

Verbal strategies for expressing reciprocity – the case of Hebrew

Elitzur A. Bar-Asher Siegal

Hebrew University of Jerusalem

ebas@mail.huji.ac.il

Abstract

This paper delves into the semantics of the reciprocal construction recognized in the literature as "verbal" or "lexical" reciprocals. A common assumption is that predicates of this construction inherently encode a symmetric meaning, often marked morphologically in many languages. This paper advocates for a crucial distinction between two types of predicates: **rec-predicates** (e.g., the Hebrew verb *hitnašek* 'kiss') - a class of predicates that do not inherently denote symmetry but carry an underspecified meaning, so that in specific defined contexts, they can induce a symmetric reading. In contrast, **sym-predicates** (e.g., the Hebrew attribute *zehe* 'be identical') - this class of predicates inherently encodes symmetric relations. Drawing upon Winter's (2002) typology of verbs, it is posited that *rec*-predicates are dyadic, taking two atoms as their arguments, while *sym*-predicates are monadic, with a single argument denoting a set. The analysis in this paper adopts Bar-Asher Siegal's (2020) methodology for identifying **strategies expressing reciprocity** and is substantiated with a survey of the various syntactic structures in which the relevant predicates manifest, along with their diverse interpretations. The paper critically examines previous analyses of these predicates, scrutinizing both empirical and theoretical challenges encountered by these analyses. With a specific focus on verbal strategies for expressing reciprocity in Hebrew, the study, informed by the shared characteristics identified in previous research, suggests that the conclusions drawn for Hebrew may be applicable to other languages as well.

Keywords: reciprocal constructions; reciprocity; symmetry; collectivity; collective predicates; Hebrew; verbal morphology; underspecified interpretation

1. Introduction

The sentences in (1a-b) in Hebrew, along with their English translations, both depict a reciprocal relationship between Yoni and Noa. In contrast, (1c) does not convey such reciprocity.

- (1) a. *Yoni ve-Noa hitnašku*
Yoni and-Noa kiss.REC.PST.3.PL
'Yoni and Noa kissed'.
- b. *Yoni ve-Noa ax-im*
Yoni and-Noa brother-PL
'Yoni and Noa are siblings'.
- c. *Yoni ve-Noa xavrut-im*
Yoni and-Noa friendly-PL
'Yoni and Noa are friendly'.

While (1a) implies that Yoni kissed Noa and that Noa kissed Yoni, and (1b) suggests a symmetric sibling relationship, (1c) does not necessarily indicate mutual friendliness between them, although this interpretation is plausible. The question arises: why is reciprocity inferred in (1a-b) but not in (1c)?

A plausible explanation is rooted in the semantics of the predicates. The verb *hitnašek* 'kiss' inherently implies a reciprocal action, while *ax* 'be a sibling' signifies a symmetric relation by definition. Conversely, the predicate *xavrut* 'friendly' lacks inherent reciprocity and is not conventionally perceived as such. Consequently, when used with a plural subject, *xavrut* triggers a distributive interpretation. In this scenario, each referent of the conjoined subject is deemed friendly independently of the other.

An alternative explanation is that a verb like *hitnašek* conveys a broader, underspecified meaning, which is understood as symmetric in certain contexts. This raises the question of which contexts consistently produce the symmetric reading. Another consideration is whether the symmetric reading is consistently triggered in certain contexts. Therefore, in the case of (1a-b), an inquiry arises as to whether both sentences convey this relation equivalently. The motivation for this inquiry stems from the observation that only (1b) encodes inherently symmetric relations. Consequently, it is contemplated whether, only in this specific instance, it is an integral part of the meaning of the predicate, or of the concept it represents.

The verb *hitnašek* in Hebrew is morphologically marked in contrast to the non-reciprocal verb denoting kissing, *nišek*. It is widely acknowledged in the literature that this morphology indicates the reciprocal component (REC in the glossary) of *hitnašek*. Consequently, sentences like (1a) are frequently categorized as instances of the general phenomenon of "reciprocal constructions," specifically falling under the subtype of "verbal" or "lexical" reciprocals.¹ This

*The symbol γ indicates that a sentence was found on the Internet. $\sqrt{\quad}$ marks a Semitic phonological root. Sections 3's literature review and discussions in Sections 4-6 echo Bar-Asher Siegal (2016) but differ by adding new data, clarifications, and adjustments in presentation and terminology, without substantially altering the analysis.

subtype of constructions features predicates that encode a symmetric meaning, and, akin to Hebrew, many languages employ a distinct morphological form for such instances.

Reciprocal constructions, the diverse ways in which symmetric relations are encoded in natural languages, have garnered significant attention in the past two decades. Notably, Nedjalkov's seminal five-volume typological study in 2007 has been instrumental in this field, along with other contributions such as Frajzyngier & Curl (1999), König & Gast (2008), and Evans et al. (2011).

Since reciprocity is a semantic relation, it is unsurprising that typologies, as outlined by scholars like Lichtenberk (1985: 21), Kemmer (1993: 102), König & Kokutani (2006: 272-273), and Nedjalkov (2007a: 6), define a prototypical reciprocal construction by associating it with a fundamental concept of semantic symmetry. In essence, these constructions are characterized as "means for the expression of symmetrical relations" (e.g., König & Kokutani 2006: 272-273).

Starting from this premise, typologies aim to identify various construction types distinguished by formal characteristics, including lexical categories (such as verbal, pronominal, and adverbial reciprocals) or the degree of bonding (ranging from syntactic and morphological to clitics, or the contrast between analytic and synthetic structures). Frequently, these typologies endeavor to establish *correlations* between the formal properties of these forms and their semantic or diachronic features (for a comprehensive review, see Nedjalkov, 2007a).

Simultaneously, it has been widely recognized that instances of so-called reciprocal constructions do not always entail a symmetric relation (Majid et al. 2011: 50). For instance, consider the sentence in (2), which exemplifies a different type of reciprocal construction, known as the syntactic/nominal/pronominal/NP-type:

(2) They were hiding behind each other.

In this context, if Sam is hiding behind Beth, Beth cannot simultaneously be hiding behind Sam (Fiengo & Lasnik 1973, Dougherty 1974, Lichtenberk 1985, Dalrymple et al. 1998, Haas 2010, Bar-Asher Siegal 2020, *inter alia*). Thus, the question arises about whether a given reciprocal construction entails symmetric relation, in other words whether it denotes reciprocity or not.

Semantic studies aim to understand the relationship between the form of each construction, or each type of construction, and the range of symmetric relations it can convey. While this paper does not delve into the construction exemplified in (2), it aims to similarly analyze the semantics of reciprocal constructions of the type exemplified in (1a-b).

In line with Bar-Asher Siegal (2020) (=BAS), the objective is to identify **linguistic strategies for expressing reciprocity**. This terminology underscores the perception of relevant linguistic expressions as means for conveying reciprocal situations. It is not presupposed that these expressions universally denote reciprocity, as it may not inherently constitute a part of their

¹ The constructions discussed in this paper are classified in Nedjalkov's (2007a) typology as Morphological and Verbal Reciprocals. In König & Kokutani's (2006) typology they belong to the Synthetic Strategy (which is itself a subcategory of the Verbal Strategy). In Knjazev (2007) and Siloni (2012) verbs of this type are called Lexical Reciprocal Verbs.

meaning. A linguistic expression is deemed part of the reciprocal expressions type if it **systematically** conveys symmetry in some manner.

BAS presents a distinct typology for reciprocal constructions, one that is motivated by the semantic objective of providing a compositional analysis of the meaning of various constructions. In this approach, the constituents of a reciprocal construction are the elements responsible for the systematic symmetric interpretation. On one hand, even if a particular formal aspect appears predominant, it is not assumed to be the element responsible for the meaning (as argued in this paper regarding verbal morphology in Hebrew). On the other hand, appearances of a similar type of marking (such as pronominal marking or a suffix) may not be considered part of the same type if they do not share the same meaning in similar contexts. Thus, the identification of formal aspect of the constructions is also the result of the inquiry: once a compositional analysis is provided for the meaning – identifying how the different components contribute to a symmetric interpretation – the parts that play a role in composing the meaning are ipso facto revealed as the elements that constitute the construction.

While the introduction used "symmetry" and "reciprocity" interchangeably, in this article, I will distinguish between the semantic notion of "symmetry" and the grammatical forms, referring to them as "reciprocal constructions" and "strategies for expressing reciprocity" (cf. König & Kokutani (2006)).²

Thus, this paper adopts BAS methodology for identifying strategies expressing reciprocity (Section 2). The various syntactic structures in which relevant predicates can appear and the different interpretations they can convey are subsequently explored (Section 3). Additionally, prior analyses of these predicates are reviewed, and empirical and theoretical challenges they encounter are highlighted (Sections 4-5). As part of the study of these predicates a quantitative study of verbs in Modern Hebrew was conducted using the Agranovsky (forthcoming) database,³ which compiles comprehensive data on the morphology and basic meaning of Hebrew verbs from dictionaries and other digital corpora.

In the concluding sections of the paper, an alternative theory is proposed (Section 6), and evidence is presented to support it (Section 7). Essentially, this article delves into the expansive category of "lexical reciprocals" and emphasizes a crucial distinction between two types of predicates within this category: *rec*-predicates (e.g., the verb *hitnašek* 'kiss.REC' (1a)) - a class of predicates that do not inherently denote symmetry but carry an underspecified meaning. In specifically defined contexts, they can induce a symmetric reading. In contrast, *sym*-predicates (e.g., the attribute *ax* 'be a sibling' (1b)) - this class of predicates inherently encodes symmetric relations. When marking verbs with REC, it is not meant to imply that they denote symmetry, or in cases where there is some morphology associated with this, that this is the semantic contribution of this morpheme. Instead, when a verb like *hitnašek* is glossed as 'kiss.REC', it simply marks a contrast with another verb (*nišek* 'kiss'), and it is emphasized that only the former systematically conveys symmetry in certain contexts. Thus, *rec*-predicates is a category

² Haspelmath (2007) suggests 'mutual' for semantics and 'reciprocal' for specialized expression patterns. This division, to a large extent, parallels with BAS's methodology.

³ The data provided by Agranovsky (forthcoming) comprises solely a list of 57 verbs. All analyses presented in this paper are entirely novel.

of verbs, and the goal of this paper is to understand what constitutes the group of verbs that fall under the category of *rec*-predicates and how they convey symmetry when they do.

In Section 8, a comprehensive examination of the meaning of all Hebrew verbs in Agranovsky's database that can be classified as *rec*-predicates is conducted, dividing them into four groups based on semantics. By identifying correlations between various semantic characteristics of these verbs, a more nuanced analysis of the meaning of *rec*-predicates is offered. An appendix containing all the data about the relevant verbs in Hebrew is included for reference.

The paper focuses on the verbal strategy for expressing reciprocity in Hebrew, where this phenomenon is associated with specific morphology, unlike English. The possibility of applying these conclusions to other languages, both morphologically marked and unmarked, will be explored in the future.

2. Defining a type of construction: The verbal strategy for expressing reciprocity

The primary focus of this study is to understand the relationship between the form and the meaning of the verbal strategy employed for expressing reciprocity. To achieve this objective, the methodology proposed by BAS (p. 2-20) for identifying a strategy for expressing reciprocity is adopted. The typology derived from this methodology involves two primary tasks:

- i. Establishing criteria for classifying constructions as "reciprocal";
- ii. Identifying various types of reciprocal constructions and specifying well-defined criteria for their internal categorization within the broader category.

This typology endeavours to elucidate the correlation between form and the symmetric relation it may represent, thereby enriching the comprehensive comprehension of linguistic expressions conveying symmetry. This approach operates under the premise that languages incorporate **constructions**. Constructions across various languages are categorized as belonging to the same type of reciprocal constructions only if they serve as a strategy for expressing reciprocity in the same way, both grammatically and semantically. In essence, they manifest consistent relationships between form and meaning. Accordingly, they should share a semantic compositional analysis, facilitating comparability in their grammar, encompassing similar morphemes, syntactic structures, etc., and consequently they should convey symmetry within the same defined contexts. Thus, a type of reciprocal construction is defined by the manner in which it functions as a **strategy for expressing reciprocity**, thus articulated as follows:

A type of reciprocal constructions, or a strategy for expressing reciprocity includes all constructions that are composed of grammatically similar components, share the same range of interpretations and exhibit a similar relationship between their grammatical components and semantic properties (including the contexts in which they express symmetric relations.) (BAS, 12)

In accordance with this approach, when examining reciprocal constructions, the object of study encompasses all linguistic expressions that, in specific environments, assert or imply symmetric relations. This typology, therefore, relies on a semantic property as a starting point, which for our purposes can be defined as follows:

- (3) SYMMETRIC RELATIONS: relations R among members of a set A, with at least two argument (valency) positions, with the following semantic property:

$\forall x,y \in A (x \neq y \rightarrow R(x,y))$ and $|A| \geq 2$; that is, for specific substitutions of values a and b ($a,b \in A$) for the variables x and y: $aRb \leftrightarrow bRa$. (BAS, 10, based on König & Kokutani 2006: 272-273.)

The definition in (3) delineates symmetry among instances of a shared relation. This definition doesn't confine itself to inherently symmetric relations like *being a sibling*. Instead, for a set A, symmetric relations exist between pairs where R(x,y) is applicable; in essence, the same relation that a has with b is reciprocated with b having that same relation with a. These symmetric relations may be applicable within a singular eventuality or across various eventualities. In addition, (3) does not mandate an identical degree of participation—allowing for one party to be more active than the other.

This paper focuses on verbal strategies for expressing reciprocity. In certain languages, this strategy is linked with specific morphology, as illustrated in (4):

- | | | | | |
|-----|----|--------------------------------------|--|---------|
| (4) | a. | <i>yoram ve-dan</i>
Yoram and-Dan | <i>hitnašku</i>
kiss.REC.PST.3.M.PL | Hebrew |
| | | 'Yoram and Dan kissed.' | | |
| | b. | <i>O Yiannis</i>
DEF Giannis | <i>ke i Maria filithiikan</i>
and DEF Mary kiss.REC.PST | Greek |
| | | 'Giannis and Maria kissed.' | | |
| | c. | John ve Mary
John and Mary | op-us-tu-ler
kiss-REC-PST-3PL | Turkish |
| | | 'John and Mary kissed.' | | |

In numerous languages, this morphology is affiliated with a wide array of intransitive verbs, only some of which imply symmetry when in the relevant form. (For Kemmer 1993 and Doron 2003, such verbs fall under the broader category of Middle.) Although the type of construction discussed in this paper exists cross-linguistically, the examples will be limited to Modern Hebrew for convenience, in which it is marked with the T-template (for similar data from other languages, see Bar-Asher (2009, chapter 3) and Siloni (2012), among others).⁴ As the discussion unfolds in this paper, it will become evident that the connection between morphology and symmetric meaning is non-trivial, as *rec*-predicates are not limited to the T-

⁴ Based on Agaranovsky's (forthcoming) database, Modern Hebrew comprises 891 verbs in the T-template, with only 48 of them being *rec*-verbs.

template. A key goal of this paper is to comprehend this linkage. The paper now follows BAS four stages in defining and characterizing specific strategies for expressing reciprocity:

Stage One: Identify linguistic expressions that, at least in certain contexts, entail symmetric relations. (BAS, 11)

The initial stage aims to demonstrate that sentences featuring the specific verbal morphology, as in (5a), exhibit semantic equivalence with the structure in (5b). The latter consists of two conjoined sentences where participants symmetrically exchange roles. In essence, (5a) appears to entail (5b), and vice versa.

(5)

<p>a. <i>yoram ve-miriam hitkatvu</i> Yoram and-Miriam write.PST.REC.3.PL</p>	<p><= =></p>	<p>b. <i>yoram katav mixtav-im</i> Yoram write.PST.3.M.SG letter-PL <i>le-miriam ve-miriam katva</i> to-Miriam and-Miriam write.PST.3.F.SG <i>mixtav-im le-Yoram</i> letter-PL to-Yoram</p>
<p>'Yoram and Miriam corresponded'</p>	<p><= =></p>	<p>'Yoram wrote to Miriam and Miriam wrote to Yoram'</p>

As per (3), (5a) entails the symmetric relation (5b), establishing it as a reciprocal construction for the purpose of this study. Thus, an investigation into the components of this construction is warranted.

Stage Two: Identify the grammatical components that produce the symmetric entailment through comparison with a minimally-paired construction that does not produce this entailment. (BAS, 11)

For a compositional analysis, the second stage seeks to identify the elements that constitute the "construction" itself. This identification will enable us to analyze their respective functions. In our case, *prima facie* the distinctive components setting apart (5a) and (5b) are emphasized in bold in (5').

(5')

<p>[<i>Yoram ve-miriam</i>]plural subject Yoram and-Miriam <i>hitkatvu</i> write.PST.REC.3.PL 'Yoram and Miriam corresponded'</p>		<p><i>yoram katav mixtav-im</i> Yoram write.PST.3.M.SG letter-PL <i>le-miriam</i> to-Miriam 'Yoram wrote letters to Miriam'</p>
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(5a) differs from (5b) in three aspects: (i) It features a plural subject with corresponding verbal agreement. (ii) It incorporates a marked form of the verb, known as the T-template in Hebrew. (Note: The gloss 'write.REC' indicates a contrast with the transitive predicate *katav* (5b) without committing to the function of the T-template or the meaning of REC.) (iii) The non-subject argument position of the main verb is (or can be) empty.⁵

This observation serves as a preliminary discussion point. The next sections will demonstrate that it is not self-evident whether all three formal characteristics are necessary for expressing symmetry, specifically constituting the verbal strategy. Section 6.2 evaluates if the symmetric interpretation is consistently linked to all three elements or possibly only to one of them: either the plural subject (i) or the verbal morphology (ii), or perhaps neither, and instead, the various syntactic structures they can appear in and the associated semantics with each.

After outlining the formal features of this construction, the subsequent stages will be explored, aiming to delve into the functions of these forms.

Stage Three: Explore the multifunctionality of the given strategy, namely, all possible semantic relations it can convey (as per Stage Two), and identify the nature of this multifunctionality (polysemy, syncretism, underspecificity etc.) (BAS, 11)

This stage involves an investigation into the fundamental meaning of the construction. If the construction indeed exhibits different interpretations depending on the context, the following questions arise:

- i. Why does the construction have various possible interpretations?
- ii. What determines the choice of interpretation in any given context?

Regarding the first question, the construction's meaning might be underspecified, making the symmetric reading a special case of a more general meaning. Alternatively, the diverse interpretations may arise from polysemy, where the expression has more than one meaning (for a range of possibilities accounting for multifunctionality, see BAS, 6-9). Addressing the first question will lay the groundwork for tackling the second (Section 6.3). The final stage aims to provide a semantic account.

Stage Four: Account for the relationship between the components of the construction, on the one hand, and the symmetric relation, on the other, with reference to the following questions:

- 1) Is the symmetric reading optional or obligatory?
- 2) Is the symmetric reading derived compositionally from the components of the reciprocal construction?
- 3) If not, can the semantic property of symmetry be analyzed as a subcategory of some other semantic property encoded by the construction? And if so, what is that more general property? (BAS, 11-12)

⁵ See König & Kokutani (2006: 272-273) and Haspelmath (2007: 2092-2093) for the importance of this observation in establishing general definitions for reciprocal constructions.

Stages Three and Four will delve deeper into the formal characteristics of constructions like (5a) and explore their potential interpretations. The upcoming sections will question—and ultimately dismiss—an assumption implicit in the preceding discussion, namely that *rec*-predicates with plural subjects, as in (1a), constitute the fundamental strategy for expressing reciprocity.

3. Two types of lexical strategies for expressing reciprocity

Sentences (1a-b) are frequently jointly categorized in the literature—either classified as lexical reciprocals (Knjazev 2007, Nedjalov 2007a: 14) or as symmetric predicates (Winter 2018). In these approaches it is only the case that one the sentence in (1a) is marked morphologically and (1b) is unmarked. Building on the methodology introduced in the previous section, the current discussion seeks to determine whether they genuinely fall into the same category. It is contended that (1a) exemplifies *rec*-predicates, while (1b) is characterized as a *sym*-predicates. Additionally, two observations regarding distinct syntactic environments for *rec*-predicates are presented, challenging the previously outlined formal aspects of the verbal strategy for expressing reciprocity.

Rec-predicates can be observed in two syntactic structures: with a plural subject (as shown in example (6)) and with a singular subject, commonly referred to as the discontinuous construction (7-8) (Nedjalkov 2007a: 28 and Behrens 2007). Furthermore, it is crucial to distinguish *rec*-predicates from *sym*-predicates (10-11). Although these categories share similarities, they diverge in specific aspects. While some of these observations have been noted in the literature, the contrasts introduced here between the two types are novel:⁶

- i. With a plural subject, *sym*-predicates exclusively offer a collective reading, whereas *rec*-predicates also allow a distributive interpretation ((6) vs. (10)).
- ii. When featuring a singular subject, *rec*-predicates permit a non-symmetric reading, unlike *sym*-predicates ((8) vs. (11)).
- iii. *Rec*-predicate verbs,⁷ lacking a direct object, often possess a transitive non-symmetric counterpart without the REC morphology (9), purportedly considered the "basic predicate." *Sym*-predicates always lack such counterparts.

⁶ Winter (2018) distinguishes two predicate types but disagrees with the assertion in (i) and doesn't note the observation in (iii). His focus on English, which lacks morphological marking for *rec*-predicates, results in their formal identity with non-symmetric counterparts. Regarding (ii), he similarly argues that, with a singular subject, only *sym*-predicates entail $aRb \rightarrow bRa$.

⁷ The paper primarily focuses on verbs. An independent analysis should be extended to various adjectives, such as *nasuy* 'married', to determine whether a comparable analysis is applicable.

	<i>rec</i> -predicates	<i>sym</i> -predicates
Plural Subject	(6) <i>yael ve-miriam hitnašku</i> Yael and-Miriam kiss.REC.PST.3.PL i. Collective reading: 'Yael and Miriam kissed each other' ii. Distributive reading: 'Yael and Miriam each kissed someone else (not each other)'	(10) <i>yael ve-miriam zeh-ot</i> Yael and-Miriam identical-PL.F Collective reading only: 'Yael and Miriam are identical'
Singular Subject	(7) <i>yael hitnaška im Miriam</i> Yael kiss.REC.PST.3.F.SG with Miriam 'Yael and Miriam kissed each other' (8) <i>yael hitnaška im ha-kir</i> Yael kiss.REC.PST.3.F.SG with DEF-wall Non-symmetric reading: 'Yael kissed the wall'	(11) <i>yael zeha-a le-miriam</i> Yael identical-F.SG to-Miriam 'Yael is identical to Miriam'
Transitive non-symmetric counterpart	(9) <i>rut niška et miriam</i> Yael kiss.PST.3.F.SG ACC Miriam 'Yael kissed Miriam'	N.A.

Table 1: Differences between *rec*-predicates and *sym*-predicates.

Further scrutiny of sentences (6-8) and their counterpart with the so-called basic predicate (9) prompts a re-evaluation of the verbal strategy and its features. This discussion revolves around key questions:

- i. What is the relationship between *rec*-predicates (6, 7) and basic predicates (9)? Can a derivation be posited between them and if so, what operations are implicated?
- ii. What links *rec*-predicates in (6) and (7), and what underlies the distributive reading with plural subjects (6ii)?
- iii. While Miriam appears to play the same semantic role in (6) and (7), the crucial question is whether this phrase functions as an argument or an adjunct in sentence (7) (the answer dictates the argument structure of the *rec*-predicate, offering insights into its derivation).

Table 2 summarizes prior analyses of verbal reciprocals, offering a brief overview and highlighting distinctions from the approach in this paper.

	Relationship between (9) and (6-7) (question i)	Relationship between (6) and (7) (question ii) ⁸	Status of the oblique expression in (7) (question iii)	Nature of the <i>rec</i> -predicate
Dimitriadis (2008a,b)	Semantic operation (9)>(6) same argument structure	(7)>(6) Reflexivization	Argument (one of the two arguments in a symmetric relation)	Symmetric predicate
Siloni (2012)	Lexical operation (9)>(6-7)	Two lexical entries	Phrase unvalued in terms of thematic role	Take as an argument a set each of whose members have two thematic roles
Current proposal	<i>No derivational relationship</i>	<i>Two realizations of the same lexical entry</i>	<i>Argument with a lexical role</i>	<i>Predicate with two arguments; not necessarily symmetric</i>

Table 2: Previous literature on *rec*-predicate

The previous analyses agree on the following points:

- i. *Rec*-predicates **denote** symmetry.
- ii. They derive from a non-reciprocal/basic predicate – this derivation involves a lexical/semantic process that yields a symmetric interpretation.⁹
- iii. Siloni (2012)¹⁰ treats *rec*-predicates as monadic predicates that take a set as their argument.

These points are interconnected: these approaches link the symmetric reading to predicates taking sets as arguments. Theories agreeing on (iii) view *rec*-predicates as essentially akin to *sym*-predicates in (10-11), differing only in *sym*-predicates not deriving from another basic predicate (9), and that *rec*-predicates are *sym*-predicates derived through a process of reciprocalization. Thus, for Dimitriadis (2008a,b) and Siloni (2012), *rec*-predicates are a subtype of *sym*-predicates, denoting only irreducibly symmetric events, as defined below:

⁸ See also Ginzburg (1990) and Rákosi (2003).

⁹ Siloni (2008, 2012), Doron (2003, 2008), and Doron & Hovav (2009) view reciprocalization as a diathetic operation akin to reflexivization, reducing verb valency. For reasons opposing the link between reciprocity and reflexivity in this strategy, see Bar-Asher Siegal (2016: 22-23).

¹⁰ According to Winter (2018) only with plural subjects the *rec*-predicates take a set as their argument.

Definition: A predicate is irreducibly symmetric if (a) it expresses a binary relationship, but (b) its two arguments have necessarily identical participation in any event described by the predicate (Dimitriadis 2008a: 378).

However, as shown in Table 1, *rec*- and *sym*-predicates differ in various other aspects: only *rec*-predicates display a distributive reading with plural subjects and exclusively allow a non-symmetric interpretation with singular subjects. It is essential to elucidate these differences to determine whether *rec*- and *sym*-predicates truly belong to the same predicate type.

As for the source for the two readings with plural subjects, Siloni (2012, n. 7) argues that *rec*-predicates have two entries in the mental lexicon, monadic and dyadic, associated with the collective and distributive readings, respectively. (12) schematizes the two representations, according to this approach:

- (12) Reciprocal verb:
- a. Monadic: V_{SYM}[Ag-Th];
 - b. Dyadic: V'_{SYM}[Ag-Th],[Ø-WITH]

According to her analysis, only the monadic *rec*-predicates are similar to *sym*-predicates.

This paper proposes a distinct perspective, asserting the existence of a singular *rec*-predicate type that systematically differs from *sym*-predicates. The distinctions between these predicates, as outlined in this study, can be summarized as follows:

***Sym*-predicates take sets as arguments (thus, lacking a distributive reading), and symmetry is inherent in their meaning (precluding a non-symmetric interpretation).**

***Rec*-predicates take atoms as arguments (allowing a distributive reading), and symmetry is not inherent in their meaning.**

In this perspective, *sym*-predicates inherently embody symmetric relations, while the symmetric readings of *rec*-predicates emerge differently. *Sym*-predicates, being monadic predicates over sets, lack non-symmetric counterparts. Conversely, *rec*-predicates function as a strategy for expressing reciprocity, capable of systematically describing symmetric relations without inherent symmetry (Section 8 will refine *rec*-predicate definitions, acknowledging inherent symmetric relations in some cases).

Contrary to previous analyses, this study posits:

- i. No necessity for (6-7) to semantically derive from (9)
- ii. (6) and (7) represent two syntactic realizations of the same lexical entry/predicate, exhibiting distinct distributive and collective meanings due to atoms as arguments.
- iii. The oblique phrase functions as an argument of the predicate.

This analysis challenges alternative approaches by demonstrating:

- i. *Rec*-predicates don't necessarily denote symmetry (e.g., (8), expanded in Section 4).
- ii. No requirement for a derivational process of reciprocalization, transforming non-symmetric to symmetric interpretations (Section 5).
- iii. *Rec*-predicates operate over atoms, not sets (Section 7.3).
- iv. The distributive and collective readings of *rec*-predicates with plural subjects (6i-ii) involve the same predicate (Section 6.1), unlike *sym*-predicates, which only have collective readings due to their set range.

4. *Rec*-predicates do not necessarily denote symmetry

Contrary to conventional assumptions, *rec*-predicates are not inherently symmetric. Some studies highlight their usage even when only one participant actively engages (Kruitwagen et al. 2017), and with singular subjects, they may not necessarily imply symmetric relations, as exemplified in (8) (repeated here), (Dong 1971; Gleitman et al. 1996; Carlson 1998; Dimitriadis 2008a; Winter 2018):

- (8) *yael hitnaška im ha-kir*
 Yael kiss.REC.PST.3.F.SG with DEF-wall
 'Yael kissed the wall'

While (8) involves two participants, it doesn't necessarily entail that both are active in the same way. Assuming *rec*-predicates inherently encode symmetry, various potential explanations emerge:

Siloni (2012) propose that sentences like (8) involve a distinct, non-reciprocal predicate. Since all *rec*-predicates allow varying levels of agency in suitable contexts,¹¹ a theory positing a single lexical entry for each verb is preferable.

An alternative explanation can be that these instances might be metaphorical uses of *rec*-predicates (e.g., Yael kissing the wall as if it were a person). Yet, why aren't these metaphorical readings available with other reciprocal constructions like pronominal (8'a) or plural verb structures (8'b)?

- (8') a. *#yael ve-ha-karit nišku exad et*
 Yael and-DEF-pillow kiss.PST.3.PL one ACC
ha-šeni
 DEF-second
- b. *#yael ve-ha-karit hitnašku*
 Yael and-DEF-pillow kiss.REC.PST.3.PL
 Int. 'Yael and the pillow kissed each other'

¹¹ For more examples see Bar-Asher Siegal (2016, n. 8).

This suggests the asymmetric reading may be related to the singular subject. Thus, alternatively, one may adopt the simplest explanation: ***rec*-predicates don't inherently encode symmetry**. According to this view, *rec*-predicates are dyadic, with one argument as the 'agent' and the other as the 'patient/partner' (Rákosi (2003) suggests 'PARTNER' as a thematic role). Unlike *sym*-predicates, they don't inherently convey symmetry. The question is whether it is feasible to uniformly treat all *rec*-predicates, regardless of singular or plural subjects, and still provide an account for symmetric interpretations when they occur.

5. Problems with derivational approaches

As outlined in Section 3, prevailing approaches posit a derivational link between basic non-symmetric predicates (9) and *rec*-predicates (6-7). Crucially, these approaches attribute the symmetric interpretation of the latter to this derivation.

The question whether there is a derivation holds significance. In prior approaches, *rec*-predicates (6-7) are derived from (9), with a crucial semantic shift via reciprocalization to a symmetric predicate. The apparent contrast between the basic predicate and *rec*-predicates seemingly supports this view. This paper challenges this assumption, contending that although sometimes basic predicates and corresponding *rec*-predicates in Hebrew may share similar phonological roots, there is no inherent semantic-derivational relationship between them. They align with Arad's (2005) concept of Multiple Contextualized Meaning Verbs, where similar phonological roots don't entail grammatical or semantic derivation. Hence, *rec*-predicates need not be associated with any specific meaning. This section presents arguments against the derivational approach, focusing on the semantic component of symmetry. It should be emphasized that this stance doesn't contest other possible morphological/syntactic derivations.¹²

5.1 Deponent¹³ reciprocal verbs

Cross-linguistically, numerous *rec*-predicates lack a transitive counterpart yet convey a symmetric sense (Kemmer 1993: 30-31; Nedjalkov 2007a:14; Knjazev 2007:118-119). Hebrew presents denominative reciprocal verbs, such as *hit'ales* 'make love,' existing in the T-template without a seemingly more basic transitive counterpart. Notably, among the 57 Hebrew *rec*-predicates in our dataset, 18 fall into this category. Additionally, four predicates have a distinct verb in the same root in a transitive template with a completely different meaning—e.g., *hit'agref* 'box' and *igref* 'clench the fist.'

¹² A reviewer recommended labeling the relationship between basic and *rec*-predicates as non-productive or lexicalized (Nedjalkov 2007a: 15). However, the frequency of new *rec*-predicates doesn't imply a derivation process necessarily. Modern Hebrew still introduces new *rec*-verbs, often through analogy in neologism. The formation of these verbs may involve using existing phonological roots with related meanings, without assuming derivation from one verb template to another. Exploring the complete conceptual relationship between productivity and derivation is beyond this article's scope.

¹³ Following Kemmer (1993) and others, this term is used to describe morphologically marked *rec*-verbs that have no transitive counterpart, i.e., a "basic predicate" in an active form based on the same root.

Hebrew, overall, encompasses 14 verbs expressing various forms of communication. This category of verbs possesses another unique aspect. As noted in Section 3, according to the literature (Carlson 1998, Dimitriadis 2008a,b, and Siloni 2012), *rec*-predicates are considered irreducibly symmetric. This implies that these verbs express a binary relationship where both arguments equally participate in any event described by the predicate, precluding the possibility of uni-directional sub-events with asymmetric relations. However, this stronger entailment is not applicable to verbs of communication, such as *hitkatev* ‘correspond.’ The denotation of these verbs can be decomposed into sub-events, each involving the delivery of a message (e.g., sending a letter) from one person to another.

5.3 Reciprocity of the transitive verb

Derivational approaches to *rec*-predicates often hinge on the observation that, in numerous languages, they appear to be morphologically derived from more basic transitive verbs (Siloni 2008). Modern Hebrew, akin to other Semitic languages, constructs verbs by incorporating phonological roots into diverse morphological templates. Verbs originating from the same root in various templates exhibit distinct yet often interconnected meanings, as discussed by scholars such as Aronoff (1994), Doron (2003), and Arad (2005), among others. The forms presented in Table 3 illustrate this phenomenon using the root $\sqrt{\text{gdl}}$ across seven different templates (where C represents the consonants of the root):

$\sqrt{\text{gdl}}$ Verbal templates:

- a. CaCaC (basic-template) *gadal* 'grow'
- b. NiCCaC (N-template) *nigdal* 'become big'^{i,ii}
- b. CiCeC (intensive-template) *gidel* 'raise, cultivate' b.' CuCaC *gudal* "was raised"
- c. hiCCiC (causative-template) *higdil* 'enlarge' c.' huCCaC *hugdal* "was enlarged"
- d. hitCaCeC (T-template) *hitgadel* 'become bigger'

- i. This root is used for illustrative purposes, and the N-stem form with this verb was limited to Medieval Hebrew.
- ii. The N-template also serves as a passive form with transitive verbs.

Table 3: The templates systems in Hebrew.

In Hebrew, 48 out of the 57 *rec*-predicate verbs are found in the T-template (see Section 5.4). Proponents of the derivational approach assert that *rec*-verbs in the T-template (as in (6)) are derived from verbs in the basic- or intensive-template (as in (9)), and that this derivation involves a process that is semantically or syntactically linked to reciprocalization (see Section 2). However, the data presents a more nuanced picture, as only 17.5% (10 out of the 57) of Hebrew *rec*-predicates are part of the trio constructions illustrated in examples (6)-(9) (8 with the transitive counterpart in the intensive-template, and 2 in the basic-template.)

The rest fall into two categories: those discussed in previous sections (5.1-2), and cases where the counterpart verb also denotes symmetry. In fact, in 35% of the verbs (20 verbs, including 15 in the intensive-template, 4 in the causative-template, and 1 in the basic-template),

symmetry is inherent to the meaning of the transitive verb as well,¹⁶ evident when the verb expresses a symmetric relation between its internal arguments, as exemplified in (14):

- (14) a. *yoram imet et dan im raxel*
 Yoram confront.PST.3.M.SG ACC Dan with Rachel
 'Yoram caused Dan to have a confrontation with Rachel'
- b. *dan ve-raxel hit'amtu*
 Dan and-Rachel clash.REC.PST.3.PL
 'Dan and Rachel clashed'

The verb in (14a) is in the intensive-template, similar to the verb in (9). However, unlike (9), it also incorporates a symmetric meaning, akin to its T-template counterpart in (14b). (14a) adds the cause to the symmetric relation. It is noteworthy that the proposition in (14a), with the intensive verb, entails the one in (14b), with the T-template verb, whereas (9) does not entail (6). These distinctions likely stem from the fact that the verb in (14) depicts inherently symmetric relations, as confrontation is by definition symmetric. In contrast, the verb in (9) does not inherently describe symmetric relations. If a kissed b, it does not necessarily entail that b kissed a. Only the corresponding *rec*-predicate describes an engagement characterized by a symmetric relation.

While a detailed morphological exploration of this dataset extends beyond this paper's scope, it is still possible to consider a few theoretical options. The first one, is to consider the possibility of a bi-directional derivation:

Intensive template => T-template

OR

T-template => intensive template

In (6), the *rec*-predicate may derive from (9), but in (14), transitive predicates appear to originate from *rec*-predicates. In the latter, the functional head introducing the thematic role of agent/cause takes the *rec*-predicate (and not just the root) as input. This challenges theories positing that this function exclusively takes the basic-lexical-entry/root as input, necessitating an additional operation for symmetry. The essence of the matter lies in inherently symmetric verbs, such as those in (14), raising the question of whether verbs in the T-template are truly 'derived' from the root or potentially 'originated' within the T-template due to their intrinsic meaning. In simpler terms, this implies there may be no derivation from another basic predicate, and instead, symmetric predicates are coined directly within the T-template.¹⁷

Given these considerations, maintaining an approach asserting that *rec*-predicates necessarily derives from a semantic operation, forming symmetric verbs from non-reciprocal predicates,

¹⁶ There are instances where the non-reciprocal verb is in the basic stem, for example, *nagax* 'butt,' with the reciprocal counterpart *hitnagax*. Furthermore, cases exist where the symmetric meaning is in the N-template, while the causative element is in the causative-template, as seen in *nicmad* 'glue' versus *hicmid* '(cause to) glue.'

¹⁷ Doron (2003, 2008) observes that certain causative template verbs must originate from a T-template, not directly from a basic non-symmetric predicate. Nevertheless, Doron still needs to clarify why verbs with an additional causer are in the intensive template, rather than the causative template.

appears challenging. Instead, one may find it necessary to adopt one of the following perspectives:

Non-Derivational Approach for *rec*-predicates: In this perspective, *rec*-predicates are viewed as commonly manifesting in the T-template, and this occurrence is posited as not originating from a derivational process. This holds true whether symmetry is inherent to the predicate's meaning or if the *rec*-verb is associated with another asymmetric predicate in the lexicon, or when it is an independent predicate in the lexicon. (The subsequent sub-section delves into supporting evidence for this alternative viewpoint.) Notably, there is no derivational relation, and symmetry should not be assumed as part of the meaning.

Non-Semantic Analysis: Alternatively, a non-semantic analysis of the derivation can be considered. When examining verb derivations, particularly in instances like (14a-b) and (6-9), one may propose that the derivation consistently proceeds from the intensive-template to the T-template. In the intensive-template, verbs inherently carry the external argument. The operation leading to the T-template, regardless of context, involves eliminating this external argument. Functioning solely as a diathetic operation, it signifies valency reduction. Within this framework, a clear distinction is made between the meaning of *rec*-predicates and the lexical/syntactic derivation process. The latter is not categorized as semantic one.

In our context, neither option posits that *rec*-predicates emerge from a semantic operation involving a reciprocalization of a basic transitive predicate. Therefore, one should avoid assuming that these predicates inherently denote symmetry based on the relationship between certain predicates that may seem to represent such a relation between them.

5.4 Morphologically unmarked verbal reciprocals

Hebrew verbs can describe symmetric events even in the absence of T-template morphology, which is traditionally associated with marking symmetry. *Rec*-predicates, such as *nicmad* 'stuck' (N-template), *rav* 'to quarrel' (basic-template), and *soxeax* 'to converse' (intensive-template), demonstrate the versatility of expressions in different templates. Within the realm of Hebrew verbs, 9 out of 57 fall into this category.¹⁸ This poses a challenge for derivational approaches that assume a direct one-to-one correlation between structure/meaning and form, as advocated by Doron (2003). The existence of these verbs suggests that reciprocal expressions form a semantic class, irrespective of their formal representation. Even when considering the possibility of semantic derivation for specific verbs from others, this derivation may not directly manifest in the morphological structure.

Notably, these verbs demonstrate all the features delineated in (6)-(9) and share the syntactic characteristic of being unable to co-occur with a direct object, despite lacking a middle morphology (T-template in Hebrew):

¹⁸ According to Doron (2008), roots in a single template may diverge from typical semantics associated with that template. The *rec*-verbs *rav* 'fight' and *diskes* 'discuss' align with this pattern, exclusively in the transitive templates. The verb *soxeax* 'converse' partially deviates as it has a counterpart in the basic template at a higher register. It's essential to note that Doron's exception rule faces theoretical challenges, but delving into them exceeds the paper's scope.

(15)	<i>yoram</i>	<i>rav/soxeax</i>	<i>im</i>	<i>rina/(*et</i>	<i>rina)</i>
	Yoram	quarrel/converse I.PST.3.M.SG	with	Rina/ACC	Rina
	'Yoram quarrelled/conversed with Rina'				

Thus, irrespective of their form, these verbs not only belong to the same semantic class but also consistently exhibit similar syntactic behaviour.

5.5 Preliminary conclusions

While Hebrew *rec*-predicates are often portrayed through a trio of constructions (the singular-subject construction (7), the plural-subject construction (6), and the corresponding transitive (non-reciprocal (9)), our lexicon examination challenges this view. Only 17.5% of Hebrew *rec*-predicates fit this model, primarily those involving physical contact that often involve emotions like 'kiss' and 'hug.' The majority follow different patterns, either being deponent or falling into specific types.

The notion that *rec*-predicates derive from a more basic transitive root/verb, involving a semantic transformation into a symmetric predicate, originated from verbs conforming to this pattern. However, the realization that this holds true only for a minority of verbs prompts a reconsideration of this view. Moreover, compelling reasons against assuming such derivation emerge throughout this section. Explanations for the facts in sections 5.1 and 5.3 become more straightforward without assuming such derivation. The data in section 5.2 contradicts a derivational approach, and section 5.4 challenges derivational approaches assuming a direct one-to-one correlation between structure/meaning and form. Even if reciprocalization is a semantic process, it may not necessarily be reflected in the morphology.

The derivational approaches proposed by Siloni (2012) and Dimitriadis (2008a, b) was primarily motivated by semantic considerations, positing *rec*-predicates as symmetric versions of basic predicates. However, as demonstrated in Section 4, *rec*-predicates do not consistently convey a symmetric meaning, casting doubt on the semantic foundation of the derivational approach. Given these observations, it is imperative to propose an alternative lexical and semantic analysis for *rec*-predicates.

The data in Section 5.4 holds significant implications for understanding the "verbal strategy for expressing reciprocity" (Stage Two in the methodology outlined in Section 2). These predicates, linked with verbs, exhibit specific semantic and syntactic features, revealing a correlation between syntax and semantic interpretation. Essentially, these predicates consistently represent symmetric events in certain contexts. However, it is evident, at least in Hebrew, that this predicate type is not *necessarily* tied to a specific morphology. The open question pertains to whether a plural subject is integral to defining this construction, a query connected to the argument structure of these predicates and their syntactic realization. The forthcoming section will center on this vital inquiry, paving the way for a semantic explanation of the multifunctionality of these predicates and the systematic interpretations they evoke in specific contexts (Stage Four in the methodology outlined in Section 2).

It's important to highlight that the semantic analysis presented in the subsequent sections is self-contained and does not depend on the acceptance of the viewpoint regarding the derivational relationship between the basic and the reciprocal predicates outlined in this section.

6. *Rec*-predicates as a strategy for expressing reciprocity

6.1 The source of the collective readings

As noted in Table 1, *rec*-predicates with plural subjects have two readings:

(6) *yael ve-miriam hitnašku*
 Yael and-Miriam kiss.REC.PST.3.PL

- i. Collective reading:
 'Yael and Miriam kissed each other'
- ii. Distributive reading:
 'Yael and Miriam each kissed (and were kissed by) someone else' (i.e., not each other)

The terms "distributive" and "collective" are employed here following the conventions in *rec*-predicates literature (e.g., Winter 2018). Distributivity implies that the predicate applies to all members or subsets of a particular set, as seen in the distributive reading of (6): both Yael and Miriam participate in an act of reciprocal kissing. Contrary to the opposition often found in literature, the collective reading of (6) also involves Yael and Miriam engaging in reciprocal kissing. Positively defined here, collectivity adds an entailment about the plural entity, signifying that an *irreducibly symmetric event* of reciprocal kissing occurred between Yael and Miriam (see section 2). (See Champollion (2021) for the various uses of the notion of collectivity. See also Dowty 1986; Ginzburg 1990; Schein 1993; Lasersohn 1995; Landman 2000, Winter 2002 and Champollion 2016).

In previous literature, collective readings have been accounted for in various ways, among them the following:

- i. Collections/sets have an ontological status of their own (e.g., Winter 2002).¹⁹
- ii. There are only individuals (atoms) – everything else can be reduced to quantification over eventualities (e.g., Schein 1993).

Considering the diverse semantic relations that the term "collective" can encompass—some entailing non-distributivity and others not—it becomes crucial to precisely determine the nature used in the current discussion. This paper adopts the first approach, positing an ontological status of collection. However, it contends that what was labelled as the collective reading of (6) demands a distinct account, emphasizing the following distinction:

¹⁹ Semantically they can derive from a plural-forming operator (Link 1983) or can denote plural entities. This, however, is irrelevant to the analysis.

- i. Lexical collectivity: Involves predicates that take sets as their arguments.
- ii. Syntactic collectivity: Encompasses plural subjects with atom predicates, where all participants denoted by the plurality engage in the same event.

This differentiation between atom- and set-predicates follows Winter's (2002) typology of predicates, based on a general principle proposed for the lexical semantics of predicates:

The atom/set principle: Denotations of lexical atom predicates range over atoms. Denotations of lexical set predicates range over sets of atoms.

The argument posits that *rec*-predicates function as dyadic predicates, taking atoms as their arguments. Considering that sentences with *rec*-predicates involve at least two participants, if these participants are not encoded as a single set-argument, an alternative argument structure must be proposed to account for the various interpretations. The analysis unfolds in three stages:

- i. An analysis is proposed for *rec*-predicates with singular subjects (Section 6.2).
- ii. Building on this, the distributive reading of plural-subject *rec*-predicates is accounted for (Sections 6.2).
- iii. It is then argued that this analysis also accommodates the collective reading of plural-subject *rec*-predicates (Section 6.3).

This approach eliminates the need to assume more than one lexical entry for each of these predicates.

6.2. The argument structure of *rec*-predicates

In addressing the argument structure of *rec*-predicates, a key question revolves around the oblique expression in the discontinuous construction (7). It is proposed that this oblique expression is an argument of the *rec*-predicate, and (16) represents the basic argument structure (AS) of such predicates:²⁰

(16) *rec*-predicate (*rec*-er, *rec*-ed)

This AS representation offers minimal information about the predicate, presenting the *rec*-predicate itself, the presence of only two arguments, and their lexical roles: *X-er* signifies a lexical role equivalent to an active participle, while *X-ed* represents a role equivalent to a passive participle. Despite its simplicity, this information suffices for the current discussion's needs, determining the presence of two (atom) arguments or just one (set) argument and whether they share the same lexical/semantic role. (16) indicates the presence of two arguments with distinct lexical/semantic roles.

²⁰ CF. Rákosi (2003) for a proposal similar to (16), but limited to the discontinuous construction.

This analysis begins with (16), providing a reasonable criterion for being an argument of a predicate and realizing one of its lexical roles (for justification, see Bar-Asher (2009, chapters 1-2)):

- (17) To be an **argument of a predicate**²¹ is to be a function (=of a lexical role), the *argument* of which is bound with an existential quantifier in every instantiation of the predicate.

Applying the definition to *rec*-predicates involves assessing the lexical functions entailed by every instantiation of the predicates to establish whether the participants in question function as arguments. Considering the entailments of *rec*-predicates with singular subjects and their consistent ability to convey asymmetric readings, as illustrated in (8):

- (8) *yael* *hitnaška* *im* *ha-kir*
 Yael kiss.REC.PST.3.F.SG with DEF-wall
 'Yael kissed the wall'

It becomes evident that symmetry is not necessarily implied. The entailment derived from all instances of this predicate (as represented in (18)) suggests that there must always be at least one hugger (acting in accordance with the denotation of the *rec*-predicate) and one being hugged (equivalent to the patient in the non-reciprocal predicate), but not necessarily two huggers and two being hugged.

- (17) $\forall e [rec-hug' (e) \rightarrow \exists x \exists y (rec-hugger (e, x) \wedge hugged (e, y))]$

Thus, (18) can be proposed as the AS for this predicate:

- (18) a. *rec-hug* (*rec-hugger*, *hugged*)
 b. *rec-hug'*: $\lambda y \lambda x \lambda e [rec-hug' (e) \wedge rec-hugger (e, x) \wedge hugged (e, y)]$

In languages without reciprocal morphology, like English, it is hard to express this formula verbally in an intuitive way, because distinguishing between the transitive predicate (9) and the reciprocal predicate (6-7) is difficult. Utilizing Hebrew terminology, one can convey that *hitxabqut* ('*rec*-hugging') involves a *mitxabek* (the active participle of the *rec*-verb) and a *mexubak* (the passive participle of the non-reciprocal-verb). Building on this, (16) is proposed as the AS for *rec*-predicates:

- (16) *rec*-predicate (*rec-er*, *rec-ed*)

Note that (16) is not posited as the function of the morphology linked to *rec*-predicates. Instead, it defines the argument structure (AS) common to all predicates exhibiting the pattern in (6-8). This serves as a shared foundation for verbs demonstrating collective and distributive

²¹ When discussing a lexical predicate's argument, the aim is to distinguish between arguments and adjuncts. In (17), however, "argument" inside the definition, is used mathematically as a function input.

symmetric readings with plural subjects, and appearing in the discontinuous-construction, where a symmetric reading is not obligatory. As observed in Section 5.4, such verbs may take on various Hebrew templates.

The underlying concept of this proposal is that, while *rec*-predicates often denote irreducibly symmetric events, this does not mandate labeling them as irreducibly symmetric predicates. In other words, symmetry is a feature of the relations among participants in an event, but it is not intrinsic to the content of *rec*-predicates. Except when discussing the verbs covered in Section 5.3, symmetry is not inherent to the meaning of these verbs, leading to their treatment merely as a *strategy* for expressing reciprocity.

Moreover, if (16) accurately represents the AS of these predicates, the discontinuous-construction—where the *rec*-er is portrayed as the subject and the *rec*-ed as an oblique expression—constitutes their fundamental realization. Revisiting Stage Two of the methodology for identifying strategies for expressing reciprocity (outlined in section 2), which involves pinpointing the grammatical components uniquely marking the specific construction, it is possible now to ascertain that it is solely the verb characterizing this construction, and the way the *rec*-ed is represented with the associative preposition. Contrary to common assertions in the literature (Doron 2003, Siloni 2012) the plural form of the verb or the absence of another argument are not distinctive features.

In light of this, the distributive reading of the plural-subject construction like (6) is a natural interpretation, as the default reading of atom predicates is the distributive one (in our case, indicating that both Yael and Miriam are *rec*-kissers).

- (6) *yael ve-miriam hitnašku*
 Yael and-Miriam kiss.REC.PST.3.PL
- i. Collective reading:
 'Yael and Miriam kissed each other'
 - ii. Distributive reading:
 'Yael and Miriam each kissed someone else (not each other)'

Hence, sentences with plural subjects imply implicit *rec*-kissed arguments. Indeed, as illustrated in (20), even with a singular subject, leaving the *rec*-ed argument implicit is possible:²²

- (20) *tir'e ex hi smexa, ro'im ale-ha*
 look.IMP.SG how she happy.SG.F see.PRS.PL.M on-3.SG.F
še-hi hitnaška
 REL-she kiss.REC.PST.3.F.SG
 'Look how happy she is, you can see on her that she kissed someone' (implied: reciprocal kissing)

²² Out of context, a sentence with an implicit argument appears odd. This may be attributed to the necessity of having a reason to singularly emphasize the *rec*-er and their action. The first sentence of (20) provides such motivation.

Regarding the collective readings of *rec*-predicate sentences (6i), it was previously mentioned that, according to Siloni (2012), they entail a different predicate. In her analysis, *rec*-predicates have two entries in the mental lexicon: a monadic entry, generating the collective reading (6i) (also Winter 2018), and a dyadic one, generating the distributive reading (6ii). As outlined earlier, (12) provides the two entries associated with a *rec*-predicate in this approach:

(12) Reciprocal verb:

a. Monadic: $V_{SYM}[Ag-Th]$;

b. Dyadic: $V'_{SYM}[Ag-Th],[\emptyset-WITH]$

Systematically associating predicates with two lexical entries is an undesirable outcome from a theoretical perspective. Instead, it is proposed that the collective reading is a specific interpretation of an atom predicate, one of two interpretations consistently available with such predicates. The underlying idea is that, in each of the two sets of sentences below (21-22), the (c) sentence, featuring a plural subject, depicts the same event as, and shares identical semantic composition with, sentences (a+b). The symmetric reading of (22c) is therefore pragmatically derived, inferred in contexts where (a) and (b) are understood to describe the same event:

- (21) a. John kissed (Jacob).
 b. Betty kissed (Mary).
 c. John and Betty kissed.²³
- (22) a. John kissed (Betty).
 b. Betty kissed (John).
 c. John and Betty kissed.

To clarify, in cases where the subject is plural, implicit arguments are consistently inferred. These may manifest as an anaphoric expression, like a covert reciprocal pronoun (23a),²⁴ or as an existential expression, like a covert indefinite pronoun (23b).²⁵

- (23) a. *yoram ve-rina hitnašku* (*exad im ha-šeni*)
 Yoram and-Rina kiss.REC.PST.3.PL (*one with DEF-second*)
 'Yoram and Rina kissed (each other)'
- b. *yoram ve-rina hitnašku* (*im mišehu*)
 Yoram and-Rina kiss.REC.PST.3.PL (*with someone*)
 'Yoram and Rina kissed (someone)'

²³ For most speakers of English, out of context the default reading of (22c) is the collective one, while the distributive reading is unavailable. However, this reading is available in certain contexts, such as the following:

All the kids in the class kissed for the first time this year.

A salient interpretation of this sentence is that each kid kissed someone for the first time this year, not necessarily one of the other kids in the class.

²⁴ Gleitman (1965: 282-283) proposes this as the underlying structure of *rec*-predicates.

²⁵ Cf. Fillmore (1986), Shopen (1973) and Condoravdi & Gawron (1996), who observed that there are two types of implicit arguments, associated with a similar distinction.

The utilization of a covert reciprocal pronoun (23a) results in a collective reading of the sentence, while (23b) brings about a distributive reading through the use of a covert indefinite pronoun. These distinct interpretations can be accounted for by positing different implicit arguments, without necessitating different predicates.²⁶ Alternatively, it could be posited that the structure in (23b)—with an underspecified meaning—is the default, and the more specific collective reading is pragmatically inferred in specific contexts. The ensuing sections contend that (23b), with a covert indefinite pronoun, serves as the default implicit argument, but the reciprocal anaphora (23a) as the implicit argument becomes necessary in particular contexts. The subsequent section delves deeper into the possibility of an underspecified meaning.

6.3 The source for the collective reading: A single event

The proposal is that the ambiguity in the plural-subject construction, fluctuating between collective and distributive readings, characterizes all atom-predicates. The formula in (24) represents the truth conditions of *rec*-predicates with plural subjects:

$$(24) \quad \forall x \in A \exists e \exists y [(x \neq y) \wedge R_{\text{rec}}(e, x, y)]$$

This formula is underspecified regarding whether all members of set A participate in relation R_{rec} in the same event or in different events. It also remains underspecified regarding whether the other participant (y) is part of the set A denoted by the subject. In the distributive reading, each member of this set serves as the *rec*-er of a distinct event, and their respective *rec*-ed is not part of set A. The collective reading is a specific interpretation of the underspecified meaning, where all members of the set participate in the same event, and all participants in the *rec*-ed position are members of that set. Particularly in cases where the cardinality of set A is 2,²⁷ the outcome is an irreducibly symmetric event, as depicted in (25) (the existential quantifier binding the event variable has wide scope).

$$(25) \quad |A| = 2 \exists e \forall x \in A \exists y \in A [(x \neq y) \wedge R_{\text{rec}}(e, x, y)]$$

Since (25) entails (24), (25) is a specific reading of (24).

The ambiguity between a single-event reading and a plural-event reading is inherent in all atom predicates with a plural subject (cf. Lakoff & Peters 1969), as exemplified by (26):

- (26) John and Bill went to New York
 (a) John and Bill each went separately to New York
 (b) John and Bill went together to New York

²⁶ This direction aligns with Charnavel's (2015) proposal, introducing a silent underspecified argument for relational predicates in similar constructions.

²⁷ In scenarios involving more than two participants, not all may engage in symmetric relations within the same sub-event. For instance, with four people, two pairs could engage in *rec*-hugging within the same event, constituting a collective reading.

Any predicate with a plural subject permits either a distributive or a collective reading, unless the specific meaning of the predicate or the context precludes this possibility. Therefore, the collective and distributive readings of (6) do not entail different syntactic or lexical structures. According to this analysis, the meaning remains underspecified regarding the number of events and whether the *rec*-ed is part of the set denoted by the subject. Thus, *rec*-predicates are dyadic atom predicates rather than monadic set-predicates. Thus, what was previously considered the most basic use of these predicates, involving a plural subject with a collective reading, is actually a specific reading. This reading, generally available in sentences with plural subjects, indicates that all relations hold within the same event.

As per the methodology outlined in Section 2, a particular group of verbs forms these constructions. To account for the multifunctionality of these predicates (Stage Three), instances with plural subjects, interpreted as signifying symmetric events, represent a specific interpretation where symmetry applies (Stage Four). Thus, systematic conditions exist that lead to a symmetric interpretation (3), justifying the classification of these constructions as a strategy for expressing reciprocity.

7. Evidence for the analysis of the *rec*-predicates

This section serves to substantiate several assertions from the preceding one. Firstly, Section 7.1 demonstrates that sentences with plural subjects consistently acquire a 'symmetric' interpretation under specific conditions, even when the equivalent sentence with a singular subject lacks such a reading. This suggests that symmetry arises from a combination of specific grammatical features and contextual pragmatic effects. Secondly, Section 7.2 presents additional evidence supporting the claim that all instances of a particular *rec*-predicate share the same lexical entry, shedding light on the implicit argument's identity in sentences with plural subjects. Lastly, Section 7.3 further validates the assertion that *rec*-predicates function as atom-predicates.

7.1 Non-reciprocal verbs with a symmetric reading

The assertion that the collective reading emerges when all members of the subject-set participate in the same event, and all the *rec*-ers are members of that set as well, can also be illustrated with other groups of verbs.²⁸ While verbs like *hitnašek* 'kiss.REC' and *hitxabek* 'hug.REC' strongly favor the symmetric reading, irrespective of the subject being singular or plural, this inclination is less pronounced in other verbs. This supports the claim that the reciprocal reading is context-dependent.

In certain Modern Hebrew verbs, symmetry is implied with a plural subject but not with a singular one:

(27) a. *sar-e* *ha-likud* *ve-ha-avoda*

²⁸ This discussion aligns, to some extent, with Winter (2018), but diverges in approach. Winter posits that plural-subject sentences involve a distinct predicate taking a set as an argument.

minister-PL.of DEF-Likud and-DEF-Labor
hitnagxu ba-memšala

clash.REC.PST.3.PL in.DEF-government

'The ministers from the Likud party and from the Labor party clashed in the government.'

- b. *ben ha-šoft-im ha-xadaš-im*
among DEF-judge-M.PL DEF-new-M.PL

ba-elion yišxak amit še-be-avar
in.DEF-supreme.court Isaac Amit REL-in-past

hitnageax ba-maarexet
clash.in.REC.PST.3.M.SG in.DEF-system

'Among the new judges in the Supreme Court is Isaac Amit, who in the past clashed with the system'

This observation holds paramount importance for the approach advocated in this context, asserting that the basic predicate does not inherently imply symmetry. Symmetry, according to this perspective, arises when assuming a plural subject's participation in the same eventuality.

The preceding group of verbs might suggest that plurality alone implies symmetry. However, verbs like *hit'ahev* 'fall in love with' behave differently. They can be non-reciprocal with both singular (28a) and plural subjects (28b), although a symmetric reading is possible (28c). This contrast with verbs like *hitnašek* 'kiss', which imply symmetry even when plural and distributive.

- (28) a. *harel moyal hit'ahev ba-paam ha-rišon-a*
Harel Moyal fall.in.love.PST.3.M.SG in.DEF-time DEF-first-F
be-gil šnatayim
in-age two

'Harel Moyal fell in love for the first time at the age of two'

- b. *trini ve-suzana hitahavu, ve-atem?*
Trinny and-Susannah fall.in.love.PST.love.3.PL, and-2.PL
'Trinny and Susannah have fallen in love, what about you?'

- c. *helem ba-hitnaxalut, šte mitnaxal-ot hit'ahavu*
shock in.DEF-settlement, two.F settler-PL.F fall.in.love.PST.3.PL
ve-yaš'u me-ha-aron
and-exit.PST.3.PL from-DEF-closet

'Shock in the settlement, two female settlers have fallen in love and come out of the closet'

The last group includes verbs like *hitro'ea* 'hang out with, socialize' and *hityaded* 'befriend,' which typically exhibit a symmetric reading with plural subjects.

- (29) *ha-šnayim mitro'e-im ba-ya'ar šel roš ha-'ayin*
 DEF-two socialize.PES-M.PL in.DEF-forest of Rosh HaAyin
 'The two hang out in Rosh HaAyin forest.'⁹

Symmetric readings can also occur with a singular subject:

- (30) *'ani lo mevin lama ata mitro'ea*
 I NEG understand.PRS.M.SG why you socialize.M.SG
im ha-yeled hapirxax haze
 with DEF.child brat DEM.M.SG
 'I do not understand why you hang out with that brat of a boy.'⁹

However, with a singular subject, the meaning is often asymmetric or that the level of the participation in the relation may not be equal, even when the verb describes a relation between two humans.

- (31) *hu mitro'ea im ha-anašim ha-kicon-im*
 He socialize.PRS.M.SG with DEF-people DEF-extremist-M.PL
 'He hangs out with the extremists'

The relationship depicted in (31) is asymmetric; the extremists are considered dominant, and the subject is influenced by them, seeking their company. Contrastingly, in (32), with the positions of the arguments reversed, the meaning differs, requiring the "extremists" to be the ones interested in the social relation, while the person indicated by the comitative expression is more independent, attracting the attention of others for interaction.

- (32) *ha-'anašim ha-kicon-im mitro'e-im it-o*
 DEF-people DEF- extremist-M.PL hang.out.PRS-M.PL with-3.M.SG
 'The extremists hang out with him.'

In these instances, while symmetry, as defined in (3), is maintained, it may not be balanced equally in both directions. Only with a plural subject is there an implication that symmetry exists at the level of engagement to the same degree.

This evidence substantiates the claim that the symmetric reading in sentences with plural subjects is not intrinsic to the fundamental meaning of the predicate; instead, it arises from a combination of lexical, syntactic, and pragmatic factors, leading to an interpretation that all relations are established within the set denoted by the subject of the sentences.

The existing literature on *rec*-predicates concentrates on verbs like *hitnašek* 'kiss', commonly perceived as symmetric with both singular and plural subjects. However, as demonstrated earlier, this symmetry isn't universal, even for verbs like 'kiss' and 'hug.'²⁹ The data in this section reveals that the tendency for a symmetric reading, and whether it occurs consistently or only with plural subjects, varies across different verbs. A notable distinction emerges

²⁹ Winter (2018) concurs that *rec*-predicates lack inherent symmetry among participants but argues for its favored interpretation. Importantly, this preference is specific to singular-subject sentences, concerning the relationship between the subject (*rec*-er) and the referent of the oblique DP (*rec*-ed), and is restricted to certain verbs. However, it doesn't hold true for the selection between distributive and collective readings. Pragmatically, this ambiguity is contextually resolved without an automatic bias towards either reading.

between verbs that often entail symmetric events (with no sub-events) regardless of the subject's number and those where symmetry is more prevalent with plural subjects. Physical contact verbs fall into the former category, while social interaction verbs fall into the latter. This discrepancy is expected, given that physical contact inherently involves symmetry, whereas social interactions may be unidirectional. Further elaboration on this topic will be provided in Section 8.

Despite these differences, this paper proposes a unified analysis for all these verbs. It suggests that the collective reading in sentences with plural subjects is a specific case resulting from various factors. Exploring why each verb prompts a distinct salient interpretation will be addressed in the paper's final section.

7.2 *Rec*-predicates with focus-sensitive particles

The data presented thus far are consistent with three possible explanations for the availability of both distributive and collective readings:

- i. A syntactic distinction between the two readings involving distinct implicit arguments (23a-b).
- ii. One syntactic structure with an underspecified meaning (23b), influenced by pragmatic factors that lead to two possible interpretations.
- iii. Two distinct predicates: one for plural subjects, yielding the collective reading, and another for singular or plural subjects responsible for nonsymmetric readings and the distributive reading, respectively (Siloni 2012).

The preference for the first two options has been mainly aesthetic, assuming a theory with a single lexical entry is preferable. This subsection counters the option of two lexical entries and clarifies the identity of implicit arguments. To accomplish this, Bar-Asher Siegal's test (2020: 254-255) will be applied in a new context to demonstrate a case of underspecified meaning.

According to (ii), outlined in Section 6.3, *rec*-predicates with plural subjects are underspecified regarding the number of events and whether the *rec*-ed participant is part of the subject's set.³⁰ A collective reading represents a distinct scenario where all subject members participate exclusively in the same event with each other, making it a stronger interpretation which also entails the distributive reading. Consequently, in downward-entailing environments, the entailment should occur in the opposite direction. This prediction is indeed borne out:

(33) *ha-ylad-im* *ba-kita* *lo* *hitnašku* *af paam*
 DEF-child-M.PL in.DEF-class NEG kiss.REC.PST.PL never
 'The kids in the class never kissed'

When interpreted distributively, implying distinct events, the sentence suggests that the kids never kissed at any time. However, it also implies a collective reading, that the kids did not

³⁰ In examining classical cases of the distributive/collective distinction, Shwarzchild (1993) and Kratzer (2007) suggest that the relationship between readings is due to underspecification, while Heim (1994) favors an ambiguity approach. The discussion here aligns with similar foundational assumptions in this literature.

engage in a group kiss during a single event. In the positive sentence, only when interpreted as a collective reading involving reciprocal kissing within the group does it imply the distributive reading, signifying that everyone engaged in some reciprocal kissing. This inference does not hold in the opposite direction.

This assertion is substantiated by examining focus-sensitive particles. Such sentences, in fact, counter the idea of positing two distinct predicates for collective and distributive readings (option iii), as the semantics of sentences with focus-sensitive particles encompass both interpretations simultaneously. This duality is only plausible when assuming a single underspecified interpretation for these sentences (option ii). To grasp this claim, it is crucial to revisit the semantics of focus-sensitive particles, which broadly entails asserting a prejacent and negating its alternatives. Consider a sentence with *only*:

(34) Only Jeff ate an apple.

In broad terms, this sentence conveys two propositions: the prejacent (35a) and the exclusion (35b):³¹

- (35) a. Jeff ate an apple.
 b. Nobody other than Jeff ate an apple.

Consider an *only*-sentence featuring a *rec*-predicate and a plural subject with a collective reading:

(36) *mi-kol yalde ha-kita raq yoram*
 From-all child.PL.OF DEF-class only Yoram
ve-yael hitnašqu
 and-Yael kiss.REC.PST.PL
 'Of all the children of the class, only Yoram and Yael kissed.'

Notably, in this context, the sentence in (36) conveys two propositions:

- (37) a. Yoram and Yael *rec*-kissed each other.
 b. Of all the children in the class, nobody other than Yoram and Yael *rec*-kissed (anyone, even outside the class).

Even when the prejacent (37a) is linked to the strong interpretation, namely the collective reading, the proposition of exclusion in (37b) can only arise by negating the weak interpretation of (36), that is, the distributive reading.

While it may be perplexing that two different interpretations of a single sentence can coexist, the analysis of the semantics of *rec*-predicates, with the underspecified meaning (24), suggests that this is expected. The reinforcement of the positive sentence (the prejacent) takes place contextually by assuming that the sentence describes a singular event, and all *rec*-er

³¹ The specific relationship between (34) and (35a) is inconsequential for our purposes, having been analyzed as entailment (Atlas 1996), presupposition (Horn 1996), or implicature (van Rooij & Schulz 2007).

participants are also *rec*-eds in this event (37a). However, when negated, the basic underspecified interpretation is negated (assuming the weakest interpretation) resulting in (37b).

This observation also elucidates the nature of the implicit argument in *rec*-sentences. As outlined in Section 6.2 and repeated here, with plural subjects, two distinct implicit arguments are theoretically possible: a reciprocal anaphoric expression (23a) or an indefinite pronoun (23b):

- (23) a. *yoram ve-rina hitnašku (exad im ha-šeni)*
 Yoram and-Rina kiss.REC.PST.3.PL (one with DEF-second)
 'Yoram and Rina kissed (each other)'
- b. *yoram ve-rina hitnašku (im mišehu)*
 Yoram and-Rina kiss.REC.PST.3.PL (with someone)
 'Yoram and Rina kissed (someone)'

The collective reading can be derived in two ways:

- i. From the underlying structure in (23a), where symmetry is produced in a compositional manner.
- ii. From the underlying structure in (23b), where the semantics of the sentence remains underspecified, but pragmatic factors can motivate an interpretation involving a single event with only two participants – i.e., the symmetry reading.

The data in (36-37) supports the second option, as the positive preajcent sentence is interpreted collectively, and the negative sentence, negating all contextual alternatives, is interpreted distributively. This is only possible if both sentences share the same preajcent, achievable by assuming the implicit argument in (23b). The semantics of the exclusion proposition (23b) arises by assuming that the negation of (36) interacts with the weaker interpretation involving the underspecified implicit argument in (23b). The stronger interpretation of the proposition (37a), that they kissed each other, is achieved through pragmatic strengthening.

There is, however, reason to consider that (23a) is also occasionally available as the underlying structure in certain contexts. Consider (38):

- (38) *yoram ve-rina lo hitnašku kvar hamon zman*
 Yoram and-Rina NEG kiss.REC.PST.3.PL already much time
 'Yoram and Rina haven't kissed (each other) for ages'

This sentence can convey that Yoram and Rina haven't kissed *anyone* for a long time or, alternatively, that they did *rec*-kiss other people, but not each other. Winter (2018 n. 7) considers this as evidence for the ambiguity of all *rec*-predicates between two senses. However, a simpler explanation posits that, similar to other cases with implicit arguments, both the anaphoric expression (as in 23a) and the existentially-quantified pronoun (as in 23b) are available, with the context determining the choice between them (see Condoravdi & Gawron

1996). According to this analysis, the ambiguity is not linked to two lexical entries but to two underlying structures involving two different types of implicit arguments.³²

7.3 The distinction between atom- and set-predicates

Dimitriadis (2008a,b), Siloni (2012), and to some extent, Winter (2018) posit that *rec*-predicates belong to the broader class of symmetric predicates, which also encompasses inherently symmetric expressions like 'be similar,' 'be identical,' 'be next to.' These studies assume that all these predicates, including *rec*-predicates, take sets as their arguments. However, Section 3 proposed that *rec*-predicates differ from *sym*-predicates in that they take atoms, rather than sets, as their arguments. This section aims to further substantiate this claim by delving into Winter's (2002) typology of predicates.

Based on observations in Dowty (1986), Winter draws a sharp distinction between atom- and set-predicates, proposing the general principle in (39):

(39) The atom/set principle:

Denotations of lexical atom predicates range over atoms. Denotations of lexical set predicates range over sets of atoms. The classification of predicates (PRED) is determined according to their behavior in sentences like (40):

- (40) a. all the/no/at least two/many students PRED
 b. every/no/more than one/many a student PRED

The following terminology defines these two kinds of predicates:

Let PRED be a natural language predicate (verb, noun, or adjective). Assume the sentences in (40a) and the corresponding sentences in (40b) are equally acceptable and, if acceptable, are furthermore semantically equivalent, then PRED is called an **atom predicate**. If the respective sentences in (41a) and (41b) differ in either acceptability or truth-conditions then PRED is called **set predicate**.

For example, consider the following pairs:

- (41) a. All the students slept
 b. Every student slept

³² Similarly, consider the sentence:

<i>yoram ve-rina</i>	<i>hitnašku</i>	<i>ve-gam golda</i>	<i>ve-moran</i>
Yoram and-Rina	kiss.REC.PST.3.PL	and-also Golda	and-Moran

“Yoram and Rina kissed and so did Gola and Moran”.

This sentence tests for polysemy. If both interpretations must be of the same kind (collective or distributive), it indicates two distinct lexical entries.

When read as underspecified, the sentence can be true if Yoram and Rina kissed each other while Golda and Moran kissed other people. Hence, there's no necessity for two lexical entries. However, if the sentence is interpreted as specified for reciprocity, our analysis suggests the presence of an implicit reciprocal pronominal expression ("each other"). Due to ellipsis rules, the implicit argument of the second sentence must also be reciprocal. Therefore, this doesn't argue for ambiguity but rather for two underlying constructions with different implicit arguments.

- (42) a. *All the students are numerous
 b. *Every student is numerous
- (43) a. All the students met in the hall
 b. *Every student met in the hall

According to this classification, *sleep* and *numerous* are atom predicates, since (41a) and (41b) are both acceptable and are semantically equivalent, while (42a) and (42b) are equally unacceptable. *Meet*, on the other hand, is a set-predicate, since (43a) is acceptable but (43b) is not. This test can be adopted to Hebrew, by replacing “All the NP_{pl}” with “*kol* DEF-NP_{pl}”, and “Every NP_{sg}” with “*kol* NP_{sg}”. Thus, application of this test to the *sym*-predicate *zehe* 'be identical' indicates that it is indeed a set-predicate:

- (44) a. *kol ha-ylad-im zeh-im*
 all DEF-child-PL identical-PL.M
 'All children are identical'
- b. **kol yeled zehe*
 every child identical
 *'Every child is identical'

In this example, only the a-sentence is acceptable, suggesting that this predicate ranges over sets. However, when applied to the *rec*-predicates (45-46), this test indicates that, contrary to the assumptions of Dimitriadis (2008a,b), Siloni (2012), and Winter (2018), they are actually atom-predicates:

- (45) a. *kol ha-ylad-im hitnašku*
 all DEF.child-PL kiss.REC.PST.3.PL
 'All the children participated in a 'reciprocal' kissing'
- b. *kol yeled hitnašek*
 every child hug.REC.PST.3.M.SG
 'Every child participated in a 'reciprocal' kissing'
- (46) a. *kol ha-talmid-im hitvakxu*
 all DEF.student-PL argue.REC.PST.3.PL
 'All the students argued'
- b. *kol talmid hitvakeax*
 every student argue.REC.PST.3.M.SG
 'Every student argued'

Having established in the previous section that *rec*-predicates are not systematically associated with two lexical entries, it is possible now to state categorically that *rec*-predicates do not range over sets but over atoms. This implies that, unlike the assumption in Dimitriadis (2008a,b) and Siloni (2012), *rec*-predicates are not basic non-symmetric predicates that underwent a semantic/syntactic/lexical operation transforming them into *sym*-predicates. Instead, they belong to a distinct class of predicates, differing from *sym*-predicates in several ways:

- i. With a plural subject, *rec*-predicates allow a distributive reading (6ii), whereas *sym*-predicates do not. This difference arises from the fact that *sym*-predicates are set predicates, inherently taking a collective reading.
- ii. With a singular subject, *rec*-predicates permit a non-symmetric reading, unlike *sym*-predicates. This distinction is attributed to the fact that the latter denote inherently symmetric relations, one of the possible semantic features of predicates taking sets as their arguments. (According to Lakoff & Peters 1965, all such predicates involve an aspect of symmetry, but determining the validity of this claim is beyond the scope of this article).

In conclusion, *rec*-predicates, even in Hebrew, are not necessarily tied to specific morphology. Their argument structure in (16) and basic realization involve the *rec*-ed argument with an associative preposition, as seen in (7)-(8). This participant, as mentioned earlier, can remain implicit (20). Therefore, the defining factor for this construction is not the morphology but its appearance in such a syntactic structure (15) (Stage Two in the methodology detailed in Section 2).

In many instances, sentences like (7) are interpreted as symmetric, but this interpretation is not obligatory (8). In the plural (6), if the relation is contextually understood as holding between members of the set denoted by the subject, either in one event or subsequent events (e.g., delivering messages (Section 5.2)), symmetry also holds (6i). Thus, Section 7 introduced the fourth stage in the methodology for analyzing types of reciprocal constructions, explaining how constructions of this type function as a strategy for expressing reciprocity in specific contexts.

8. The meaning of *rec*-predicates and conclusions

8.1 Types of *rec*-predicates

In the discussions throughout the article, it has become apparent that *rec*-predicates vary significantly in expressing symmetric relations. Some inherently denote such relations, often with transitive counterparts introducing causative elements (Section 5.3). Others convey different degrees of the symmetric engagements, categorized into two types: those with symmetric sub-events and those without (Section 5.2). Additionally, certain verbs emphasize symmetric readings more with plural subjects, while others do so with both singular and plural subjects (Section 7.1). Thus, the inquiry into the factors behind these differences arises.

The subsequent discussion aims to highlight correlations between the mentioned semantic characteristics and other features of the same verbs. It provides preliminary explanations based on data collected in Agranovsky's (forthcoming) work on the morphology and meaning of verbs in Hebrew, revealing that Hebrew has 57 verbs falling under the category of *rec*-predicates, which can be classified into four groups based on their semantics (see appendix for the list of verbs and their characterizations).

Type I: This group encompasses telic verbs indicating a transition into an inherently symmetric relation (ISR), and the meaning can be schematized as follows:

X enters into a state of R_{ISR} with Y

These verbs involve either a social aspect (e.g., *hitxaten* ‘marry’) or a physical aspect (e.g., *hitxaber* ‘unite’), with many having both social and physical meanings (e.g., *hištadex* ‘match/staple’). Among the 21 verbs in this group, 19 also have a transitive verb counterpart introducing an additional participant denoting the cause of the R_{ISR} (e.g., *xiten* ‘marry someone(s)’, *xiber* ‘unite something’, and *šidex* ‘match/staple something’,) as discussed in Section 5.3.

The other three groups involve different type of activities:

Type II:

This group of verbs comprises activities that involve physical contact between two objects. The meaning of these verbs can be schematized as follows:

X is involved in $R_{\text{manner of certain physical contact}}$ with Y

These verbs describe continuous physical activities entailing contact between two bodies, conveying either positive emotions (e.g., *hitxabek* ‘hug.REC’) or negative ones (e.g., *hitkotet* ‘quarrel’). Some verbs specifically denote the physical contact itself (e.g., *hitxakex* ‘rub against each other’). They characterize an activity involving a specific manner of physical contact, often with some duration, where Y is also involved in the event by reciprocating or accepting it willingly (see Kruitwagen et al. 2017 for experimental data).

As designated by Dimitriadis (2008a,b), these verbs are irreducibly symmetric predicates, not representing a set of uni-directional sub-events (i.e., symmetry across events). Both arguments must participate in any event described by the predicate. The physical contact implied by these verbs entails the involvement of both parties in the same activity. Consequently, it is not feasible to assert that only X is part of the event, leaving Y out, since the physical contact necessitates the participation of both parties and precludes the division into sub-events.

Type III: This category comprises activities involving social interactions between two agents. The meaning of these verbs can be outlined as follows:

X is involved in $R_{\text{manner of certain social contact}}$ with Y

The seven verbs in this group describe various social interactions, including *hityaded* ‘make friends’. Some of these verbs have both physical and social meanings, such as *hitkotet* ‘quarrel’, which can depict both a physical fight and an interaction where two people insult each other.

Notably, as discussed in Section 7.1, verbs in this group exhibit a correlation where the symmetric interpretation is more prominent with plural subjects, while the uni-directional interpretation is more salient with singular subjects.

The prominence of uni-directionality in events with singular subjects seems correlated with the fact that these verbs denote social relations. In social interactions, one side may perceive the interaction while the other remains oblivious, allowing for uni-directionality. This differs from physical interactions, where the occurrence is objective and not dependent on individual perception. In fact, determining how to break down the denotations of verbs into sub-events when a symmetric relation is present is not straightforward. It's unclear to what extent both arguments must participate in any event described by the predicate, a requirement that appears relevant primarily when physical contact is involved.

Type IV: This category encompasses activities involving the delivery of messages, which can be executed in various manners and involve different types of communication. The meaning of the verbs used for such activities can be schematized as follows:

X deliver.message _{manner} with y
--

Verbs falling into this category share the common feature of indicating the delivery of a message. In their collective interpretations, these verbs describe bi-directional communication between two agents. Moreover, these verbs can specify the medium, as seen in the case of the verb *čotet* ‘chat’, or the manner of communication, as observed with the verb *hitlaxšěš* ‘whisper.REC’. Some verbs provide details about the type of content being communicated, such as *hitpalmes* ‘polemicize’.

Even with collective interpretations, these verbs' event denotations can still be broken down into unidirectional sub-events, as discussed in Section 5.2. Each agent delivers their message separately to the other, challenging the literature's claim that both arguments in *rec*-predicates must participate in every sub-event. Our data suggest this claim applies only to specific verbs involving physical contact, not universally to all *rec*-predicates. Thus, the restriction to symmetric irreducibility in certain verbs stems from the type of events they describe, particularly those involving physical interaction.

Type IV comprises 14 verbs, exhibiting peculiar characteristics: Notably, 7 of these verbs have only one occurrence of their roots (cf. Section 5.1), while 4 are not associated with stems typically used in the middle voice (Section 5.4.). Additionally, 2 verbs derived from the same root as the communication verb carry different meanings (e.g., *hitnaceax* ‘argue’ vs. *niceax* ‘win’. Lastly, for the 5 verbs sharing the same root with other transitive verbs, the correspondent is not an argument of the predicate (as defined in (16)). Examples include *dan* ‘judge’ vs. *hitdayen* ‘discuss’ and *katav* ‘write’ vs. *hitkatev* ‘correspond’ (as discussed in Section 5.2.).

A connection seems to exist between these observations: the absence of a clear unidirectional transitive counterpart for these verbs appears linked to their denotation of a specific type of communication, where each sub-event is inherently unidirectional. Consequently, having another verb derived from the same root that describes the same unidirectional action is unexpected.

In summary, four types of *rec*-predicates have been identified, with observed correlations between these semantic characteristics and the manner in which they articulate symmetric relations, as outlined in Table 4:

The type of <i>rec</i> -predicates.	Characteristics of the predicates
I X enter into a state of R_{isr} with Y	Entailment of R_{isr} The potential for an active counterpart with an additional causer argument.
II X is involved in $R_{\text{manner of certain physical contact}}$ with Y	No entailment of symmetry Symmetry is salient for both singular and plural subjects. The denotation of the event cannot be divided into unidirectional sub-events. The availability of an active counterpart denoting a somewhat similar unidirectional activity.
III X is involved in $R_{\text{manner of certain social contact}}$ with Y	No entailment of symmetry Symmetry is salient only for plural subjects. Does not have an active counterpart.
IV X deliver.message _{manner} with y	No entailment of symmetry Symmetry is salient for both singular and plural subjects. The denotation of the event can be divided into unidirectional sub-events. The availability of an active counterpart, but the correspondent is not an argument of the predicate.

Table 4: four types of *rec*-predicates

8.3 Inherently Symmetric Predicates

Sections 3 and 6-7 argues for the existence of two predicate types: *sym*-predicates and *rec*-predicates. These types differ in two ways. Firstly, at the AS level, *sym*-predicates take sets as their arguments, while *rec*-predicates take atoms as their arguments. Secondly, at the semantic level, symmetry is inherent in the meaning of *sym*-predicates but not entailed by the meaning of *rec*-predicates.

However, this distinction requires nuance, as Type I of *rec*-predicates incorporates ISR as part of its meaning. Despite this, it still falls under *rec*-predicates because it allows for a distributive reading with a plural subject. Moreover, they take atoms as their arguments as they pass the demarcation test to belong to this predicate type (Section 7.3). Thus, the distinction between *sym*-predicates and *rec*-predicates does not solely rely on semantic characterization. Accordingly, the definitions for these predicates need to be updated as follows:

***Sym*-predicates take sets as arguments (thus, lacking a distributive reading), and symmetry is inherent in their meaning (precluding a non-symmetric interpretation).**

***Rec*-predicates take atoms as arguments (permitting a distributive reading), and symmetry is not intrinsically part of their meaning unless they denote inherently symmetric relations.**

8.4 Concluding remarks

In revisiting Stage Four of the reciprocity typology, outlined in Section 2, the examination focuses on the relationship between the components of the verbal construction and the occasionally denoted symmetric relation. The analysis indicates that *rec*-predicates do not express symmetry through grammatical derivation, whether lexical or morphological. Instead, they convey a broader, underspecified meaning, interpreted as symmetric in specific contexts.

Symmetry in this analysis is tied to the events described by the predicates and can be derived in two ways: by signifying events portraying an entrance to an ISR or by portraying a situation where symmetry is maintained, within a single event or across multiple events, contingent on the context. In the latter case, all verbal arguments denote participants in the same event, and symmetry is not implied by the verbs' meanings but by the context in which they are used (the specification to a single event, or to a series of events when communication is involved).

While the discussions have primarily drawn on Hebrew data in this paper, prior studies have demonstrated that Hebrew shares many similarities with other languages. This suggests that the conclusions can be applied to other languages as well.

Finally, this paper contends that the verbal strategy for expressing reciprocity in Hebrew does not denote symmetry. Instead, *rec*-predicates are argued to possess a distributive reading that remains underspecified regarding the number of events. It is posited that when contextual cues specify singularity of events, a symmetric meaning is conveyed. Bar-Asher Siegal (2020, chapters 7-8) introduces the NP-strategy for expressing reciprocity (see example (2), in the

introduction) and proposed that it denotes *unspecified relations* among members of a set. These constructions are underspecified regarding the number of members in the set participating in each argument position with the other members of the set. In certain contexts, the meaning is semantically strengthened to convey symmetry. While there exists some conceptual similarity between the two analyses, they differ in terms of what is underspecified and the factors and the mechanism leading to strengthening.

Furthermore, the two analyses do not argue for the absence of other constructions denoting symmetry. Bar-Asher Siegal (2020) contends that the adverbial construction (introduced in Chapter 5 of this book) entails symmetry in all contexts. Both studies are essential components of a larger project that seeks to explore the degree to which natural languages employ structures to express symmetry and how symmetry is conveyed in constructions that do not inherently denote symmetry.

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Supplementary file

An XL file, containing a comprehensive list of reciprocal verbs (*rec*-predicates) in Hebrew from the Agranovsky (forthcoming) dataset along with a characterization of their properties, is available as an appendix to this paper at the following link: [LINK].

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