directly bound by the subject. However, this impression is likely to be delusive, first, since we cannot rely on the postulation of PRO to capture the binding facts in this construction, and second, since the SELF-anaphor in the adjunct cannot be subject-oriented. It therefore seems quite natural and reasonable to postulate the phonetically empty reciprocal anaphor in the complement position and let the SELF-anaphor be bound by it as shown in (91) to rationalize this misleading impression.

The second issue related to our binding arguments is more recalcitrant. We saw above that the reciprocal anaphor in the complement of a morphologically T-marked predicate can serve as the antecedent of a SELF-anaphor located in the adjunct phrase following it. As repeated in (92) below, we further argued that this is what happens whether the anaphor is realized overtly or covertly.

(92) l-waladeen_{<1+2>} [_{v'} *t*-ʕaawanu { maʕ **baʕḍ̣-hum** **l-baʕḍ̣**_{<1↔2>} / [e]_{<1↔2>} }]
    the-boys.DL.NOM   T-helped   with some-them.GEN the-some.GEN

[_{Ajct} ʕala taṭwiir   **nafs-hum**_{<1+2>}].   (= (75a) + (76a))
        on improvement.GEN self-them.GEN

'The two boys helped each other with the improvement of themselves.'

Here, despite the successful binding of the SELF-anaphor, it apparently is not c-commanded by its antecedent in the complement position. The situation is surely disturbing since c-command has widely been assumed to be a structural condition imposed on binding. It should be noted, however, that this is not a problem peculiar to the "morphological" reciprocal construction we have examined. The same issue arises in a regular (non-reciprocal) transitive construction as in (93) below, in which the SELF-anaphor within the adjunct must be bound by the object NP *l-bint* 'the girl' located within V', again apparently without being c-commanded.

(93) **l-waladeen₁**   [_{v'} ʕaawanu **l-bint₂**]
    the-boys.DL.NOM   helped   the-girl.ACC

[_{Ajct} ʕala taṭwiir   { *__**nafs-hum₁**__ / ^{ok}**nafs-ha₂** }] .
        on improvement.GEN self-them.GEN   self-her.GEN

'The two boys helped the girl with the improvement of { *themselves / ^{ok}herself }.'

In fact, similar cases involving "binding without c-command" have been widely reported on English. Some cases involve anaphor binding, as in (94) below, and some other cases involve pronominal binding by quantified antecedents, as in (95).

(94) a. God [gave **the lovers**_{<1+2>}] peace in **each other**'s_{<1↔2>} arms.

b. I talked [_{PP} with **the neighbors**_{<1+2>}] about **each other**_{<1↔2>}.

(Reinhart 1983: 132, 176–7; see also Pollard & Sag 1992, Varaschin 2020)

(95) a. Our staff keeps a watchful eye [on **every situation₁**] and on **its₁** developments.

b. [A friend of **each contestant₁**] stood behind **her₁**.   (Barker 2012: 621, 623)

When the antecedent is a possessor within a nominal phrase, further complications arise. First, apparently, a contrast arises between the binding of reflexives and reciprocals:

(96) a. *[**Siegfried$_1$'s** mother] adores **himself$_1$**. (Reinhart 1983: 178)

    b. [**The men's$_{<1+2>}$** books] viciously attacked **each other$_{<1\leftrightarrow2>}$**. (Hornstein 2001: 219)

Second, anaphors and pronouns are reported to behave differently when they are to be bound by a quantified antecedent as a possessor:

(97) a. [**Everyone$_1$'s** father] thinks **he$_1$**'s a genius. (Higginbotham 1980: 691)

    b. *[**Every girl$_1$'s** father] admires **herself$_1$**. (Kayne 1994: 25)

    As Barker (2012) summarizes in his overview of the cases involving quantificational binding, the accounts of the puzzles proposed in the literature are quite varied. Some try to adjust syntactic structures or appeal to a mechanism different from binding in order to maintain the validity of the c-command requirement,[32] while others try to redefine the notion c-command or simply reject it as a requirement on binding. Unfortunately, pursuit of the solution goes beyond the scope of this work and we must leave it to the future research of ourselves as well as others.

Appendix B — Possible cross-linguistic investigations of Arabic and English:

When we overview our core observations of the JA data and compare them with those of their English counterparts, a grain of an interesting cross-linguistic picture emerges. Although its full-scale pursuit must await future research, we would like to briefly summarize our preliminary sketch of this future topic in this appendix.

    Let us begin with the comparison of the JA sentences in the paradigm (98)–(100).

(98) z-zalameh$_1$ w-marat-uh$_2$ *baawasu*/*ʕaawanu*   **baʕḍ-hum**   **l-baʕḍ$_{<1\leftrightarrow2>}$**.
    the-man.NOM and-wife-his.NOM kissed   helped   some-them.ACC the-some.ACC

    { ^{ok}b-laħḍet   bidaajet   raas   es-saneh   / ^{ok}bi-t-tanaawub }.
      in-moment.GEN beginning.GEN head.GEN the-year.GEN   in-the-turn.GEN

    'The man and his wife kissed/helped each other { ^{ok}at the moment the new year began / ^{ok}in turn }.'

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[32] One may, for example, appeal to the movement of either or both of the anaphor and its antecedent to the periphery of various functional projections over traditional phrases like NP, VP and even PP.

(99) *z-zalameh$_1$ w-marat-uh$_2$ *baawasu*/ʕaawanu   **[e]RECIP<1↔2>**.
    the-man.NOM and-wife-his.NOM kissed   helped

   Intended: 'The man and his wife kissed/helped (each other).'

(100) z-zalameh$_1$ w-marat-uh$_2$ *t*-baawasu / *t*-ʕaawanu
    the-man.NOM   and-wife-his.NOM **T**-kissed   **T**-helped

   { maʕ baʕð̣-hum   1-baʕð̣<1↔2>   / **[e]RECIP<1↔2>** } (#bi-t-tanaawub).
     with some-them.GEN   the-some.GEN   in-the-turn.GEN

   'The man and his wife kissed/helped each other (#in turn).'

First, we have observed earlier that when an overt reciprocal anaphor accompanies a *non-T-marked* predicate (F3) as in (98), the sentence is compatible with either a collective or distributive adjunct. On the other hand, when an overt anaphor is eliminated from the same sentence as in (99), we now see that it not only disallows the reciprocal interpretation but also makes the sentence *ungrammatical*. However, as we have also observed earlier, the same predicates permit an empty anaphor [e]RECIP when they are morphologically T-marked as in (100), which exhibits *obligatory collectivity* and rejects a distributive adjunct.

If the analyses argued for in the present work are correct, this amounts to the observation that an empty anaphor [e]RECIP in JA can be licensed *only when the collective T-morpheme is present* in the sentence. Note also that this observation holds for both *baawasu* 'kissed' and *ʕaawanu* 'helped', that is, whether the predicate is the so-called "symmetrical" predicate (which involves lexically induced simultaneity) or "asymmetrical" predicate.

With these observations of JA in mind, let us now turn to similar examples in English as in (101) and (102).

(101)   a. They<1+2> *kissed/hugged* **each other<1↔2>**.
        b. They<1+2> *kissed/hugged* _____<1↔2>.

(102)   a. They<1+2> *helped* **each other<1↔2>**.
        b. They<1+2> *helped* _____*<1↔2>.

Recall first that, as shown in (101a–b), when "symmetrical" verbs like *kiss*/*hug* are involved, a reciprocal interpretation is available *with or without* the presence of an overt anaphor *each other*. On the other hand, as Carlson (1998: 43) observed, a reciprocal interpretation is not available when the sentence involves an "*asymmetrical*" verb like *help* but lacks the overt anaphor *each other*, as in (102b).

Second, let us also elaborate on Link's (1998: 49) original observation and demonstrate that the *absence* of an overt reciprocal anaphor *each other* prohibits a distributive interpretation and requires a collective interpretation of reciprocality even with "symmetrical" verbs as in (101b). This point can be illustrated by the interpretive contrast between (101a) and (101b) as follows. First, all sentences in (101) are grammatical and they are all equally compatible with the adjunct which would prompt *collective reciprocality* in these sentences, for example with "the moment the clock struck 12 midnight."

The contrast in question shows up, however, between (101a) (with an overt reciprocal anaphor) and (101b) (without it) in the distinct availability of *distributive reciprocality* if such a reading is enforced by a distributive adjunct. If, for instance, the adjunct "in turn" shows up in (101a), it permits the interpretation "John kissed/hugged Mary first, and then Mary kissed/hugged John." "In turn" showing up in (101b), on the other hand, prohibits such distributive reciprocality but enforces the interpretation "John kissed/hugged someone/something first, and then Mary kissed/hugged (most likely the same) someone/something," which *does not involve reciprocality*. In short, reciprocality can be achieved either distributively or collectively when an overt reciprocal anaphor is involved as in (101a). On the other hand, reciprocality can be achieved only *collectively* in the same sentence if an overt anaphor is missing, as in (101b). The observation crucial to us here is that *collectivity comes to be imposed obligatorily on a*

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reciprocal sentence only when an overt reciprocal anaphor is missing. To the best of our knowledge, Carlson's observation on (102b) and Link's observations on (101b) have remained unrelated to this date.

Moreover, let us point out that the observations of Arabic ((98)–(100)) and those of English ((101)–(102)) just presented are intertwined in a puzzling way, as schematically illustrated here:

(103) <u>Arabic (JA: Translated into English)</u>:

      (98a')   They$_{<1+2>}$ *kissed* **each other** (^{ok}in turn).   ($\approx$ (101a') below)

      (98b') They$_{<1+2>}$ *helped* **each other** (^{ok}in turn).   ($\approx$ (102a') below)

      (99a') *They$_{<1+2>}$ *kissed* **[e]**$_{RECIP<1\leftrightarrow2>}$.   ($\neq$ (101b') below)

      (99b') *They$_{<1+2>}$ *helped* **[e]**$_{RECIP<1\leftrightarrow2>}$.   ($\approx$ (102b') below)

      (100a')   They$_{<1+2>}$ *t-kissed* **[e]**$_{RECIP<1\leftrightarrow2>}$ ($^{\#}$in turn).   ($\approx$ (101b') below)

      (100b')   They$_{<1+2>}$ *t-helped* **[e]**$_{RECIP<1\leftrightarrow2>}$ ($^{\#}$in turn).   ($\neq$ (102b') below)

(104) <u>English</u>:

      (101a')   They$_{<1+2>}$ *kissed* **each other**$_{<1\leftrightarrow2>}$ (^{ok}in turn). ($\approx$ (98'a) above)

      (101b')   They$_{<1+2>}$ *kissed* _____$_{<1\leftrightarrow2>}$ ($^{\#}$in turn). ($\approx$ (100'a)) but ($\neq$ (99'a) above)

      (102a')   They$_{<1+2>}$ *helped* **each other**$_{<1\leftrightarrow2>}$ (^{ok}in turn). ($\approx$ (98'b) above)

      (102b')   They$_{<1+2>}$ *helped* _____*$_{<1\leftrightarrow2>}$. ($\neq$ (100'b)) but ($\approx$ (99'b) above)

The two languages are quite parallel when an overt reciprocal anaphor appears in the sentences ((98a–b') $\approx$ (101a')/(102a')). They are, however, both similar and distinct in intriguing ways when an overt reciprocal anaphor *does not* show up. First, rather unexpectedly, the English symmetrical verb *kiss* in (101b') behaves parallelly to the Arabic *t-marked kiss* in (100a'), while it contrasts with the Arabic "plain" *kiss* in (99'a). When it comes to the "plain" asymmetrical verb *help*, on the other hand, it behaves parallelly in the English sentence (102b') and the Arabic sentence (99'b), both disallowing a reciprocal interpretation.

This enigma, however, can be untangled if our analyses of JA turn out to be correct and reflect more extensive crosslinguistic generalizations as follows. Suppose that a collective

morpheme is not a language particular entity, but it exists more widely in natural languages with its core properties as summarized in (105).[33]

(105) a. "$\mu_{\text{COLL}} \rightarrow$ obligatory collectivity":
       A collective bound morpheme (henceforth, μ_{COLL}) indicates *significant overlap of subeventualities* expressed by a sentence, i.e., *obligatory collectivity* involved there.

    b. "$\mu_{\text{COLL}} \rightarrow V_{\text{plural eventuality}}$":
       μ_{COLL} is licensed by an input verb that can yield a *plural eventuality*.

    c. "$[\text{ e }]_{\text{RECIP}} \rightarrow \mu_{\text{COLL}}$":
       μ_{COLL} must appear in a sentence in order for an empty reciprocal anaphor $[\text{ e }]_{\text{RECIP}}$ to be licensed.

A variety of facts we observed in JA above can be ascribed to these properties of μ_{COLL}, which is t_{COLL}- in case of JA. (105a) accounts for the obligatory collectivity in (100a–b') (contrary to (98a–b')). (105b) prescribes that F6 be derived from F3 and collective F8 be derived from "symmetrical" F1. (105c) induces the ungrammaticality of (99a–b') (contrary to (100a–b')).

Furthermore, let us now explore the possibility that a certain amount of variation is permitted for the realization of a collective morpheme (μ_{COLL}) in different languages. First, let us assume that the morphological realization of μ_{COLL} is cross-linguistically varied, including the possibility that it may be realized as a *phonetically empty* collective morpheme $\emptyset_{\text{COLL}}$. Second, we assume that the exact semantic property of a predicate that licenses μ_{COLL} as in (105b) may vary in different languages within a reasonable range. Such cross-linguistic variations in the grammar concerning morpho-lexical matters are quite often observed and not out of the question, we believe. When we adopt this general view of collective morphemes

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[33] Collective morphemes have been verified noticeably often in Oceanic languages (Dench 1995; Dixon 1988, among others). The reciprocal suffix *-aw* in Japanese also seems to exhibit obligatory collectivity together with reciprocality, sometimes involving parallel eventualities.

Pursuing such crosslinguistic generalizations, let us suppose now that a collective morpheme μ_{COLL} exists not only in Arabic but also in English, the crucial difference between the two languages being that it is morphologically realized as t_{COLL}- in JA but as the phonetically empty $-\varnothing_{COLL}$ in English. This analysis will allow us to reanalyze (101b') above as in (106) below, assimilating it to the Arabic F6 as in (100'a).

(106)   They$_{<1+2>}$ *kissed*-$\varnothing$**COLL [e]**$_{RECIP<1\leftrightarrow2>}$ ($^\#$in turn).   (= (101b'))

Then we can immediately explain why a reciprocal interpretation is available even without the presence of the overt anaphor *each other* in (101b'). Because of the appearance of $-\varnothing_{COLL}$, an empty reciprocal anaphor [e]$_{RECIP}$ may be introduced in accordance with (105c). Even more importantly, we can also explain why collectivity suddenly becomes obligatory when the overt reciprocal anaphor is eliminated (= Link's observation). The presence of $-\varnothing_{COLL}$ (interacting with the operator *Coll*) imposes obligatory collectivity in (101b') in accordance with (105a).

Why is a reciprocal interpretation not available in (102b') in English, in which *each other* is missing, contrary to (101b') (= Carlson's observation)? Obviously, the analysis as in (107) below is not available for this case, contrary to (106) above.

(107)   *They$_{<1+2>}$ *helped*-$\varnothing$**COLL [e]**$_{RECIP<1\leftrightarrow2>}$.

We consider that this contrast arises because of the licensing property of $-\varnothing_{COLL}$ in English such that it must be affixed to a "symmetrical" verb ("μ**COLL** $\rightarrow$ V$_{symmetric}$"). This permits the representation as in (106) but not that in (107). This may appear to be an arbitrary deviation from the general licensing characterization of μ_{COLL} stated in (105b). When we note that symmetrical eventualities in fact make up a subset of plural eventualities, as illustrated in **Figure 1**, we can say that the licensing property of μ_{COLL} in English ($-\varnothing_{COLL}$) is only somewhat more narrowly specified than that for general cases.

plural eventualities
symmetrical eventualities
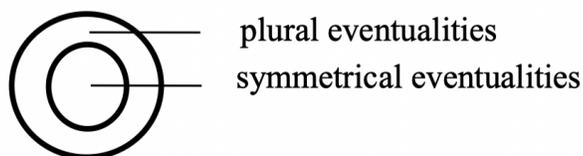
Figure 1: Symmetrical eventualities as a subset of plural eventualities.

From this variation, it follows that "symmetrical" verbs and "asymmetrical verbs" behave differently in English ((101b') vs. (102b')) while they do not in JA ((100'a) ≈ (100'b)).

  Table 8 depicts the variations of the collective morpheme μ_{COLL} between JA and English.

Table 8: Collective morpheme μ_{COLL} — JA vs. English.

	JA	English
μ_{COLL}	t_{COLL}- (no $\varnothing_{COLL}$-)	-$\varnothing_{COLL}$
Licensing property in the input verb	plural eventuality	*symmetrical* plural eventuality

Note especially that JA does not have an empty μ_{COLL} ($\varnothing_{COLL}$-). This means that an empty reciprocal anaphor [e]$_{RECIP}$ is not permitted with *non-T-marked* verbs, as shown in (99'a–b). The sentence therefore fails to make up a two-place construction, whether the verb is symmetrical (*baawasu* 'kissed') or asymmetrical (*ʕaawanu* 'helped'), and becomes ungrammatical. To the contrary, *T-marking* and therefore [e]$_{RECIP}$ as well, is permitted for either type of verbs inducing a plural eventuality, as shown in (100'a–b). This also makes a contrast with the English pair (101b') and (102b'), in which -$\varnothing_{COLL}$ and hence [e]$_{RECIP}$ can be licensed only by the *symmetrical* verbs like *kiss* and *hug*.[34]

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[34] In Appendix A i, we appealed to a binding test to demonstrate the presence of [e]$_{RECIP}$ in the **T**-marked reciprocals in JA (see (76)). We have noted, however, that the same test, unfortunately, will not be credible in the attempt to detect [e]$_{RECIP}$ in a sentence like (106) in English. Given that a reflexive anaphor in the adjunct in (ia) below can be bound either by the subject or the complement, the successful binding of the anaphor in (ib) does not

To sum up, it was argued in this appendix that otherwise puzzling similarity and discrepancy observed between JA and English reciprocal constructions would be rationalized if we analyze them in perspective of general collective morphemes ((105)) and their cross-linguistic variations (**Table 8**). This analysis allows us to capture the enigmatic contrast between Arabic and English described just below (104). The English symmetrical verb *kiss* in (101b') is accompanied by a phonetically empty collective morpheme $-\varnothing_{COLL}$ and licenses [e]$_{RECIP}$:

(101b') English: They$_{<1+2>}$ *kissed*-$\varnothing$**COLL** [e]$_{RECIP<1\leftrightarrow2>}$ ($^{\#}$in turn).

It therefore behaves on a par with the Arabic *t-marked kiss* in (100a'):

(100a') Arabic: They$_{<1+2>}$ *t-kissed* [e]$_{RECIP<1\leftrightarrow2>}$ ($^{\#}$in turn).

The "plain" *kiss* in (99a'), on the other hand, is disallowed in Arabic because of the lack of $\varnothing_{COLL}$- in this language, contrary to (101b') in English, which can involve $-\varnothing_{COLL}$ as in (106):

(99a')   Arabic: ***They$_{<1+2>}$** *kissed* **[e]$_{RECIP<1\leftrightarrow2>}$**.

Both (99b') and (102b') are disallowed but for distinct reasons.

(99b')   Arabic: ***They$_{<1+2>}$** *helped* **[e]$_{RECIP<1\leftrightarrow2>}$**.
(102b')   English: They$_{<1+2>}$ **helped** _____*$_{<1\leftrightarrow2>}$.

The "plain" *help* in (99b') is disallowed in Arabic again because of the lack of $\varnothing_{COLL}$-, while it is disallowed in (102b') in English because $-\varnothing_{COLL}$ cannot be licensed by an *asymmetrical* verb, and hence [e]$_{RECIP}$ cannot be licensed in this language.

Once again, this has been just a quick and tentative sketch, but it may open up a possibility of cross-linguistic surveys on reciprocality which can be pursued on a much larger scale in the

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necessarily advocate the presence of [e]$_{RECIP}$ as a complement.

(i)   a.   [***Trump and Putin***]$_1$ met with ***Pope Francis***$_2$ [$_{Ajct}$ purely on behalf of { **himself**$_2$ / **themselves**$_1$ }].
         b.   Trump$_1$ and Putin$_2$ met _____ [$_{Ajct}$ purely on behalf of **themselves**$_{<1+2>}$].

future.

Appendix C — T-morphemes in various Arabic dialects — An initial investigation:

This appendix reports the results of our cursory investigation of cross-dialectal variations in Arabic. We conducted three different types of grammaticality judgement tests with one each native speaker of Saudi, Kuwaiti, Egyptian, and Palestinian dialects, in addition to our JA informants. The investigations here were all prompted by the comments made by another anonymous reviewer on various interpretations of reciprocal sentences in languages/dialects other than JA. **Table 9** describes the informants we consulted with.

Table 9:   Informants in the investigation of various Arabic dialects.

Speaker	Number	Gender	Age	Number of linguists involved
Jordanian	5	2 females · 3 males	20s - 1 30s - 3 50s - 1	1
Saudi · Palestinian · Kuwaiti · Egyptian	1 each, totaling 4	3 females · 1 male	30s - 4	2

Appendix C i — Distributivity with T-morphemes:

We first examined if distributive interpretations (i.e., non-overlapping subeventualities) are incompatible with T-marked verbs in other dialects just as in JA. We presented the sentences as in (108)–(110) below (in each respective dialect of Arabic) with two potentially compatible circumstances describing those sentences — one illustrates a collective situation (as in *a*) and the other illustrates a distributive situation (as in *b*). We then asked the speakers to pick the circumstances that are compatible with the provided sentence (and later to let us know if the unselected circumstances were just dispreferred or incompatible).

(108) Bader₁   w-ʕumar₂   *t-saabagu* maʕ baʕð-hum   l-baʕð₍₁↔₂₎.
      Bader.NOM and-Omar.NOM T-raced   with some-them.GEN the-some.GEN
      'Bader and Omar raced with each other.'

Possible circumstances:

a. **Collective**:

t-saabagu   b-wagt   waaħad.
T-raced.3P.PL   in-time   one

'They raced on a single occasion.'

b. **Distributive**:

Bader *rakaḍ* masaafit kiloh   b-ʕaʃar   dagaajeg   w-baʕdha
Bader ran   distance kilometer in-ten   minutes   and-after

b-ʃwajj ʕumar *rakaḍ* nafs el-masaafih b-rubuʕ   saaʕah.
in-little Omar   ran   same the-distance   in-quarter hour

'Bader ran one kilometer in ten minutes and after a little bit Omar ran the same distance in a quarter of an hour.'

(109) et-taadʒreen$_{<1+2>}$ *t-faaṣalau* maʕ baʕð-hum   l-baʕð$_{<1↔2>}$.
the-businessmen.DL.NOM   **T**-haggled with some-them.GEN the-some.GEN

'The two businessmen haggled (negotiated prices) with each other.'

Possible circumstances:

a. **Collective**:

t-faaṣalau   ʕala ʔasʕaar eθ-θalaadʒeh   wi-s-sajjaarah   b-wagt   waaħad.
T-haggled.3P.PL on   prices the-fridge   and-the-car   in-time   one

'They haggled on the prices of the fridge and the car on a single occasion.'

b. **Distributive**:

el-ʔawwal *faaṣal* eθ-θaani ʕala   siʕir el-mazharijjeh
the-first   haggled the-second on   price the-vase

b-suug   el-dʒumʕah el-ʔusbuuʕ el-maaði bas eθ-θaani   *faaṣal*
in-market the-Friday   the-week   the-last   but the-second haggled

el-ʔawwal ʕala siʕir   el-lawħah   b-suug   el-dʒumʕah haað el-ʔusbuuʕ.
the-first   on   price the-painting in-market the-Friday   this   the-week

'The first businessman haggled with the second businessman on the price of a vase in the last week's Friday market, but the second one haggled with the first on the price of a painting in this week's Friday market.'

(110) el-ʔaxu$_1$ w-ʔuxt-uh$_2$ *t-ʕaawanu* maʕ baʕð-hum   l-baʕð$_{<1↔2>}$.
the-brother.NOM and-sister-his.NOM **T**-helped   with some-them.GEN the-some.GEN

'The brother and his sister helped each other.'

Possible circumstances:

a. **Collective**:

t-ʕaawanu   ʕala ʃuɣl el-beet   b-wagt waaħad.
T-helped.3P.PL on   work the-house in-time one
'They helped each other with the housework at the same time.'

b. **Distributive**:

el-ʔaxu   *ʔaʕṭa* ʔuxt-uh maṣaari es-saneh el-maaðjeh
the-brother gave sister-his money   the-year the-last

w-hiih *wigfat*   maʕaa-h lamma daxal   el-mustaʃfa   haaj es-saneh.
and-she supported with-him when entered the-hospital this the-year
'The brother gave his sister money last year and she supported him when he was
  hospitalized this year.'

All of the Jordanian, Saudi, Kuwaiti, Egyptian informants unanimously picked the collective

circumstances and rejected the distributive circumstances in all of (108)–(110). That is, the

reciprocal subeventualities involved in these sentences had to be interpreted as taking place only

on a single occasion. The only variation we found was that the Palestinian speaker found (109)

and (110) to be ambiguously interpretable while s/he agreed with the other speakers concerning

(108) and found it to be strictly collective.

    We also conducted the same test with (111) below, which an anonymous reviewer claims to

permit distributivity (as described in *b*) in addition to collectivity (as described in *a*)

(111) eljoom   *t-ʕaanagna*   ʔana w-ʔaxuu-j   la-ʔawwal   marrah.
    today.ACC T-hugged   I.NOM and-brother-my.NOM for-first.GEN time.GEN
    'Today my brother and I hugged for the first time.'

Possible circumstances:

a. **Collective**:

ʔana$_1$ w-ʔaxuu-j$_2$ *t-ʕaanagna* maʕ baʕð̣-na   l-baʕð̣$_{<1↔2>}$.
I   and-brother-my T-hugged   with some-us   the-some
'My brother and I hugged each other.'

b. **(Allegedly) Distributive**:

ʔana w-ʔaxuu-j   kul waaħad fii-na *t-ʕaanag* maʕ ṣaaħb-uh.
I   and-brother-my each one   of-us T-hugged with friend-his
'My brother and I each hugged respective friends.'

Although we did not think that the alleged "distributivity" as described in (111b) is equivalent to the distributivity we defined in terms of the lack of subeventuality-overlap, we had this sentence examined anyway together with (108)–(110). Then the speakers of all dialects rejected the (alleged) distributive interpretation as in (111b). Two of the informants even described this interpretation illogical (without our asking them to provide such a comment). **Table 10** summarizes all these results, whose clear trend alludes to the possibility that the T-morpheme requires collectivity not just in JA but in a fair number of dialects in Arabic.

Table 10: Summary of the investigation of distributive interpretations (various Arabic dialects).

	Jordanian	Saudi	Kuwaiti	Egyptian	Palestinian
(108)	$^{\text{ok}}a$ / $^{\#}b$	$^{\text{ok}}a$ / $^{\#}b$	$^{\text{ok}}a$ / $^{\#}b$	$^{\text{ok}}a$ / $^{\#}b$	$^{\text{ok}}a$ / $^{\#}b$
(109)	$^{\text{ok}}a$ / $^{\#}b$	$^{\text{ok}}a$ / $^{\#}b$	$^{\text{ok}}a$ / $^{\#}b$	$^{\text{ok}}a$ / $^{\#}b$	$^{\text{ok}}a$ / $^{\text{ok}}b$
(110)	$^{\text{ok}}a$ / $^{\#}b$	$^{\text{ok}}a$ / $^{\#}b$	$^{\text{ok}}a$ / $^{\#}b$	$^{\text{ok}}a$ / $^{\#}b$	$^{\text{ok}}a$ / $^{\text{ok}}b$
(111)	$^{\text{ok}}a$ / $^{\#}b$	$^{\text{ok}}a$ / $^{\#}b$	$^{\text{ok}}a$ / $^{\#}b$	$^{\text{ok}}a$ / $^{\#}b$	$^{\text{ok}}a$ / $^{\#}b$

Appendix C ii — Distributivity in non-symmetrical reciprocals:

One may consider that "non-symmetrical reciprocals" as in (112) must always involve collective reciprocality and never permits distributivity.

(112)   a.   The students followed *each other* into the room.
       b.   The kids were chasing *each other* in the playground.

We believe, however, and our English-speaking informants agree, that non-symmetrical reciprocality can in fact hold involving *non-overlapping eventualities*. We must, though, manage to imagine some specific and fitting pragmatic contexts for such readings. The need for such extra endeavors perhaps turn distributive readings into non-default and possibly dispreferred interpretations in some cases. Some of such examples are:

(113)   a.   The prisoners were so afraid of tipping-off and suspicious of other prisoners that they followed *each other* whenever someone headed toward the prison guards' office.

b. The top skiers are chasing *each other*'s records every time a competition is held.

We also examined how non-T-marked and T-marked verbs compare when they appear in non-symmetrical reciprocals in Jordanian, Saudi, Kuwaiti, and Palestinian dialects of Arabic although very few verbs seem to allow this construction in Arabic.[35] In all these dialects, the sentence involving a non-T-marked verb as in (114) below is compatible with either collective or distributive subeventualities as illustrated in *a* and *b*, respectively.

(114) eṭ-ṭulaab$_{1+2}$ *tabaʕu*   baʕð-hum   l-baʕð$_{<1\leftrightarrow2>}$.
      the-students.NOM followed some-them.ACC   the-some.ACC
      'The students followed each other.'

    a. **Collective**:

      … lamma el-ʔustaað ṣarax ʕalee-hum w-gallil-hum ʔiṭlaʕu ʕala eṣ-ṣaṭiħ
      … when the-teacher yelled at-them   and-told-them go.up on   the-roof
      fawran   la-tfillu   min   tsoonaami.
      immediately to-escape from tsunami

      '… when the teacher yelled at them and told them to go up to the roof immediately to escape the tsunami.'

    b. **Distributive**:

      … lamma ṭaalib ʕimil   blug   el-xariif el-maaði w-ṭ-ṭulaab
      … when student opened blog   the-fall the-last   and-the-students

      eθ-θaanjiin ʕimlu   bluggaat zajj-uh   waaħad wara   eθ-θaani.
      the-other   opened blogs   like-him one   after the-other

      '… when one student opened a blog account last fall and the others followed him by creating accounts one after the other.'

On the other hand, all speakers unanimously informed us that the T-marked verb in (115) below is compatible with the collective interpretation as in (114a) but not with the distributive interpretation as in (114b).

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[35] Our informant of Egyptian Arabic told us that such a test cannot be conducted because this dialect uses two distinct morphologically unmarked verbs to express both meanings/sentences.

(115) eṭ-ṭulaab$_{1+2}$ *t-taabaʕu*   wara   { baʕð-hum   l-baʕð$_{<1↔2>}$ / [**e**]**RECIP**$_{<1↔2>}$ }.
the-students.NOM **T**-followed behind   some-them.GEN the-some.GEN

'The students followed each other.'

In short, the results of this test involving "non-symmetrical reciprocals" also alludes to the

possibility that the T-morpheme requires collectivity not just in JA but in a fair number of other

Arabic dialects.

Appendix C iii — Discontinuous reciprocality:

Finally, we also conducted a test to examine if various dialects of Arabic allow or disallow

"discontinuous reciprocality" between the subject and the (comitative) complement. Just as we

did in Section 2.2, we asked the informants whether or not a sentence negating reciprocality may

follow such a "discontinuously reciprocal" sentence and make up a felicitous discourse, as in

(116)–(119).

(116) el-walad   *t-ʕaawan* maʕ ʔuxt-uh,   [w-*laakin* ʔuxt-uh
the-boy.NOM **T**-helped with sister-his.GEN,   and-but   sister-his.NOM

maa   *t-ʕaawanat*   maʕ-uh].
NEG   **T**-helped   with-him.GEN

'The boy helped his sister, [**but** his sister did **not** help him].'

(117) el-walad   *t-saamaħ* maʕ ʔuxt-uh,   [w-**laakin** ʔuxt-uh
the-boy.NOM **T**-forgave with sister-his.GEN,   and-but   sister-his.NOM

maa *t-saamaħat*   maʕ-uh].
NEG **T**-forgave   with-him.GEN

'The boy forgave his sister, [**but** his sister did **not** forgive him].'

(118) el-walad   *t-saabag* maʕ ʔuxt-uh,   [w-**laakin** ʔuxt-uh
the-boy.NOM **T**-raced   with sister-his.GEN,   and-but   sister-his.NOM

maa *t-saabagat*   maʕ-uh].
NEG **T**-raced   with-him.GEN

'The boy raced with his sister, [**but** his sister did **not** race with him].'

(119) Bader   *t-baaraz* maʕ Zeed,   **[** w-**laakin** Zeed
Bader.NOM **T**-fenced with Zeed.GEN,   and-but   Zeed.NOM

maa *t-baaraz* maʕ Bader **]**.
NEG **T**-fenced with Bader.GEN

'Bader fenced with Zeed, **[but** Zeed did **not** fence with Bader **]**.'

The results are summarized in **Table 11**, where the infelicity of the discourse (indicated by #)

suggests the involvement of a "discontinuous reciprocal" interpretation in the first sentence while

the felicity of the discourse (indicated by ok) suggests its absence.

Table 11: Summary of the investigation of discontinuous reciprocality (various Arabic dialects).

	Jordanian	Saudi	Kuwaiti	Egyptian	Palestinian	Verb	Verb type
(116)	ok	ok	ok	#	ok	*help*	Non-symmetrical
(117)	ok	ok	ok	#	ok	*forgive*	
(118)	#	ok	ok	#	#	*race*	Symmetrical
(119)	#	ok	ok	#	#	*fence*	

First, the speakers of all but Egyptian dialect rejected the "discontinuous reciprocal"

interpretation of (116) and (117), which involve a non-symmetrical predicate. This may indicate

that the T-morpheme does not induce reciprocality in any of these dialects except for the

Egyptian dialect. Second, the speakers of all but Saudi and Kuwaiti dialects assigned the

"discontinuous reciprocal" interpretation to (118) and (119), which involve a symmetrical

predicate. In our post-hoc consultations, we obtained quite illuminating and intriguing comments

from the Saudi and Kuwaiti speakers in regard to their judgments. They both informed us that

they accepted (118) and (119), that is, they rejected the "discontinuous reciprocality" in these

sentences based upon the interpretations such that *the brother* did but *the sister* did not intend to

compete with the sibling in (118), and in (119), Bader fenced in his discretion but Zeed did not

fence back, just defending himself from Bader's thrusts. They also reported that (116) and (117)

are more clearly acceptable than (118) and (119). One possible interpretation of all the

observations in **Table 11** then will be that in Jordanian, Saudi, Kuwaiti and Palestinian dialects,

the reciprocal interpretation becomes available only when the involved verb inherently induces

simultaneity independently of the use of the T-morpheme, although in the Egyptian dialect, the T-

morpheme indeed seems to induce a reciprocal interpretation.

To sum up, the results of all three cross-dialectal investigations allude to the possibility that

the function of the T-morpheme as a collectivizer rather than a reciprocalizer in JA can also be

observed in a fair number of other Arabic dialects. Given that these investigations were

conducted only in a small scale, however, we should not draw any firm conclusions at this point

but await further investigations.

Appendix D — Interaction of collectivity and reciprocality:

Recall that, in Section 3, we proposed to capture the semantics of collectivity postulating the two

operators *Coll* and *Dist* as in (120)–(121) below, which show up in a sentence as in (122).

(120)　$[\![$ *Dist* $]\!]^g = \lambda P_{<e, \varepsilon t>} \lambda Z \lambda \mathbf{e}. \forall x \sqsubseteq_A Z, P(x)(\mathbf{e})$　(= (33b))

(121) a.　$[\![$ *Coll* Spatiotemporal $]\!]^g = \lambda P \lambda Z \lambda e [P(e)(Z) \& \forall e_1, e_2 \leq e$
$[[\exists y P(e_1)(y) \& \exists x P(e_2)(x)] \rightarrow \mathbf{K(e_1)} \circ \mathbf{K(e_2)}]]$

　　 b.　$[\![$ *Coll* Temporal $]\!]^g = \lambda P \lambda Z \lambda e [P(e)(Z) \& \forall e_1, e_2 \leq e$
$[[\exists y P(e_1)(y) \& \exists x P(e_2)(x)] \rightarrow \mathbf{\tau(e_1)} \circ \mathbf{\tau(e_2)}]]$　　　(= (32a-b))

(122) [TP Sbj₁ [CollP (***Coll***) [DistP (***Dist***) [VP t₁ V Complement]]]]　　　(= (34))

In this appendix, we will attempt to figure out how the semantic interpretation is derived when

collectivity is combined with (strong) reciprocality in a JA sentence. In doing so, we will appeal

to some specific semantic analysis of reciprocality available in the literature which can be

naturally couched in the semantic model for the collectivity we have adopted above, although we

do not have any intention to make a strong commitment to it.

Presumably, when the overt distributive quantifier like *each* shows up in the sentence, *Dist*

must also appear so that they can be associated with each other in one way or another for proper interpretation, as illustrated in (123) for English and JA.

(123) a. John and Mary ***Dist*** __each__ sang a song.

  b. Zeed   w-Bader   ***Dist*** **kul**   **waaħad** ɣanna ʔuɣnijeh.
     Zeed.NOM and-Bader.NOM DIST each.NOM one.GEN sang song.ACC

   'Zeed and Bader each sang a song.'

We assume that the same situation arises when a reciprocal anaphor appears as in (124a–b).

(124) a. John and Mary ***Dist*** love ***each*** other.

  b. l-waladeen<1+2> ***Dist*** ʕaawanu ***baʕḍ-hum***   l-baʕð<1↔2>.
     the-boys.DL.NOM DIST helped   some-them.ACC the-some.ACC

   'The two boys helped each other.'

A reciprocal anaphor, however, not only demands a plural antecedent and $[\![\textit{Dist}]\!]^g (\alpha)$ but also induces reciprocality (or disjointness) (Heim & Lasnik & May 1991). Büring (2005: 206) proposes to capture such dual properties of a reciprocal anaphor appealing to its semantic characterization in (125a) below, in which the letters r (= range) and c (= contrast) represent the two indices on *each other*.

(125) a. $[\![\textit{each other}_{r, c}]\!]^g =$ the $x \sqsubseteq_A g(r)$ s.t. $x \neq g(c)$

   b. $[\![\textit{baʕḍ-hum l-baʕð}_{r, c}]\!]^g =$ the $x \sqsubseteq_A g(r)$ s.t. $x \neq g(c)$

   c. $[\![\textit{[e]}_{r, c}]\!]^g =$ the $x \sqsubseteq_A g(r)$ s.t. $x \neq g(c)$

When a reciprocal anaphor appears in sentences like (124a–b), it comes to denote, first, the individual sum of its antecedent (indicated by the range $g(r)$). Second, under the auspices of *Dist* in (122), *each*/*baʕḍ-hum* marks the presence of the atomic individuals of this range, which also identifies contrasts (indicated by $g(c)$). Finally, each of such contrasts and any atomic individual (x) within the same range are prescribed to play a role in the involved plural eventuality in a

disjoint (i.e., non-reflexive) manner ($x \neq g(c)$).[36] Once (125a) is adopted, it is not out of the

question to consider that exactly the same analyses can be extended to the reciprocal anaphor

baʕḍ-hum l-baʕð 'each other' in JA and even to the feature bundles involved in its covert

counterpart as in (125b–c).

While we leave open whether and how exactly reciprocal anaphors should be decomposed

and analyzed, we consider that *Dist* and an overt distributive element like *each* should be

associated with each other in one way or another. Three feasible analyses to fulfil that goal come

to mind. First, it can be assumed that *each* itself (rather than *Dist*) has the semantic denotation

specified in (120) and it is covertly raised to *Dist* from its base-generated (and surface) position,

in a way reminiscent of Heim & Lasnik & May's (1991) LF raising of *each*, though the landing

site assumed here is distinct. Second, *each* specified as in (125) is base-generated as the head

Dist and lowered to its surface position in the course of the derivation to PF, by something akin

to Affix Hopping as a morphological rule. Finally, *each* is base-generated at its surface position

and undergoes in-situ association at LF with the *Dist* head as specified in (120) and located as in

(122). It is reminiscent of Chomsky's (2000) operation of Agree, though its motivation, involved

mechanics and application timing are all different. Moreover, we hypothesize that *Coll* and T-

morpheme in JA must also undergo similar association with each other, again in one of the

following settings: (i) *t-* itself is specified as in (121) and undergoes covert raising to a higher

empty position where *Coll* shows up in (122), (ii) *t-* as specified in (121) is the base-generated

Coll head and lowered onto *Dist* and the verb via Affix Hopping, or (iii) *t-* is morphologically

introduced on the verb in the lexicon and undergoes in-situ association at LF with the *Coll* head

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[36] We are interpreting Büring's analysis in the context of the event semantics. Büring assumes that *each* itself is *Dist*

but we have postulated *Dist* as a functional head independent of *each*.

as specified in (121) and located as in (122). We leave it open at this point which (combination of) options would be optimal, though we advance our analysis provisionally with the semantic characterization of *Dist* in (120) and that of *Coll* as in (121).

Finally, appealing to and extending the semantic apparatuses adopted above, let us lay out a semantic analysis of "collective reciprocals" in JA as in (126) below, which can showcase all of the adopted apparatuses.

(126) l-ʔaxu$_1$ w-ʔuxt-uh$_2$ *t*-ʕaawanu   [e]RECIP <1↔2>
      the-brother.NOM and-sister-his.NOM   T-helped

   { ᵒᵏʕala tarkiib   s-sariir   / # — huuh   rakkabi-l-ha
       on   assembling.GEN the-bed.GE   he.NOM   assembled-for-her.GEN

   s-sariir   w-baʕdeen hiih   naððafat-l-uh   l-ɣurfah }.
   the-bed.ACC   and-later   she.NOM   clean-for-him.GEN the-room.ACC

   'The brother and his sister helped each other { ᵒᵏwith assembling the bed / # — he assembled
    the bed for her and later she cleaned the room for him }.'

As the translation indicates, this seemingly intransitive sentence necessarily involves reciprocality, which we have ascribed to the presence of an empty reciprocal anaphor. At the same time, as the compatibility and incompatibility with the highlighted adjuncts indicate, the sentence involves obligatory collectivity induced by morphological T-marking. We believe that the plausibility of our overall analysis can be further illustrated when we can provide a proper semantic analysis of this "collective reciprocality" in JA combining our morpho-syntactic analyses with the semantic apparatuses as in (120)–(122) and (125). In (128) below, we provide the semantic computation of the "collective reciprocal" in (127). Here, we follow Büring (2005: 205) and postulate "binder prefixes β_1 and β_2" to provide the range ($g(r)$) and the contrast ($g(c)$), respectively, as in (127).

(127) [TPl-ʔaxu$_1$ w-ʔuxt-uh$_2$ [CollP *Coll* [β_1 [DistP *Dist* [β_2 [VP *t*-ʕaawanu [e]<1↔2>]]]]]].
      the-brother.NOM and-sister-his.NOM   T-helped
   'The brother and his sister helped each other.'

(128) a. ⟦ T-helped ⟧^{g} = λx λy **λe. e is an event of y helping x**

b. ⟦ T-helped **[e]₁, ₂** ⟧^{g} = λy λe. e is an event of y helping **the x ⊑$_A$ g(1) s.t. x ≠ g(2)**

c. ⟦ **β₂** [T-helped [e]₁, ₂] ⟧^{g} = λy λe. e is an event of y helping the x ⊑$_A$ g(1) s.t. x ≠ **y**

d. ⟦ ***Dist*** [β₂ [T-helped [e]₁, ₂]] ⟧^{g} = λZ λe. **∀y ⊑$_A$ Z**, e is an event of y helping
the x ⊑$_A$ g(1) s.t. x ≠ y

e. ⟦ **β₁** [*Dist* [β₂ [T-helped [e]₁, ₂]]] ⟧^{g} = λZ λe. ∀y ⊑$_A$ Z, e is an event of y helping
the x ⊑$_A$ **Z** s.t. x ≠ y

f. ⟦ ***Coll*** [β₁ [*Dist* [β₂ [T-helped [e]$_{<1↔2>}$]]]] ⟧^{g} = λZ λe. ∀y ⊑$_A$ Z, e is an event of y
helping the x ⊑$_A$ Z s.t. x ≠ y ∧ **∀e₁, e₂ ≤ e**
[[∃yP(e₁)(y) ∧ ∃xP(e₂)(x)] → K(e₁) ∘ K(e₂)]

g. ⟦ TP ⟧^{g} = ∀y s.t. y ⊑$_A$ brother ⊔ sister, e is an event of y helping the x ⊑$_A$ brother ⊔
sister s.t. x ≠ y ∧ ∀e₁, e₂ ≤ e [[∃yP(e₁)(y) ∧ ∃xP(e₂)(x)] → K(e₁) ∘ K(e₂)]

The predicate *t-helped* in (128a) maps some Agent individual (y) to some Theme individual (x) and there is some event (e) of the Agent helping the Theme. Next, the empty reciprocal anaphor *[e]* (each other) in (128b) enters the derivation, indicating that the atomic members of the plural subject as the two arguments involved in the event are distinct from each other. Then, β₂ introduced in (128c) identifies the contrast *g(2)* as *y*. The *Dist* operator in (128d) indicates that for each of the atomic members of the plural subject, there is an event of her/him helping the other. (Z indicates a plurality.) Then, β₁ introduced in (128e) identifies the range *g(1)* as Z. When the *Coll* operator combines with the *Dist* Phrase (*DistP*), it ensures that the two subevents *y helping x* and *x helping y* overlap in both time and space, as indicated by (128f). Finally, the whole sentence (TP) returns 1 if and only if the brother and his sister collectively helped each other, i.e., in shared time and space, as illustrated in (128g). Thus, we can properly compute the semantics of "collective reciprocality" in JA when we postulate *Dist* and *Coll* operators with their event-based semantic characterization, and combine them with our hypothesis that morphological T-marking introduces an empty reciprocal anaphor and obligatory collectivity into a seemingly intransitive construction.

Appendix E — Further examples of sentences and T-marked verbs:

(71) c. **l-walad**$_1$ ḥaka [$_{Ajct}$ ʕan tadriib { ṣḥaab-uh / ***nafs-uh**$_1$ } karaati].
the-boy.NOM talked about training.GEN friends-his.GEN self-him.GEN karate.ACC

'The boy talked about the training of { his friends / *himself } in karate.'

(72) c. l-mudiireen$_1$ gaabalu **l-muawaḍḍafah**$_2$
the-managers.M.DL.NOM met the-employee.F.ACC

[$_{Ajct}$ bi-xṣuuṣ taḥsiin { ***nafs-hum**$_1$ / **nafs-ha**$_2$ }].
in-regard.GEN betterment.GEN self-them.GEN self-her.GEN

'The two male managers met with the female employee about the betterment of { *themselves / herself }.'

(73) c. l-mudiireen$_1$ **t**-gaabalu maʕ **l-muawaḍḍafah**$_2$
the-managers.M.DL.NOM **T**-met with the-employee.**F**.ACC

[$_{Ajct}$ bi-xṣuuṣ taḥsiin { ***nafs-hum**$_1$ / **nafs-ha**$_2$ }].
in-regard.GEN betterment.GEN self-them.GEN self-her.GEN

'The two male managers met with the female employee about the betterment of { *themselves / herself }.'

(74) c. **l-mudiireen**$_{<1+2>}$ gaabalu **baʕḍ-hum** **l-baʕḍ**$_{<1↔2>}$
the-managers.M.DL.NOM met some-them.ACC the-some.ACC

[$_{Ajct}$ bi-xṣuuṣ taḥsiin **nafs-hum**$_{<1+2>}$].
in-regard.GEN betterment.GEN self-them.GEN

'The two male managers met with each other about the betterment of themselves.'

(75) c. l-mudiireen$_{<1+2>}$ **t**-gaabalu maʕ **baʕḍ-hum** **l-baʕḍ**$_{<1↔2>}$
the-managers.M.DL.NOM **T**-met with some-them.ACC the-some.ACC

[$_{Ajct}$ bi-xṣuuṣ taḥsiin **nafs-hum**$_{<1+2>}$].
in-regard.GEN betterment.GEN self-them.GEN

'The two managers met with each other about the betterment of themselves.'

(76) c. l-mudiireen$_{<1+2>}$ **t**-gaabalu **[e]**$_{<1↔2>}$
the-managers.M.DL.NOM **T**-met

[$_{Ajct}$ bi-xṣuuṣ taḥsiin **nafs-hum**$_{<1+2>}$].
in-regard.GEN betterment.GEN self-them.GEN

'The two managers met with each other about the betterment of themselves.'

(77) c. **l-ʔustaaðᵢ**   *t*-naffar
     the-teacher.M.NOM **T**-distanced

   [Ajct min taṭwiir   { ṭulaab-uh   / *nafs-uhᵢ }].
        from improvement.GEN   students-his.GEN   **self-him**.GEN

   'The male teacher distanced himself from the improvement of { his students / *himself }.'

(78) c. l-ʔustaaðᵢ   naffar   **nafs-uhᵢ**
     the-teacher.M.NOM distanced   self-him.ACC

   [Ajct min taṭwiir   { ṭulaab-uh   / ᵒᵏnafs-uhᵢ }].
        from improvement.GEN students-his.GEN   self-him.GEN

   'The male teacher distanced himself from the improvement of { his students / ᵒᵏhimself }.'

(19) b. li-wlaad   *t*-**haadʒamu** ʕa-leeh
     the-boys.NOM **T**-attacked   on-him.GEN

   { ᵒᵏb-nafs   l-wagt   / #b-ʔawgaat   muxtalfeh }.
     in-same.GEN the-time.GEN   in-times.GEN   different.GEN

   'The boys attacked him { ᵒᵏat the same time / #at different times }.'

Table 2': Further examples of T-morphology in JA.

	Input Verb Form	Derived Verb Form	Root	Derived Meanings
a.	2	**5**	*ħ-m-m* 'bathe' *ʕ-l-m* 'teach' *ʔ-d-b* 'behave' *x-b-j* 'hide'	*t-ħammamu* 'they bathed {**themselves**/#each other}' *t-ʕallamu* 'they taught {**themselves**/#each other}' *t-ʔaddabu* 'they behaved {**themselves**/#each other}' *t-xabbu* 'they hid {**themselves**/#each other}'
b.	3	**6**	*s-m-ħ* 'forgive' *ʃ-dʒ-r* 'fight' *ʕ-t-b* 'blame' *ʕ-n-g* 'hug'	*t-saamaħu* 'they forgave {**each other**/#themselve}' *t-ʃaadʒaru* 'they fought {**each other**/#themselve}' *t-ʕaatabu* 'they blamed {**each other**/#themselve}' *t-ʕaanagu* 'they hugged {**each other**/#themselve}'
c.	1	**8**	*r-m-j* 'throw' *ʕ-d-l* 'edify' *r-g-j* 'elevate' *r-dʒ-l* 'act manly'	*ʔir-t-amu* 'they threw {**themselves**/#each other}' *ʔiʕ-t-adalu* 'they edified {**themselves**/#each other}' *ʔir-t-agu* 'they elevated {**themselves**/#each other}' *ʔir-t-adʒalu* 'they acted manly {**themselves**/#each other}'
d.	1	**8**	*f-r-g* 'separate' *dʒ-m-ʕ* 'meet' *x-l-f* 'disagree' *x-l-ṭ* 'mix'	*ʔif-t-ragu* 'they separated from {**each other**/#themselves}' *ʔidʒ-t-amaʕu* 'they met {**each other**/#themselves}' *ʔix-t-alafu* 'they disagreed {**each other**/#themselves}' *ʔix-t-alaṭu* 'they mixed {**each other**/#themselves}'

(43) b. l-ʔixwah　　　　　**t**-xa***bb***u　　　　　bi-s-siddeh.
　　　the-brothers.NOM　**T**-caused.to.hide　in-the.attic.GEN

　　　'**The brothers** caused **themselves** to hide into the attic. (= The brothers hid
　　　 themselves into the attic.)'

(46') F3-**transitive**:

　　a. l-walad　　　　qaasam　***(ṣaaħb-uh)**　　ʕa-*l-keek*.
　　　the-boy.NOM　split　　　friend-his.ACC　on-the-cake.GEN

　　　'The boy split (the shares of) the cake with his friend. (= The boy and his friend split the
　　　 cake.)'

　　b. l-walad　　　s*aa*bag　(***ṣaaħb-uh**)　　*l-bint*.
　　　the-boy.NOM　raced　　　friend-his.ACC　the-girl.ACC

　　　Intended: 'The boy raced the girl with his friend. (= Both the boy and his friend raced
　　　　　　　the girl.)'

(51) c. **l-bint**　　　　　*t*-ðaaħakat　***(maʕ　l-walad)**.
　　　the-girl.NOM　**T**-laughed　　with　the-boy.GEN

　　　'The girl laughed with the boy. (= Both the girl and the boy laughed.)'

(55) c. **l-binteen**　　　　*t*-ð*aa*ħaken { ᵒᵏ*sawijjeh*　　/ ⁺*waħadeh baʕd　θ-θaanjeh* }.
　　　the-girls.DL.NOM　**T**-laughed　　together.ACC　one.ACC　after　the-second.GEN

　　　'**Lit:** The two girls laughed { ᵒᵏtogether / ⁺one after another }.'

(55') c. **l-binteen**<1+2>　　*t*-ðaaħaken **[e]**<1↔2> { ᵒᵏ*sawijjeh*　/ ⁺*waħadeh baʕd　θ-θaanjeh* }.
　　　the-girls.DL.NOM　**T**-laughed　　　　　　together.ACC　one.ACC　after　the-second.GEN

　　　'**Each** of the two girls laughed **with the other** { ᵒᵏtogether / ⁺one after another }.'

(56) c. **l-binteen**　　　　　ð*aa*ħaken　***(l-walad)**.
　　　the-girls.DL.NOM　laughed　　　the-boy.ACC

　　　'The two girls laughed with the boy.'

(57) c. Bader　　*t*-**baaraz** maʕ　Bandar　{ ᵒᵏb-nafs　　　l-wagt　/
　　　Bader　　**T**-fenced　with　Babdar　　in-same.GEN　the-time.GEN

　　　⁺bi-t-tanaawub }.
　　　in-the-turn.GEN

　　　'Bader fenced with Bandar { ᵒᵏat the same time / ⁺in turn }.'

(63) c. l-dʒunuud　　　　　ʔin-*t*-**aħaru**　{ ᵒᵏb-nafs　　　el-wagt　/　ᵒᵏbi-t-tanaawub }.
　　　the-soldiers.NOM　T-suicided　　　in-same.GEN　the-time.GEN　in-the-turn.GEN

　　　'The soldiers suicided { ᵒᵏsimultaneously / ᵒᵏin turn }.'

(64) c. l-waladeen$_{<1+2>}$ ʔi**ʤ**-*t*-a**maʕu** [e]$_{<1↔2>}$ bi-ʃ-ʃaariʕ   { ^{ok}b-nafs   l-wagt /
the-boys.DL.NOM **T**-gathered   in-the-street.GEN in-same.GEN time.GEN

$^{#}$waaħad baʕd θ-θaani   / $^{#}$bi-t-tanaawub }.
 one.ACC after the-second.GEN   in-the-turn.GEN

'Each of the two boys gathered with the other on the street { ^{ok}at the same time /
$^{#}$one after the other / $^{#}$in turn }.'

(65) c. l-walad   ʔi**ʤ**-*t*-amaʕ   ***(maʕ l-bint)**
the-boy.NOM **T**-gathered   with the-girl.GEN
{ ^{ok}eð-ðuhur   / $^{#}$bi-t-tanaawub   }.
    the-noon.ACC   in-the-turn.GEN

'The boy gathered with the girl { ^{ok}at noon / $^{#}$in turn }.'

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